Operational Plan of the Commission for Environmental Cooperation 2015–2016

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This Operational Plan was approved by the Parties to the North American Agreement on Environmental Cooperation.

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1 Introduction and Context

In 2014, the Council of the Commission for Environmental Cooperation (CEC)—the federal environment ministers of Canada, Mexico and the United States (the "Parties")—met to mark the 20th anniversary of the CEC and set its agenda for the next five years. For 2015–2020, they endorsed a new focus on three strategic priorities: climate change mitigation and adaptation; green growth; and sustainable communities and ecosystems. The Council also announced three cross-cutting themes, taking into account global, regional and local challenges, emerging issues and common goals. These priorities and themes, set forth in the CEC's new Strategic Plan 2015–2020, build on 21 years of positive cooperation and successes accomplished through the CEC and are in line with commitments made by the North American leaders to address pressing environmental challenges that require coordinated regional and international responses.

The Council further highlighted the valuable contribution that local and indigenous communities can offer to environmental management activities in the three countries. It recognized the importance of preserving the traditional ecological knowledge and practices of these communities and expressed its intention to engage with them across North America to enhance the understanding of environmental issues and make more effective and inclusive environmental management decisions.

The CEC's two-year Operational Plan for 2015–2016 describes CEC activities to be undertaken in the next two years, including a set of trilateral projects proposed under strategic priorities for 2015–2020 to protect and enhance the North American environment. By working together to design trilateral initiatives that address each priority and cross-cutting theme, government experts from the three countries developed 16 projects as part of the Cooperative Work Program described in this document. These projects were also shaped by the advice and input of the public through the Joint Public Advisory Committee and the Secretariat's expertise. They will be carried out over a two-year period, starting July 2015.

In addition, the North American Partnership for Environmental Community Action (NAPECA) will continue in 2015–2016 to fund community-based projects engaging tribal nations/indigenous communities, nongovernmental organizations, and other relevant stakeholders to support the delivery of CEC priorities and strengthen the opportunities for effective cooperative work.

2 2015–2016 Budget

The CEC's 2015 and 2016 budgets are based on a total of US$9 million annually, of which each Party contributes an equal share, taking into account the allocation of unspent funds from previous years. The operational budget is complemented by staff time, expertise, and travel support, as well as other in-kind contributions from the Parties and project partners.

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Commission for Environmental Cooperation
Budgets for 2015 and 2016

(in thousands of Canadian dollars)

Description	2015 Budget	% of Total	2016 Budget	% of Total
REVENUES				
Parties' Contributions	8,338.5		8,338.5	
(2015 - 2016 exchange rate US$1.09/C$)				
Carry Over of Unspent Contributions from Previous Years	912.5		1,787.5	
TOTAL REVENUES	**9,251.0**		**10,126.0**	
EXPENSES				
Cooperative Work Program				
Projects	2,520.0		3,170.0	
Work Program Salaries, Benefits and Professional Development	1,407.4		1,437.6	
North American Partnership for Environmental Community Action (NAPECA)	725.0		600.0	
Tracking Pollutant Releases and Transfers in North America (North American PRTR Project)	150.0		150.0	
Support and Maintenance of the North American Environmental Atlas, North American Land Cover Monitoring System, and Online Interactive Informational Platform on Climate Change	55.0		55.0	
Mexico Liaison Office	211.0		211.0	
Managing CEC Environmental Information	81.0		81.0	
Monitoring, Evaluation and Reporting	80.0		80.0	
	5,229.4	56.5%	5,784.6	57.1%
Secretariat Report (Article 13)	0.0	0.0%	180.0	1.8%
Submissions on Enforcement Matters (Articles 14 & 15)*	691.1	7.5%	701.0	6.9%
Council Support*	321.0	3.5%	323.0	3.2%
JPAC Support*	503.2	5.4%	506.2	5.0%
Communications*	522.9	5.7%	531.0	5.2%
Administration & Management				
Executive Director's Office	65.0		65.0	
External Administrative Support	195.0		195.0	
(insurance, audit, fiscal expertise, banking, legal)				
Relocation/Orientation, Recruitment	113.8		183.8	
Operating Expenses	742.0		770.0	
(telecommunications, rent, operating equipment, office supplies)				
Administration & Management Salaries and Professional Development	867.7		886.3	
	1,983.5	21.4%	2,100.1	20.7%
TOTAL EXPENSES	**9,251.0**	**100.00%**	**10,126.0**	**100.00%**

*These components include related salaries, benefits and professional development.

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CEC Operational Plan 2015-2016: Project Budgets				
Project Number	Project Title	Budget Year 1 (C$)	Budget Year 2 (C$)	Total Budget for 2 Years (C$)
	CLIMATE CHANGE MITIGATION AND ADAPTATION			
1	Integrated Modeling and Assessment of Climate Change Mitigation Options in the North American Forest Sector	180,000	180,000	**360,000**
2	Helping North American Communities Adapt to Climate Change: A Pilot Syndromic Surveillance System for Extreme Heat	205,000	195,000	**400,000**
3	North American Initiative on Food Waste Reduction and Recovery	230,000	230,000	**460,000**
4	North American Initiative on Organic Waste Diversion and Processing	120,000	245,000	**365,000**
5	North American Blue Carbon: Next Steps in Science for Policy	305,000	315,000	**620,000**
	Total for Climate Change	**1,040,000**	**1,165,000**	**2,205,000**
	GREEN GROWTH			
6	Reducing Emissions from Goods Movement via Maritime Transportation in North America – Phase II	115,000	135,000	**250,000**
7	Enhancing North American Enforcement of IMO Maritime Fuel Sulfur Limits	125,000	125,000	**250,000**
8	Accelerating Adoption of ISO 50001 and Superior Energy Performance (SEP) Program Certifications in North America	80,000	220,000	**300,000**
9	Strengthening Conservation and Sustainable Production of Selected CITES' Appendix II Species in North America	65,000	235,000	**300,000**
10	Greening of Chemicals Management in North America	165,000	360,000	**525,000**
	Total for Green Growth	**550,000**	**1,075,000**	**1,625,000**
	SUSTAINABLE COMMUNITIES AND ECOSYSTEMS			
11	Arctic Migratory Birds Initiative - the Americas' Flyway Action Plan	230,000	230,000	**460,000**
12	Engaging Farmers and Other Landowners to Support Monarch Butterfly and Pollinator Conservation	150,000	150,000	**300,000**
13	Monarch Butterfly Flyway: Communication, Participatory Conservation, and Education Programs Throughout the Migratory Route	135,000	165,000	**300,000**
14	Local Environmental Observer Network	125,000	125,000	**250,000**
15	Using Ecosystem Function and Traditional Ecological Knowledge together to Build Resilience and Adapt to Climate Change in North America	150,000	100,000	**250,000**
16	Marine Protected Areas: Strengthening Management Effectiveness and Supporting Coastal Community Resilience	140,000	160,000	**300,000**
	Total for Sustainable Communities and Ecosystems	**930,000**	**930,000**	**1,860,000**
	TOTAL	**2,520,000**	**3,170,000**	**5,690,000**

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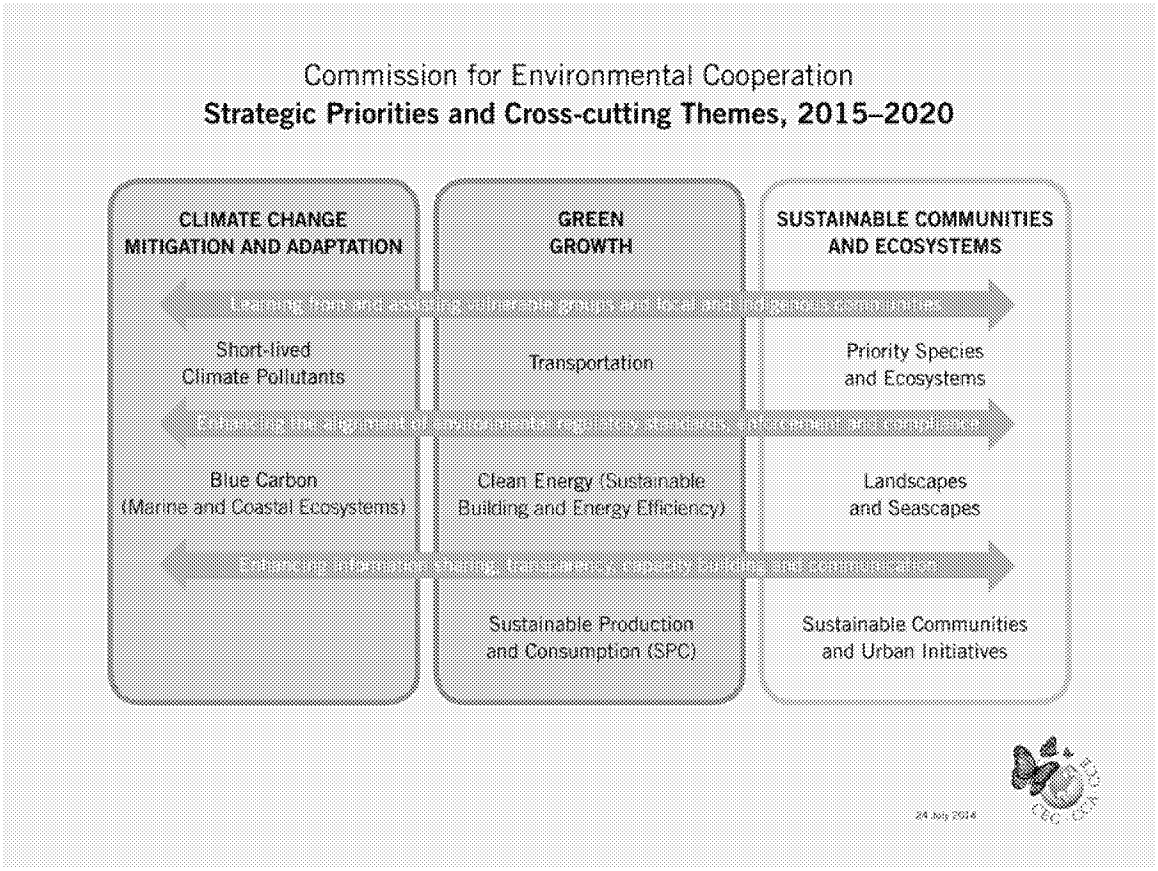
3 Cooperative Work Program

3.1 Strategic Framework

The trinational projects and other initiatives presented in this Operational Plan are the first set of two-year projects and initiatives that address the strategic priorities and cross-cutting themes described in the CEC's 2015–2020 Strategic Plan (Figure 1 and Appendix A). The CEC's Council provides guidance and direction to its government officials and experts to implement these projects and initiatives with the technical, administrative and operational support of the CEC Secretariat. Throughout implementation of these projects, the Council and Secretariat consult with the CEC's Joint Public Advisory Committee and stakeholders on an ongoing basis.

Figure 1 Strategic Priorities and Cross-cutting Themes 2015–2020



3.2 Projects 2015–2016

The Council approved 16 projects for 2015–2016 to support the strategic priorities and cross-cutting themes shown in Figure 1. Summaries of these projects are found below. Detailed project descriptions, including implementation tasks and budgets, can be found in Appendix B.

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3.2.1 Climate Change Mitigation and Adaptation

Integrated Modeling and Assessment of Climate Change Mitigation Options in the North American Forest Sector

The forest sector is expected to play an important role in domestic greenhouse gas mitigation portfolios in all three countries. This project will examine forest sector mitigation options to meet national objectives for greenhouse gas emission reductions in selected landscapes in Canada, Mexico and the United States. It will help quantify the impacts of various mitigation options on the greenhouse gas balance and consider how the data and tools developed for carbon assessment might be used to support vulnerability assessments and adaptation responses.

Helping North America Communities Adapt to Climate Change: A Pilot Syndormic Surveillance System for Extreme Heat Events

The main goal of this project is to develop an operational, real-time syndromic surveillance system for extreme heat events (EHEs) in three selected at-risk communities in Canada, Mexico and the United States and to highlight best practices and lessons learned on developing such a system. Extreme heat has been identified by several international organizations as an emerging environmental health risk in North America as it is expected that EHEs will significantly increase in intensity, duration and frequency by the end of this century.

North American Initiative on Food Waste Reduction and Recovery

In Canada, Mexico and the United States, an inordinate amount of food waste is disposed of in landfills, where it is decomposed by bacteria under anaerobic conditions, contributing to the formation and release of methane gas—a short-lived climate pollutant and greenhouse gas that is over 20 times more potent than carbon dioxide and has an atmospheric lifetime of about 12 years. The goal of this project is to enhance the capacity in the three countries for reducing the disposal of food waste in landfills by exploring opportunities to achieve food waste reduction and recovery within relevant North American industry, commercial and institutional sectors.

North American Initiative on Organic Waste Diversion and Processing

The goal of this project is to identify barriers, opportunities and solutions related to increasing organic waste diversion and processing capacity in North America. The project will focus on organic waste collection/segregation and organic waste processing. In all three countries, organic waste represents a significant component of the waste stream that can be diverted from landfills to other waste management approaches such as composting, anaerobic digestion, and other organic waste processes. This will contribute to significant reductions in short-lived climate pollutants such as methane, which impact human health and air quality in addition to contributing to climate change.

North American Blue Carbon: Next Steps in Science for Policy

Understanding the current and future roles of coastal/marine ecosystems in national greenhouse gas budgets in North America, including the impacts of management and climate change, is required in order to inform sustainable management of carbon sinks in these ecosystems. This project builds on activities conducted under the CEC's 2013–2014 project work and contributes to other international initiatives related to greenhouse gas accounting and to climate change adaptation and mitigation. It aims at refining the methodologies and protocols for measuring and mapping blue carbon habitats in North

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America to help the three countries develop and apply conservation and restoration approaches for promoting carbon sequestration in coastal and marine ecosystems.

3.2.2 Green Growth

Reducing Emissions from Goods Movement via Maritime Transportation in North America (Phase II)

Utilizing data models from the CEC's 2013–2014 project work to emphasize the air quality, public health, environmental and ecosystem benefits of reducing maritime shipping emissions, this project will showcase technologies and policies to promote clean and efficient maritime shipping. The primary goal of this project is to facilitate the establishment and implementation of an Emission Control Area (ECA) in Mexico, adjacent to the existing US-Canada ECA and thus establishing a "truly North American ECA." This will be accomplished by providing technical support and information needed to establish and implement an ECA, showcasing best practices for reducing ship emissions, including the use of alternative fuels such as natural gas, and documenting the emissions reductions achieved.

Enhancing North American Enforcement of the IMO Maritime Fuel Sulfur Limits

Maritime transport is a global industry, and North America has extensive maritime trade flows, both internally and with the rest of the world. The goal of this project is to enhance North American capacity to assess compliance with, and enforce as appropriate, the International Maritime Organization's fuel sulfur standards, particularly those applicable in Emission Control Areas (ECAs). The Parties are working through the CEC to help Mexico formally establish an ECA in Mexican waters.

Accelerating Adoption of ISO 50001 and Superior Energy Performance (SEP) Program Certifications in North America

The goal of this project is to position ISO 50001 and the Superior Energy Performance program (SEP) as key mechanisms for reducing greenhouse gas emissions and improving energy efficiency in the industrial and commercial sectors in North America. The project will help grow the workforce needed to implement these mechanisms in Canada, Mexico, and the United States, by demonstrating their economic and environmental benefits.

Strengthening Conservation and Sustainable Production of Selected CITES' Appendix II Species in North America

This project will promote legal, sustainable and traceable trade of selected regional species that are listed in CITES' Appendix II, through: 1) the identification and prioritization of highly traded Appendix II species; followed by a comprehensive trade analysis aimed at identifying challenges and opportunities for improving their sustainable trade; and 2) the establishment and launch of action plans to improve and strengthen regional collaboration and information exchange on selected Appendix II species, in areas such as their identification, their source and purpose codes, and any non-detriment findings and their links with conservation, sustainable use, and development opportunities for indigenous and local communities.

Greening of Chemicals Management in North America

This project aims to address two important aspects of chemicals management in North America pertaining to trade in chemicals and their use in products: 1) enhancing the

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alignment of North American trade statistics on elemental mercury and mercury-containing products, to assess the progress of the implementation of the Minamata Convention on Mercury; and 2) furthering the understanding of the migration of chemicals from manufactured items and subsequent human exposure to them and/or to their releases to the environment.

3.2.3 Sustainable Communities and Ecosystems

Arctic Migratory Birds Initiative (AMBI) – the Americas' Flyway Action Plan

The goal of the Arctic Migratory Birds Initiative is to improve the conservation status of migratory birds that breed in the Arctic. The majority of North American Arctic-breeding species migrate through, or winter in, Canada, Mexico, and the United States. Many of these species are endangered. By partnering with the Western Hemisphere Shorebird Reserve Network, a proven, community-based conservation effort, this project aims to improve conservation outcomes for at-risk shorebirds by informing, engaging and connecting communities in the three countries that share responsibility for their well-being.

Engaging Farmers and Other Landowners to Support Monarch Butterfly and Pollinator Conservation

The overarching goal of this project is to promote habitat restoration and enhancement in key breeding grounds and migration corridors of the monarch butterfly in Canada, Mexico, and the United States. As much of the breeding habitat loss has been in agricultural fields, this project will reach out to agriculture communities, organizations, and agencies in all three countries to provide practical, tested guidance about how to create and maintain monarch-friendly restoration plantings. This will also contribute to the conservation of other native pollinators on land under agricultural production.

Monarch Butterfly Flyway: Communication, participatory conservation, and education programs throughout the migratory route

The monarch butterfly is facing serious challenges that need to be studied simultaneously along its migratory path in Canada, Mexico and the United States. Outreach and awareness issues have been identified in the CEC's 2008 North American Monarch Conservation Plan as priority objectives to preserve this important migratory species. This project will develop a trilateral communications strategy, as well as foster citizen- and local community–based initiatives and educational programs that will disseminate information on the monarch's migration to all levels of society, and have a positive impact on the preservation of key breeding sites and vital migratory habitat for this symbolic species.

Local Environmental Observer Network (LEO)

With climate change expected to impact both the environment and the health of regional populations, it is important that communities have the capacity to monitor, respond to, and adapt themselves to these challenges in a timely manner. The goal of this project is to introduce and expand the Local Environmental Observer (LEO) Network originating in Alaska to Canada and Mexico. The project will assist partners in identifying climate change–related impacts in the focus regions, along with enhancing dialogue on the value of local observations, the health and environmental effects of climate change, and strategies for mitigation and adaptation.

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Using Ecosystem Function and Tribal Ecological Knowledge together to Build Resilience and Adapt to Climate Change over North America

The goal of this project is to share tools that are available to indigenous communities in the three countries, and to pilot new ones, to assess ecosystem vulnerability, and to demonstrate and test the concepts of integrated riparian and/or water catchment management. The people and agencies engaged in this project will gain experience from hands-on application of such tools. This will enable them to expand this application to provide support to other indigenous and local communities located within water catchments and riparian areas in need.

Marine Protected Areas: Strengthening Management Effectiveness and Supporting Coastal Community Resilience

The project will develop a North American approach to marine protected area (MPA) management effectiveness and coastal community resilience, building on existing efforts within the three countries and taking into account climate and other related pressures and their impacts on species, ecosystems, and people. This conservation approach recognizes the critical role that MPAs can play in helping to sustain the benefits that these special places provide to indigenous and local economies and communities, while recognizing the critical role of sustainable economic activities in helping to maintain and restore species and ecosystems. This project will promote conservation of marine biodiversity and economic prosperity of coastal communities by advancing best management practices for the ecologically sustainable management of marine protected areas.

3.3 Other Initiatives

The Council has also approved 2015–2016 work on other trinational initiatives supported by the CEC. These include:

Pollutant Releases and Transfers: Collaboration on tracking pollutant releases and transfers in North America. This ongoing, core initiative of the CEC involves the compilation, presentation, and analysis of data and information through the CEC's *Taking Stock* report and online, searchable database—with the objectives of promoting increased access to and understanding of information about the sources, amounts and management of toxic contaminants from industrial activities in North America, and the use of this information for the development of sound pollution reduction initiatives across the region. Fundamental to the achievement of these objectives is the trilateral collaboration under the updated *Action Plan to Enhance the Comparability of Pollutant Release and Transfer Registers in North America*, the recommendations of which are expected to be implemented during this operational plan.

North American Environmental Atlas and Land Cover: Support for the maintenance and addition of new maps layers and land cover products in the North American Environmental Atlas.

North American Portal on Climate Pollutants: Support for the maintenance and updating of the North American Portal on Climate Pollutants—an online tool that compiles greenhouse gas inventories for the three countries.

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3.4 North American Partnership for Environmental Community Action (NAPECA)

For 2015–2016, the Council will continue to complement trilateral projects and initiatives through grant support to community-based projects under the North American Partnership for Environmental Community Action (NAPECA).

4 Secretariat Reports

Article 13 of the North American Agreement on Environmental Cooperation (NAAEC) gives the Secretariat authority to prepare reports on important environmental issues within the scope of the strategic priorities and present them to the governments and people of Canada, Mexico, and the United States. The Secretariat may obtain the assistance of independent experts to assist in the preparation of such a report.

For a complete list and more information on these reports, please go to <http://www.cec.org/Page.asp?PageID=1246&SiteNodeID=332>.

5 Submissions on Enforcement Matters Process

The Submissions on Enforcement Matters (SEM) process enables the CEC Secretariat to consider citizen submissions on matters of effective enforcement of domestic environmental law in Canada, Mexico and the United States. For 2015–2016, the CEC will continue to advance public understanding of the SEM process by making the factual records more accessible to the public and expanding its outreach efforts.

The SEM budget covers the processing of submissions, from their receipt through possible development and publication of factual records and activities to promote the process. Information on the SEM process is available at: <www.cec.org/citizen>.

6 Institutional Support

The CEC is composed of the Council, a Secretariat and a Joint Public Advisory Committee (JPAC), which work for the benefit of effective regional collaboration among the NAAEC Parties on the environment.

6.1 Council

The Council is the CEC's governing body and comprises cabinet-level or equivalent representatives of each country. It approves and oversees the implementation of a trilateral work program by officials and experts of each of the three Parties. It also holds an annual public meeting for the purpose of making decisions and developing recommendations on matters within the scope of the North American Agreement on Environmental Cooperation NAAEC.

6.2 Secretariat

The Secretariat provides technical, administrative and operational support to Council and carries out the work in response to priorities identified by Council to support its experts' activities. Headed by an executive director, the Secretariat has an expert and highly motivated staff of 44 people, drawn from each of the CEC's three countries.

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Programs, communications, administration and general service staff provide support integral to implementation of the cooperative work program and institutional objectives.

The CEC Secretariat is headquartered in Montreal, with a regional liaison office in Mexico City. The Mexico liaison office is engaged in facilitating CEC's work and environmental stakeholders in Mexico.

6.3 Joint Public Advisory Committee

JPAC, composed of five citizen volunteers from each country, may advise the Council on any matter within the scope of the Agreement or its implementation and further elaboration. It may also perform other functions as the Council may direct. For more information on JPAC meetings and activities, see <http: //www.cec.org/jpac>.

7 Communications

The CEC endeavors to reach the widest possible audience in an efficient and cost-effective manner. This includes developing specific communication actions, CEC-wide messages, and outreach opportunities for Secretariat staff, as well as for government representatives, JPAC members and CEC partners. Messages and opportunities reflect new goals, products and audiences outlined in this two-year Operational Plan. In addition, all publications are made available in digital formats for online reading or download without cost from the CEC's website. Publications are only printed upon request or as part of distribution strategies developed to ensure that groups with limited Internet or computer resources can access CEC information.

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APPENDIX A: CEC Strategic Plan 2015–2020

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APPENDIX B: 2015–2016 Project Descriptions

CLIMATE CHANGE MITIGATION AND ADAPTATION

1 Integrated Modeling and Assessment of Climate Change Mitigation Options in the North American Forest Sector
2 Helping North American Communities Adapt to Climate Change: A Pilot Syndromic Surveillance System for Extreme Heat
3 North American Initiative on Food Waste Reduction and Recovery
4 North American Initiative on Organic Waste Diversion and Processing
5 North American Blue Carbon: Next Steps in Science for Policy

GREEN GROWTH

6 Reducing Emissions from Goods Movement via Maritime Transportation in North America – Phase II
7 Enhancing North American Enforcement of IMO Maritime Fuel Sulfur Limits
8 Accelerating Adoption of ISO 50001 and Superior Energy Performance (SEP) Program Certifications in North America
9 Strengthening Conservation and Sustainable Production of Selected CITES' Appendix II Species in North America
10 Greening of Chemicals Management in North America

SUSTAINABLE COMMUNITIES AND ECOSYSTEMS

11 Arctic Migratory Birds Initiative - the Americas' Flyway Action Plan
12 Engaging Farmers and Other Landowners to Support Monarch Butterfly and Pollinator Conservation
13 Monarch Butterfly Flyway: Communication, Participatory Conservation, and Education Programs Throughout the Migratory Route
14 Local Environmental Observer Network
15 Using Ecosystem Function and Traditional Ecological Knowledge together to Build Resilience and Adapt to Climate Change in North America
16 Marine Protected Areas: Strengthening Management Effectiveness and Supporting Coastal Community Resilience

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Project 1: Integrated Modeling and Assessment of Climate Change Mitigation Options in the North American Forest Sector	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$360,000 **Year 1: C$180,000** **Year 2: C$180,000**	

Strategic Priority/Subtheme

- Climate Change Mitigation and Adaptation

The forest sector throughout North America is expected to be a major contributor to meeting domestic targets for reductions of greenhouse gas (GHG) emissions. This project will provide policy-relevant scientific information on climate change mitigation options in the forest sector by evaluating and assessing their impacts on GHG balances. Such options include improvements in forest and land management, reduction of deforestation and forest degradation, enhancement and conservation of forest carbon stocks, carbon storage in harvested wood products, provision of biofuels, and the benefits of displacing high-emission products like concrete and steel with harvested wood products. National and regional circumstances, including forest conditions and drivers of GHG emissions, differ among the three countries and the CEC will provide the mechanism to maintain the trilateral focus and coordination among the Forest Services of the three countries. This coordination will enable the project team to identify and analyze the most efficient GHG mitigation options and improve understanding about regional differences between the available mitigation options and their mitigation potentials. If implemented, they can make significant long-term contributions to reducing GHG emissions in each country.

The forest and blue carbon projects of the CEC have similar objectives and have already started to coordinate activities regarding mangrove forests. Some of the carbon accumulating in aquatic systems originates from upstream land ecosystems, and their management, land use and levels of disturbance can affect carbon accumulation rates in blue carbon ecosystems. Both projects will create opportunities in the next two years for further cooperation and synergies among the two related land and aquatic sectors.

How will this project address the cross-cutting themes?

Learning from and assisting vulnerable groups and indigenous communities. The implementation of forest sector mitigation options, including enhanced forest management, silviculture and protection efforts aimed at achieving forest sector climate mitigation benefits can create additional benefits particularly in rural communities throughout North America. For example, reducing deforestation and forest degradation, if well implemented, can improve the livelihoods of vulnerable groups and indigenous communities throughout North America. The information generated in this project, concerning forest dynamics, risks from natural disturbances, and ecosystem vulnerability to climate change, is relevant to the design of climate change adaptation strategies in the forest sector and the communities that depend on the forests. Thus, while the project primarily focuses on climate change mitigation, the project results will also inform adaptation research.

Enhancing information sharing, transparency, capacity building and communication. This project has already established a record of generating and sharing information, enhancing transparency and building capacity, both through the provision of data and tools and through training and communication. The project will further help build capacity among the three countries for data analyses of climate change mitigation options in the

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forest and land-use change sector. Specifically, the project focuses on:

- generation of key input data, the development of tools and methods, and the harmonization of approaches required to assess and report GHG emissions and removals in the North American forest sector;
- collaboration with national institutions and experts, including those in the CEC projects on land-cover change and blue carbon, and academic networks, such as the Mexican Network of Intensive Carbon Monitoring Sites (RED MEX-SMIC) and the North American Carbon Program (NACP, CarboNA);
- integration of data into monitoring and reporting schemes;
- development of consistent datasets on forest carbon, land cover, and land-cover change;
- assessment of carbon in harvested wood products; and
- strengthened information sharing to improve efforts to address climate change and the transition to a low-carbon economy.

Project Summary (including a clear statement of project goal)

The forest sector is expected to play an important role in domestic GHG mitigation portfolios in all three countries. This project will help identify the most effective approaches in each country to achieve mitigation objectives in forestry sector. The specific goals are:

(1) to advance the integration and validation of science-based decision support models with improved input data to quantify the impacts of current and alternative management options for forests and harvested wood products on the carbon balance of the North American forest sector;
(2) to conduct analyses in support of policy and management decisions regarding climate change mitigation, including the reduction of emissions from deforestation and forest degradation, improved land management, and improved management of harvested wood products; and
(3) to facilitate trinational communication, information exchange, and capacity building, so that the scientific and policy communities can design, assess and potentially implement forest sector activities that will contribute to meeting national GHG emission reduction targets.

This project builds upon the successful results obtained during the previous CEC project, in which the project team developed the capacity to inform estimates of forest GHG balances using newly available and emerging scientific data, such as annual time series of 30-m resolution land-cover change and disturbance information. It will address the longer-term goals of the original project by applying the forest carbon assessment models to analyses of mitigation options in strategic forest landscapes in the three countries.

The three countries have worked together since 2011 with the support of the CEC and programs with similar goals (e.g., USAID Sustainable Landscapes, Reinforcing REDD+ and South-South Cooperation) to develop and implement empirical and process models and compare estimates obtained with them, assessing their contribution to monitoring and measuring GHGs in the forestry sector. This new project takes the next step: using the models to examine forest sector mitigation options to meet national objectives for GHG emission reductions in selected landscapes in Mexico, the US and Canada. It will enable us to quantify the impacts of various mitigation options on the GHG balance and consider how the data

and tools developed for carbon assessment might be used to support vulnerability assessments and adaptation responses, although detailed analyses of these topics are beyond the scope of this project and may be tackled in future years.

In the second year, carbon budget models will be applied for the analysis and projection of future GHG balance and climate change mitigation options in the North American forest sector in specific regions of high interest. Spatial information about the impact of natural disturbances, land cover, and land-cover change on forest carbon will provide decision-makers and land managers with the science-based analyses needed to support policy and management decisions. The assessment of mitigation options requires a systems approach that includes the assessment of changes in GHG emissions in forests, from the harvested wood products sector, and those associated with product substitution. The project will therefore develop methods to integrate carbon models to support comprehensive analyses of mitigation options in all three countries. The work will identify key elements of a monitoring system capable of assessing the magnitude of reductions in CO_2 emissions from forests, and increases in the removal of CO_2 from the atmosphere, relative to a projected baseline based on current/historical activities. The project will focus only on selected landscapes in all three countries: national-scale analyses of mitigation options will remain the responsibility of national agencies, but such analyses can be informed by the results of this coordinated research project.

Table 1 outlines examples of strategic landscapes and the potential mitigation options that could be analyzed in this project. The project initiation workshop will be used to solicit feedback from the policy and science community on the regions and mitigation options that will be examined in greater detail. Depending on data availability and complexity of the issues, the number of regions can be expanded beyond the preliminary examples provided here.

Table 1

Country	**Region**	**Examples of Potential Mitigation Options**
Canada	Central BC	Options for forest recovery after mountain pine beetle (*Dendroctonus ponderosae*) devastation; changes in forest management practices, increased emphasis on long-lived wood products.
Canada	Boreal Forest	Timber salvage operations after forest fires; changes in forest management practices, increased emphasis on long-lived wood products.
US	Northwest Region	Fire, fuel and insect management options, increased emphasis on long-lived wood products
US	Southeast Region	Reduction of deforestation rates, restoration of native forest ecosystems
Mexico	Yucatan Peninsula	Reduction of emissions from deforestation and degradation and forest management practices
Mexico	Northern Region, e.g., Durango and/or Sonora	Reduction of emissions from charcoal production, increased emphasis on long-lived wood products.

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Sustainable forest management provides a continuous supply of timber, fiber and energy to meet society's demands. The increased use of harvested wood products leads to reduced carbon storage in forest ecosystems, but greater carbon storage in harvested wood products, and can contribute to reduced emissions in other sectors. For example substitution of steel, concrete, or plastics in the building sector, or of fossil fuels in the energy sector through the use of wood products can contribute to reduced emissions in these sectors. "Displacement factors" are used to quantify the reduction of emissions through the use of forest products and are necessary to complement the analyses of changes in carbon stocks in forests and harvested wood products. This project will research, quantify and develop displacement factors for different harvested wood product categories and biofuels derived from forest biomass and their use to reduce emissions in the three countries. Regionally differentiated "displacement factors" are required because the emissions-intensity of the substituted products can vary regionally. For example, the avoided emissions of using biomass to substitute energy from a coal-burning facility will be much larger than avoided emissions from the substitution of energy from a hydro-electric facility.

Short-term Outcomes (at halfway point)

- Enhanced understanding in all three countries of carbon dynamics and GHG balances in forest ecosystems and harvested wood products (including landfills) and product substitution.
- Identification of possible climate change mitigation options and scenarios.
- The project initiation workshop will contribute to enhanced understanding among science and policy communities about the potential role of forest sector mitigation options.
- Tools and associated input data sets for selected landscapes in all three countries that will enable analyses of mitigation options in the forest sector.

Long-term Outcomes (by the end of the project)

- Application of carbon budget models for the analysis and assessment of future GHG balance and climate change mitigation options in the forest sector in specific regions of high interest in North America.
- Spatial information about the impact of natural disturbances, land cover, and land-cover change on forest carbon in specific regions of high interest in North America to provide decision-makers and land managers with some of the data needed to make policy and management decisions. Design of mitigation options requires an understanding of risks associated with natural and human-caused disturbances.
- Improved understanding and quantification of reducing emissions through use of forest products, which provides a more complete assessment of the effectiveness of forestry mitigation options.
- Facilitated trinational communication and information exchange among the scientific and policy communities. Improved capacity to design, assess and potentially implement forest sector activities that contribute to meeting national GHG emission reduction targets.
- At the conclusion of the project, a workshop with science and policy experts will contribute to the communication of project results for all three countries and could provide the information for subsequent stakeholder consultations coordinated through the CEC.

Longer-term, Environmental Outcome (post-project)

- The implementation of forest sector mitigation options identified and quantified in this project can contribute to substantial long-term reductions in national GHG emissions.

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- Analyses of the rates of deforestation and forest degradation in North America and associated emissions will improve the understanding of the impact of natural and human disturbances and quantification of mitigation options on national carbon budgets.
- Improved management of forests leading to sustainable provision of services beyond climate mitigation, such as timber production, water supply, and biodiversity.
- Improved utilization of wood products to meet the objectives of GHG emission reduction targets and transition to low carbon economies.
- Integrated approaches to mitigation and adaptation for terrestrial and aquatic (blue carbon) ecosystems.

Performance Measures (quantified SMART measures)

The project will present the results of analyses of forest sector mitigation options in reports, including peer-reviewed publications, maps, presentations, databases and documentation of the tools and methods with which these analyses were conducted. The project will compare forest sector mitigation options in the three countries. Intermediate products will be generated such as improved "activity" data (derived from time-series of land cover and land-cover change products), data processing and modeling tools, e.g., to represent carbon storage in harvested wood products and landfills, and databases that contain the relevant information that is used as input to these analyses, and can be improved and used to repeat the analyses in the future.

Outcome	Measure	Target	Indicator
Enhanced understanding among science and policy communities about carbon dynamics and GHG balances in forest ecosystems and harvested wood products (including landfills) and product substitution and possible climate change mitigation options and scenarios.	Number of strategic landscapes and possible mitigation activities selected for analysis by experts in the three countries	Appropriate information on forest carbon budget model components and mitigation activities developed for selected landscapes in each country	Increase in number of landscapes and mitigation activities analyzed by experts participating in CEC work
Application of carbon budget models for the analysis and assessment of current/historic and future GHG balance and climate change mitigation options in the forest sector in specific regions of high interest in North America.	Number and range of specific regions of high interest for which carbon budget models are applied	100% of required data collected and models applied	Increase in the number of mitigation options that are quantitatively analyzed for regions of high interest in North America
Spatial information about the impact of natural disturbances, land cover, and land-cover change on forest carbon in specific regions of high interest in North America to provide decision-makers and land managers with some of the data needed to make policy and management decisions. Design of mitigation options requires an	Number and quality of forest characteristics and activity data, including data on harvested wood products, combined with land-cover data in regions of high interest in the three countries	Target: 100% of available inventory and activity data from reliable sources are combined with geospatial data for the regions of high interest in North America	Increase in the availability of spatial information about the impact of natural disturbances, land cover and land-cover change on forest carbon in regions of high interest in the three countries

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understanding of risks associated with natural and human-caused disturbances.			
Improved understanding and quantification of reducing emissions through use of forest products, which provides a more complete assessment of the effectiveness of forestry mitigation options	New estimates of reduction in emissions resulting from the use of harvested wood products in North America, and results integrated in the analyses of mitigation scenarios	More complete assessment on mitigation options to inform decision makers and stakeholders.	Increase in the number and availability of information (specific new report and enhancements to others) to the three countries
Facilitated trinational communication, information exchange among the scientific and policy communities. Improved capacity to design, assess and potentially implement forest sector activities that can contribute to meeting national GHG emission reduction targets.	Number and quality of reports, peer-reviewed publications and datasets	The information generated through the project is available through reports, peer-reviewed publications and datasets	Increase in the number and availability of information (reports, publications, and datasets) to the three countries
At the conclusion of the project a workshop with science and policy experts will contribute to the communication of project results for all three countries and can provide the information for subsequent stakeholder consultations coordinated through the CEC.	Number or participants at workshop and participating in CEC work by region/country, area of expertise and organization/agency, collaboration of scientists in the three countries	75% of experts identified by the three countries participate in CEC forest carbon workshop	Increase in the number of experts and organizations/agencies participating in the CEC forest carbon work compared with attendance at Forest Carbon workshops held under the Operational Plan 2013-2014.

Tasks necessary to reach the environmental outcome:

Four main tasks and their subtasks are outlined below. Many tasks will be conducted in parallel. These tasks build upon previous development and application of modeling tools in the Yucatán Peninsula of Mexico, the Nez Perce-Clearwater National Forest in the United States, and Prince George, BC, in Canada. At these sites, a forest carbon budgeting model (CBM-CFS3) was parameterized with locally-available data, and results compared with an ecosystem model (DNDC) to verify that the budgeting model parameters were in agreement with expected productivity and biomass estimates, and to explore how to fill in data gaps with modeled parameters where necessary.

1) Workshops to connect with stakeholders, prepare documentation, and communicate interim and final results.
   a. Project initiation workshop to identify and select strategic landscapes with contrasting drivers of GHG emissions and a range of possible mitigation activities in the three countries (see Table 1).
   b. Periodic conference calls and other communication to inform participating institutions about project status and interim results.
   c. Final project workshop to communicate the results of the study to policy makers and the scientific community. Prepare reports, scientific peer-reviewed publications and presentations

2) Compile and validate input data including model parameters, activity data and harvested wood products data for each strategic landscape. Make recommendation for improving availability of critical data in the future.

3) Perform assessments of mitigation options and identify the most climate-effective options.
   a. Develop and run carbon accounting models for ecosystems and harvested wood products with current/historic and improved activities.
   b. Evaluate other factors to consider: product substitution, albedo (changes in surface reflectance that affect the energy balance and thus climate warming), etc.

4) Building on a small number of literature studies on displacement factors (emissions avoided through the use of harvested wood products), compile and develop new estimates of reduction in emissions resulting from the use of harvested wood products in North America (year 1) and combine these with estimates of changes in emissions from forests and harvested wood products in the analyses of mitigation scenarios (year 2).

Task #1) Workshops to connect with stakeholders, analyze results, prepare documentation, and communicate results

Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Engage science and policy experts from the three countries to identify and select strategic landscapes with contrasting drivers of GHG emissions and a range of possible mitigation activities	Agreement among agencies and experts on selected landscapes and mitigation options to evaluate in them	Provides the foundation for analyses and contributes to trinational dialogue and coordination of activities	Year 1	Year 1: $20,000 Year 2: $0
1.2 Analyze results and write assessment reports. Conduct team meetings and prepare publications and website	Assessment and reporting of mitigation options in the forestry sector of North America. Technical reports published and all data and model outputs available on website	Provides the project management and coordination necessary to implement a trinational project	Continuous throughout project	Year 1: $10,000 Year 2: $50,000
1.3 Final project workshop to communicate results and to deliver databases and	Report about stakeholder information needs relative to project outputs	This is the second opportunity to engage directly with	Year 2	Year 1: $0 Year 2: $20,000

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other relevant information		stakeholders		
Task #2) Compile and validate model parameters for each strategic landscape				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Develop parameters and inventory input data for carbon accounting and ecosystem models	Parameters and inventory data for forest models required to run mitigation scenarios	Basic requirement in assembling the data necessary for using the carbon budgeting model	Year 1	Year 1: $70,000 Year 2: $0
2.2 Develop and compile time series for activity data	Activity data sets for selected strategic landscapes	This is a basic requirement in assembling the data necessary for using the carbon budgeting model	Year 1	Year 1: $30,000 Year 2: $0
2.3 Compile data for harvested wood product model	Databases of harvested wood products for North America and recommendations on decay rates of wood in use and in landfills	This is a basic requirement in assembling the data necessary for using the harvested wood products model	Year 1	Year 1: $10,000 Year 2: $0
Task #3) Perform assessments of mitigation options and identify most climate effective options				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Run carbon accounting and ecosystem model(s)	Quantified impacts of mitigation scenarios on ecosystem carbon stocks relative to a baseline, for	The models generate the quantitative estimates needed to assess mitigation	Year 1 and 2	Year 1: $10,000 Year 2: $70,000

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	selected landscapes in North America, as agreed to by responsible institutions in each country	options		
3.2 Run harvested wood products model	Quantified impacts of mitigation scenarios on harvested wood products carbon stocks relative to a baseline, for selected landscapes of North America as agreed by responsible institutions in each country	The models generate the quantitative estimates needed to assess mitigation options	Year 2	Year 1: $0 Year 2: $10,000
Task #4) Reducing emissions through use of forest products				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
4.1 Develop new estimates (displacement factors) of reduction in emissions resulting from the use of harvested wood products	User-friendly, standard estimates of benefits from substituting wood products for other materials and fossil fuels	More complete accounting for the full impacts of mitigation options	Year 1	Year 1: $30,000 Year 2: $0
4.2 Include displacement factors in mitigation analyses	More complete assessments of mitigation scenarios for North America	More complete accounting for the full impacts of mitigation options	Year 2	Year 1: $0 Year 2: $30,000

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)
The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

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- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

This project falls within the Climate Change Mitigation and Adaptation strategic priority. Understanding the responsible drivers and the distribution of sources and sinks across diverse geographical regions and over time, as well as considering different landowner objectives, is required to sustainably manage forests and produce harvested wood products that will make a larger contribution to climate change mitigation targets. This understanding forms the basis for the desired outcome of improved design and assessment of climate change mitigation portfolios in the forest and land-cover change sector in North America.

- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

The Parties recognize that the trilateral engagement of experts working on developing consistent data and information-sharing on forest carbon can bring added value as most of North America's ecoregions span national boundaries. Such transboundary regions would benefit from consistent carbon analyses and reporting to aid respective national efforts to address climate change and effect the transition to a low-carbon economy. The project will supply data, information and tools that can be used to monitor and report on the development and implementation of appropriate initiatives to reduce GHG emissions from land use and forest management. The project will also facilitate a broad and readily accessible mechanism for the sharing and disseminating information among North American experts with a focus on scientific and technological best practices.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

This project will generate improved understanding of the role of the North American forest sector in climate change mitigation, the possible pathways to reducing emissions and increasing carbon sinks, and the magnitude and timing of these mitigation benefits. These results will be summarized in reports, including peer-reviewed publications, maps, presentations, and documentation of the tools with which these analyses were conducted. The project will also develop improved estimates of greenhouse gas emissions for selected regions of high interest (thus contributing to reporting obligations and the reduction of uncertainties in reported values), and estimates of carbon stocks in forests and, to the extent practicable, in harvested wood products. To enable these outcomes, intermediate products will be generated, such as improved activity data (derived from time-series of land cover and land-cover change products), data processing and modeling tools, and databases that contain the relevant inputs to these analyses. Many of these intermediate products, such as land-cover information and the compilation of annual activity data (e.g., rates of disturbances and land-use change) will also be valuable to other user communities.

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- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking this project, considering these points:**
    - **The value-added of doing it under the CEC cooperative program**
    - **Any other public, private or social organizations that work on such activities**
    - **Opportunities to cooperate and/or leverage resources with such organizations**

The CEC is the ideal body to facilitate cooperation among governmental institutions for projects with a scope on the North American continent. The CEC has been supporting the North American Carbon Modeling Group since 2011 and the North American Land Change Monitoring System since 2007. The latter group is a leader in assisting with the establishment of continental land cover and land-cover change data at the appropriate scale (250m) to support North American ecosystem carbon quantification and monitoring. Due to the trinational nature of the work, the project is well positioned to support the collaboration of the Parties' experts in exchanging knowledge on best practices in modeling and assessing North American forest carbon dynamics and climate change mitigation options.

Other organizations working on similar activities include:

- The North American Forestry Commission, Atmospheric Change and Forest Inventory Working Groups;
- The North American Carbon Program (CarboNA), a trilateral research consortium coordinated by representatives of the three countries, including participants in this project (since CarboNA lacks independent funding, it merely provides a forum for information exchange through conference calls and bi-annual meetings);
- USAID/Mexico bilateral program on "Sustainable Landscapes," which is focused on several closely related tasks, including improving availability of field data, improving data management, disturbance mapping, and modeling of ecosystem response to disturbances and management;
- Canada/Mexico bilateral collaboration focused on developing national- and regional-scale modeling approaches to support needs for Monitoring, Reporting and Verification (MRV), but without independent funding; and
- Mexico/Norway initiative which is focused on developing the national MRV system for Mexico.

Opportunities to cooperate and/or leverage resources with such organizations include:

- The established collaboration among the various programs operating in the three countries, and their sponsoring institutions: particularly the three forest services (CFS, USFS, Conafor) and three geographical institutions (NRCan, USGS, INEGI), among others. This collaboration is highly effective at coordinating efforts, avoiding duplication of effort, and taking advantage of synergistic opportunities.
- Some specific tasks in this project that will benefit greatly from leveraging the resources of other programs include: developing composite data about activities; mapping of stand age and disturbance; developing and testing empirical and process models; and analyzing mitigation options. Because of the limited budget, the CEC project members will aggressively seek to leverage resources in order to achieve the desired outcomes.

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- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

The tasks in this project will put in place strong continental networks and will provide data, maps and information. By project end, these activities should be integrated into the regular work programs of the trilateral land cover and carbon monitoring programs already well-established at USGS, USFS, Natural Resources Canada, Environment Canada, Conafor, Conabio, INECC and INEGI. Outputs will allow carbon accounting initiatives in North America to be monitored. In addition, the project will support the scientific collaboration of experts from each country in producing and sharing this information. The CEC funding will put in place a strong collaborative framework that will continue after the CEC involvement through the bilateral and trilateral work of the forestry services and the North American Land Change Monitoring System.

The project proposes a clear and well-coordinated timeline: in year 1, the focus of the activities is on model development for forest ecosystem and harvested wood products modelling, testing and the acquisition of relevant input data both at the continental and regional scales (e.g., activity and land cover information). In year 2, the focus is the ongoing data processing and application of models and decision support tools to quantify the climate change mitigation potential of the North American forest and land-use change sector. The project will put into place improved monitoring capacity, and decision support tools with the required documentation to ensure that experts in all three countries will be able to continue the use of these tools for reporting and analyses after completion of the CEC-funded phase of the project.

- **Where applicable, identify with reasonable specificity:**
    - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**
    - **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**
    - **The beneficiaries of capacity building activities that the project may include**
    - **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

This work was previously part of the Climate Change–Air Quality cluster of projects that supported measuring emissions and quantifying carbon sinks, mapping ecosystem carbon, and developing approaches to mitigate black carbon. This new project builds upon work begun during the previous operational plan. It will complete the integrated modeling and assessment project by applying the carbon assessment models to strategic landscapes in the three countries.

Canada, Mexico, and the United States have worked together since 2011 under the sponsorship of the CEC and in programs with similar goals (e.g., USAID Sustainable Landscapes, Reinforcing REDD+ and South-South Cooperation) to identify the potential role of models and their contribution to monitoring and measurement of GHG in the forestry sector. This new project takes the next step in using the modeling tools to examine forest sector mitigation options to meet national objectives of greenhouse gas emission reductions for selected landscapes in North America.

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Past work supported by the CEC that will contribute to this project includes:

(1) Results from the North American Land Change Monitoring System (NALCMS), which generates data on land cover and land-cover changes across North America. In cooperation with experts from NACLMS, we are adding value to these CEC products by using the output from the project (time-series of land cover changes) as input to our modeling tools that can translate land-cover change information into policy-relevant information about past GHG emissions resulting from deforestation, degradation, forest management and other disturbances. In addition to information from CEC projects, data from other sources (e.g., in Mexico the MAD-MEX system) will inform the analyses in the proposed project.

(2) Implementation and testing of carbon accounting models that can process data from NALCMS and other sources, such as national forest inventories, into estimates of emissions and removals, and that can then be used to estimate future carbon emissions and removals for analyses of policy scenarios.

(3) Analyses of ecosystem carbon dynamics using a process model to determine the ability of process-models (i.e., models that use climate data and other information) to fill data gaps in areas where forest inventory information is incomplete or inaccurate. This model has been applied in test landscapes in all three countries and results are being compared to other sources of information, including the empirical modeling approach.

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Project 2: Helping North American Communities Adapt to Climate Change: A Pilot Syndromic Surveillance System for Extreme Heat	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$400,000 **Year 1** (1 July 2015–30 June 2016): **C$205,000** **Year 2** (1 July 2016–30 June 2017): **C$195,000**	

Strategic Priority/Subtheme

- Climate Change Mitigation and Adaptation

How will this project address the cross-cutting themes?

This project aligns with the following CEC cross-cutting themes: (1) learning from and assisting vulnerable groups and communities and (2) enhancing information sharing, capacity building and communication. The project is intended to help selected North American communities increase their adaptation capacity to the adverse environmental health effects of extreme heat. This will be achieved through the development of a pilot syndromic surveillance system for heat and through the identification of the associated health impacts on vulnerable populations within each community. The pilot syndromic surveillance system could be used as a situational awareness tool to support decision-making, allow early detection of heat-related health risks in geographically distinct locations, and enhance targeted communication measures designed to raise awareness among the general public and the most vulnerable groups about the dangers of extreme heat. Another important output from this project is a summary report, containing methodological information as well as guidelines and lessons learned on the design and implementation of real-time syndromic surveillance systems that can be shared with other North American communities.

Project Summary (including a clear statement of project goal)

In the context of climate change, extreme heat events (EHEs) are expected to significantly increase in frequency, duration and intensity in several regions of North America enduring the course of this century. This would result in an increase of heat-related morbidity and mortality especially among vulnerable populations and in communities that have limited capacity to respond and adapt to this environmental health risk. In parallel, several communities are taking important actions to build resiliency and adapt to the effects of extreme heat by implementing heat alert and response systems and monitoring health indicators that will aid understanding the health impacts of extreme heat. Syndromic surveillance systems are increasingly being expanded to monitor the impact of climate and environmental exposures on populations in a timely manner. These systems are an efficient way to build resiliency to climate change as they are designed to give early detection of public health threats and to support decision-making during an emergency.

The main goal of this project is to develop a pilot operational, real-time syndromic surveillance system for EHEs in three at-risk communities in Canada, Mexico and the United States, and to highlight in a guidance document best practices and lessons learned on developing a syndromic surveillance system for EHEs. Throughout this project, a number of activities are suggested that will produce a database of comparable health, climate and population information, GIS maps of populations vulnerable to EHEs, and facilitated discussions and knowledge transfer between North American public health professionals and experts.

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The proposed syndromic surveillance system could be used as a tool for situational awareness and could support local public health professionals and emergency management officials as they respond to EHEs. The project will be completed in collaboration with selected health authorities who currently have existing capacity with similar systems to take advantage of their expertise and knowledge. This approach should facilitate completion of the project and help avoid delays in the development and implementation of the system.

Short-term Outcomes (at halfway point)

- Pilot communities from Canada, US and Mexico identified and engaged in project.
- Needs identified through a literature review and through a survey on the use of syndromic surveillance systems.
- A better understanding of the relationship between extreme heat and health outcomes through data collection and statistical analysis in the selected communities.
- Groups and populations vulnerable to extreme heat in the selected communities identified and mapped.
- Enhanced capacity of each participating community through the design and development of a pilot syndromic surveillance system for heat.

Long-term Outcomes (by the end of the project)

- Reduction of environmental health risks due to extreme heat and better situational awareness in each participating community through the use of an operational pilot syndromic surveillance system for heat.
- Knowledge sharing provided via a public web-based tool on the potential populations and areas vulnerable to extreme heat in participating communities.
- Knowledge transfer through a guidance report on developing syndromic surveillance for heat including lessons learned from the three case studies and detailed information about each database used in the project.
- Enhanced awareness through a North American workshop on syndromic surveillance and climate change.

Longer-term, Environmental Outcomes (post-project)

- Promotion of healthy communities and building capacity of the health care sector to better respond during extreme heat events in a changing climate (through a situational awareness tool: a real-time syndromic surveillance system for heat).
- Improvement of the environment of North America through the use of syndromic surveillance that provides evidence-based information on vulnerable populations and targeted urban areas where specific environmental measures are needed. These measures include the protection of existing green spaces, the promotion of green buildings, the reduction of urban heat island effects, and the reduction of outdoor air pollution.
- Facilitate knowledge transfer and promote capacity building through a possible expansion of the pilot syndromic surveillance system to other communities and through the establishment of a North American Working Group on syndromic surveillance of health and climate-related impacts.

Performance Measures (quantified SMART measures)

- Identification of communities that have syndromic surveillance systems in place.
- Implementation of a pilot real-time syndromic surveillance system for extreme heat in three at-risk communities in North America.
- Generation of maps of vulnerable populations that can be used for analysis and knowledge transfer.
- Number of heat-related illness detected by the pilot syndromic surveillance system.
- Identification of populations potentially vulnerable to extreme heat in participating communities (such children or seniors with existing medical conditions).

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Tasks necessary to reach the environmental outcome:

1) Research and vulnerability assessment ($105,000)
2) Design and development of the pilot SS system ($90,000)
3) Implementing, testing and validating the pilot SS system ($75,000)
4) Knowledge sharing and transfer ($130,000)

Task #1) Research and vulnerability assessment

Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Needs assessment and consultation with partners to select participating communities	Collect feedback from local and regional health authorities on the needs in terms of syndromic surveillance in North America and selection of three at-risk communities in Canada, US and Mexico based on defined criteria	This subtask is key to the achievement of the project. Its output allows the identification of the participating communities and initiates discussions with multiple partners to have a better understanding of the population needs and vulnerabilities in the selected communities	Year 1 (July–Sep 2015)	Year 1: $21,000 (contracts) Year 2: $0
1.2 Literature review and collection of historical health, climate (weather and air) and census data	A summary on the types of syndromic surveillance systems in North America and on methods to implementing real-time health surveillance. A community-based database that includes health, population, climate data and other sources of information such land cover, vegetation, urban heat islands, etc.	Having an overview of existing methods of human health surveillance in North America and building a multi-source database will help the design and development of the pilot syndromic surveillance. It is also the foundation towards a better understanding of heat health risks in participating	Year 1 (Aug–Dec 2015)	Year 1: $42,000 (contracts) Year 2: $0

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		communities.		
1.3 Statistical analysis of historical data and mapping vulnerabilities	- A consistent method to quantify the relationship between extreme heat and health outcomes - A series of GIS maps, publicly available, on the types vulnerable populations and targeted areas at risk to extreme heat - A definition of a syndrome for heat that could be used in the pilot syndromic surveillance system	Provides evidence-based information on heat health risks and on potentially vulnerable populations in the participating communities	Year 1 (Sep 2015–March 2016)	Year 1: $32,000 (contracts, report) Year 2: $0
1.4 Summary of the findings and description of vulnerabilities in the selected three pilot communities	An internal report that includes key results from Task #1 and recommendations on relevant health and climate variables to monitor during an extreme heat event	This report could be used by the participating communities as a working document to support the design and development of the pilot syndromic surveillance system.	Year 1 (March–Apr 2016)	Year 1: $10,000 (contracts, report) Year 2: $0
Task #2) Design and development of the pilot SS system				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Identification of data sources and preparation of data sharing agreements	- Formal discussions between local/regional health authorities and health data providers or owners - A consistent reporting approach to collect real-time health and climate data	Having formal agreements for data sharing and transfer between data providers and the host organization will facilitate the development and implementation of the pilot syndromic surveillance system.	Year 1 (Feb–June 2016)	Year 1: $36,000 (contracts) Year 2: $0

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2.2 Development of a protocol to collect and communicate real-time health and climate data	- Identify/implement a computer-based platform to receive and store real-time data - Develop health indicators that capture heat-related illness or death and Identify links with other climate and population databases	This task will enhance the capacity of local community respond during an extreme event by using a solid platform to collect real-time data and by linking health outcomes with climate and population data.	Year 1 (Feb–June 2016)	Year 1: $45,000 (contracts) Year 2: $0
2.3 Training sessions to health care providers	Provide guidelines to health care providers to better recognize, diagnose and code heat-related illness	Providing training and guidance materials to targeted health care providers is crucial to the success of the pilot syndromic system.	Year 1 (June 2016)	Year 1: $9,000 (contracts) Year 2: $0
Task #3) Implementing, testing and validating the pilot syndromic surveillance system				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Implementing of and testing the pilot syndromic surveillance system	Piloting the syndromic surveillance system for heat during the summer of 2016	This sub-task will provide the participating communities with increased capacity to respond to extreme heat events.	Year 2 (Jul–Aug 2016)	Year 1: $0 Year 2: $15,000 (contracts)
3.2 Analysis of data collected during Summer 2016	-Identification of the number of heat-related illness captured by the pilot system and comparison with historical data - Identification of weather-related conditions or thresholds that are correlated with the number of heat-related illness	Analysis of data collected from the pilot syndromic surveillance system will help participating communities assess and understand the impact of extreme heat on health, especially among the most vulnerable.	Year 2 (Sep–Dec 2016)	Year 1: $0 Year 2: $37,500 (contracts)

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3.3 Evaluation and validation of the pilot syndromic surveillance system	- Identification of the strengths and weaknesses of the pilot system and preparation for full implementation in summer 2017 - Guidelines for public health professionals to support the community with evidence-based information during extreme heat events	Evaluating the pilot system will confirm the utility of the variables monitored during an extreme heat event and improve internal communications among the system's stakeholders.	Year 2 (Dec 2016–May 2017)	Year 1: $0 Year 2: $22,500 (contracts)
Task #4) Knowledge sharing and transfer				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
4.1 Develop a summary report on methodology, results, and lessons learned from the three participating communities	A guidance document on the use of syndromic surveillance systems for heat with lessons learned and recommendations from the three pilot communities	The report could be a reference for other North American communities interested in developing a similar syndromic surveillance system to protect their vulnerable populations and build resilience to extreme heat events.	Year 2 (March 2016–June 2017)	Year 1: $10,000 (contracts) Year 2: $40,000 (contracts, report)
4.2 Face-to-face meeting of representatives from participating communities	- Sharing information on successes and technical issues - Discussion of lessons learned and challenges during the implementation of the system - Identification of next steps to improve the pilot system	The meeting is an opportunity for the three pilot communities to exchange information, share best practices, and explore options to resolve ongoing issues related to the development or implementation of the pilot syndromic surveillance system.	Year 2 (Sep–Oct 2016)	Year 1: $0 Year 2: $25,000 (meeting, report)

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4.3 Conduct a workshop to present the three systems to partners and other communities	- Presentations of the development and implementation of the three pilot syndromic surveillance systems - Dissemination and presentation of the guidance report on syndromic surveillance systems - Knowledge sharing and transfer to other communities through visual demo of the pilot systems	Conducting this workshop will promote the use of syndromic surveillance for extreme heat in North America and will provide participants with practical information on the identification of vulnerable population to extreme heat. It is an opportunity to build networking among participants to the workshop.	Year 2 (May–June 2017)	Year 1: $0 Year 2: $55,000 (facilitator, meeting, workshop report)

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- ***How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?***

  This project contributes to achieving the Council's strategic objectives in addressing adaptation to climate change in selected North American communities and in enhancing environmental and health data sharing among several partners and stakeholders. The collaborative efforts expected in this project will help build capacity within the stakeholders and professionals of the target communities. This will be accomplished through the implementation of heat-related illness syndromic surveillance capabilities in each target community and the creation of a platform for sharing knowledge and exchanging best practices in order to increase the capacity of the three pilot communities to respond to extreme heat event and to protect their vulnerable populations. It is anticipated that the increased resources created through this project and the information sharing through documentation exchange will lead to follow-on development of similar capacity in other communities across Canada, Mexico, and the United States, through existing networks and public health associations.

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- ***Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)***

  The proposed project aims to increase the adaptive capacity to climate change of three selected vulnerable communities in Canada, US and Mexico and to provide these communities with an evidence-based tool to support decision-making during periods of extreme heat. As knowledge transfer is a key task in this project, it is expected that other North American communities will benefit from these cases studies and develop a similar system for climate-related and health syndromic surveillance. This project will make use of existing networks and stakeholder organizations to ensure the efficient and accessible translation of this knowledge both in the development stage, as well as the post-project stage.
  A syndromic surveillance system for heat is primarily developed to detect the prevalence of heat-related illness and deaths in a selected community. However, it is also a tool that provides information on the location of vulnerable populations that are often socio-economically deprived and are located in urban areas with limited green spaces and high air pollution rates. Outcomes from syndromic surveillance systems for heat can support the identification of targeted areas in an urban agglomeration where there is a need to have more green spaces and green buildings, to reduce the effects of urban heat islands and therefore improve the quality of outdoor air. For these reasons, we consider that the proposed results of this project are relevant to protecting the environment and to promoting sustainable and healthy communities.

- ***What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.***

  The main results from this project are:
  - Identification of communities that have syndromic surveillance systems in place
  - Implementation of a pilot real-time syndromic surveillance system for extreme heat in three at-risk communities in North America
  - Generation of vulnerable population maps that can be used for analysis and knowledge transfer
  - Number of heat-related illness detected by the pilot syndromic surveillance system
  - Identification of potential vulnerable population to extreme heat in participating communities (such children or seniors with existing medical conditions)

  Performance will be measured through achieving a number of milestones. These milestones have been identified in each task and sub-task of the project with specific deliverables and timelines. This will facilitate the monitoring of work progress over the two-year period of the project. In addition, monthly teleconference meetings will be scheduled to provide the participating communities and other partners with an ongoing opportunity to discuss the status of work progress and to address common issues and challenges.

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- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking this project, considering these points:**
    - **The value-added of doing it under the CEC cooperative program**
      The CEC is a unique organization that brings together several stakeholders and key partners from the environment sector in North America and has existing mechanisms to promote collaborative efforts in terms of adaptation to climate change.
    - **Any other public, private or social organizations that work on such activities**
      Public health organizations have usually the mandate to develop and implement syndromic surveillance systems that detect and report communicable diseases such as infectious syndromes. However, there are very few organizations that have adapted their system to capture real-time health outcomes from extreme weather events.
    - **Opportunities to cooperate and/or leverage resources with such organizations**
      There are definitively opportunities to leverage knowledge and expertise with health authorities that have already developed similar systems in North America or internationally. As one the leads of the project, Health Canada can rely on its expert network to engage partners such as local and regional Canadian health authorities, the US CDC and the Federal Commission for Protection against Sanitary Risk in Mexico.
- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

  This project defines clear timelines for each step of the development and implementation of the pilot syndromic surveillance system and for other outcomes identified in the project proposal. The selected communities are expected to continue to rely on their syndromic surveillance systems for heat as a tool for situational awareness and decision-making during extreme heat events. It is also expected that these types of systems will be expanded to other communities using the guidance document and current knowledge of the pilot communities.
- **Where applicable, identify with reasonable specificity:**
    - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**
      The project builds upon the CEC's experience in providing information about environmental stressors in their communities through projects such as Tracking Pollutant Releases and Transfers in North America, and AirNow. The project could capitalize on the Secretariat's experience with geographic information systems and the mapping component could be integrated into the CEC's North American Environmental Atlas. Climate and population density data gathered under this project could be used to update the existing Atlas map layers. In the future, vulnerability maps may be combined with information about pollutant releases from the CEC's Taking Stock Online and North American Portal on Climate Pollutants to assess cumulative exposures of communities to multiple environmental stressors.

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- **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**
  Output from the pilot syndromic surveillance system for heat along with GIS maps on vulnerable populations can be used by public health professionals, emergency management officials, municipalities, academia and environmental specialists. The guidance report can be used as a reference document by other North American communities that envisage developing and implementing a real-time syndromic surveillance system.
- **The beneficiaries of capacity building activities that the project may include**
  Vulnerable populations and the general public by raising awareness to the health effects of extreme heat.
- **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**
  Local and regional health authorities, municipalities and environmental agencies are key stakeholders of the project.

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Project 3: North American Initiative on Food Waste Reduction and Recovery	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$460,000 **Year 1: C$230,000** **Year 2: C$230,000**	

Strategic Priority/Subtheme

- Climate Change / Short-lived Climate Pollution
- Green Growth / Sustainable Production and Consumption

This project is positioned under the *Climate Change: Short-lived Climate Pollution* cluster, but also has linkages to the *Green Growth: Sustainable Production and Consumption* cluster.

How will this project address the cross-cutting themes?

The project will address the above cross-cutting themes by:

1. Reducing methane emissions from landfills (by reducing food waste);
2. Reducing food waste from commercial sources including food processing, wholesale, distribution and transport, grocers and restaurants, and other institutional sources (e.g., hospitals, schools and universities, nursing homes and prisons); and
3. Raising awareness regarding best practices, policies and other approaches for reducing food waste.

Project Summary (including a clear statement of project goal)

Food waste refers to food that is or was of good quality and originally fit for human consumption but that does not get consumed because it is discarded either before or after it spoils. Canada's National Zero Waste Council indicates that discarded food generally falls into three categories: (1) surplus food that is still suitable for feeding people or animals; (2) food that is not suitable for feeding people or animals due to spoilage; and (3) food waste such as trimmings, peels, cores, bones and similar residual scraps. Food waste is a subset of organic waste, which also includes yard trimmings, wood waste, paper and paperboard products.

According to the World Bank, up to one-third of the world's food produced for human consumption either is lost during processing or is wasted by consumers due to evolving consumption patterns.[1] North America and Oceania stand out from other developed regions with the most food wasted per capita.[2] It is estimated that approximately 13% of greenhouse gases in the United States are associated with growing, manufacturing, transporting, and disposing of food.[3] According to the latest figures from the US EPA (for 2012) on municipal solid

[1] World Bank. February 2014. Infographic: Food Loss and Waste. <www.worldbank.org/en/news/feature/2014/02/27/infographic-food-loss-waste>.

[2] Lipinski, B., C. Hanson, J. Lomax, L. Kitinoja, R. Waite, T. Searchinger. 2013. *Reducing Food Loss and Waste*. UNEP: World Resources Institute Working Paper. <www.wri.org/publication/reducing-food-loss-and-waste>.

[3] US EPA. Sept 2009. *Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices*. http://www.epa.gov/oswer/docs/ghg_land_and_materials_management.pdf

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waste generation, recycling, and disposal, food waste food waste is the single largest waste stream sent to landfills in the US, comprising 21 percent of the municipal solid waste disposed in landfills.[4] In Canada, the estimated quantifiable value of food waste generated in 2014 was $31 billion, 53 percent of which was attributed to on-farm production waste, or losses during processing, transport and distribution, at restaurants and hotels, and at retailer sources (with residential consumers accounted for the remainder of the waste).[5]

In Canada, Mexico, and the United States, a predominant amount of food waste is disposed of in landfills, where it is decomposed by bacteria under anaerobic conditions, contributing to the formation and release of methane gas. Methane is a short-lived climate pollutant and greenhouse gas that is over 20 times more potent than carbon dioxide and has an atmospheric lifetime of about 12 years.[6] Methane emissions from the waste sector in Canada, Mexico, and the US account for 20,[7] 6,[8] and 18 percent[9] of total national methane emissions, respectively.

Food waste represents a significant component of the waste stream entering landfills that can be reduced (e.g., through industry and business practices, raising awareness, etc.), thereby contributing to significant reductions in short-lived climate pollutants. Reduction of food waste complements ongoing country efforts under the United Nations Framework Convention on Climate Change, to which Canada, Mexico, and the United States are Parties. It also helps to preserve landfill space, and reduce the formation of leachate and odors at landfill sites. It is also recognized that the reduction of food waste contributes to sustainable development goals, including sustainable materials management and resource efficiency, with linkages to CEC priorities (i.e., green growth), other international commitments (e.g., UN 10-year framework of programmes on sustainable consumption and production patterns), and various national initiatives (e.g., US Food Waste and Recovery Challenges, initiatives of the Canadian Council of Ministers of the Environment on waste management, and Mexican general policies on sustainable consumption and production, clean production, and organic waste).

The goal of this project is to enhance North American capacity for reducing the disposal of food waste in landfills by exploring opportunities to achieve food waste reduction and recovery within relevant North American industry, commercial, and institutional sectors (e.g., food processing, wholesale distribution and transport, grocers and restaurants, hospitals, schools and universities, nursing homes and prisons). Specifically, this project will focus on "front-end" activities of the food recovery hierarchy that target food *before it becomes a waste.* Examples of front-end activities that support food waste reduction and recovery include:

(1) source reduction – minimizing the amounts of surplus and residual food generated within the food supply chain;
(2) feeding people – using safe, quality surplus food to feed hungry people (e.g., at food banks, shelters, senior centres, etc.); and

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[4] US EPA. February 2014. *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2012.* EPA-530-F-14-001. <www.epa.gov/wastes/nonhaz/municipal/pubs/2012_msw_fs.pdf>.

[5] Gooch, M., A. Fefel. 2014. *$27 Billion Revisited - The Cost of Canada's Annual Food Waste.* Value Chain International Inc.

[6] UNEP. What are Short-Live Climate Pollutants? <www.unep.org/ccac/Short-LivedClimatePollutants/Definitions/tabid/130285/Default.aspx>.

[7] Government of Canada, 2014. *Canada's Sixth National Report on Climate Change* <www.ec.gc.ca/cc/0BA54AAB-6E8E-4D48-B42C-DCBB09B27D10/6458_EC_ID1180-MainBook_high_min FINAL-s.pdf>.

[8] Semarnat. 2013. Programa Especial de Cambio Climático: 20142018. Mexico. <www.dof.gob.mx/nota_detalle.php?codigo=5342492&fecha=28/04/2014>.

[9] US EPA. n.d. Overview of Greenhouse Gases. <http://epa.gov/climatechange/ghgemissions/gases/ch4.html>.

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(3) feeding animals – using safe, quality food scraps as animal feed (e.g., pig farms).

Tasks and subtasks under this project are outlined as follows:

1. **Gather foundational knowledge and information to better understand the current situation of food waste reduction and recovery in North America** by:
   - 1.1 Consolidating knowledge and information regarding the amounts, types, sources, and causes of food waste in the food supply chain, and describing relevant North American and international government policies and incentives to support food waste reduction;
   - 1.2 Establishing a tele-network with experts in food waste reduction and recovery in the three countries for the duration of this project; and
   - 1.3 Tele-networking with the CEC project group responsible for the North American Initiative on Organic Waste Diversion and Processing for the duration of this project.

2. **Encourage food waste reduction and recovery in relevant North American industry, commercial and institutional sectors (e.g., food processing, wholesale distribution and transport, grocers and restaurants, hospitals, schools and universities, nursing homes and prisons)** by:
   - 2.1 Identifying approaches to measure, track and report on food waste reduction and recovery in relevant industry, commercial and institutional sectors, based on existing approaches and methodologies; and
   - 2.2 Identifying current practices and processes to achieve food waste reduction and recovery in relevant industry, commercial and institutional sectors.

3. **Identify opportunities to further advance food waste reduction and recovery in North America** by:
   - 3.1 Identifying gaps, challenges, recommendations and strategies to advance food waste reduction and recovery in North America; and
   - 3.2 Hosting a North American Workshop on Food Waste Reduction and Recovery to share and discuss relevant approaches and opportunities for reducing food waste, and provide a forum to critique the three draft reports and draft white paper produced in Tasks 1, 2, and 3 (see below).

4. **Share knowledge on food waste reduction** by:
   - 4.1 Developing a clearinghouse mechanism or online information-sharing platform to communicate knowledge, approaches, tools and opportunities for food waste reduction and recovery; and
   - 4.2 Translating project outputs intended for public dissemination.

Short-term Outcomes (at halfway point)

- Draft report (subtask 1.1) to consolidate knowledge and information on the current status of food waste reduction and recovery efforts in the three countries (including information on the impact of food waste reduction and recovery on reducing short-lived climate pollutants)
- Network of experts involved in food waste reduction and recovery in the three countries

- Draft report (subtask 2.1) on the current status of efforts and varied methodologies to measure, track and report on food waste and recovery.
- Draft report (subtask 2.2) on best practices to support food waste reduction
- Draft white paper (subtask 3.1) to identify gaps, challenges, recommendations and strategies to advance food waste reduction and recovery in North America.

Long-term Outcomes (by the end of the project)

- North American Workshop on Food Waste Reduction and Recovery, workshop report, and summary of participant comments regarding draft reports and the draft white paper.
- Finalization of the draft reports and white paper, based in part on recommendations from the North American Workshop and other stakeholder organizations
- Clearinghouse mechanism or online information-sharing platform to communicate knowledge, practices and opportunities for food waste reduction and recovery

Longer-term, Environmental Outcome (post-project)

This project represents a first step by the CEC to undertake work focused on food waste reduction and recovery. This project will reduce the generation of food waste in relevant North American industry, commercial and institutional sectors. Given that food waste can account for 20% or more of waste disposed in landfills, its reduction will prolong the service life of existing landfills, offsetting the need (and associated costs) to site and construct new ones. Expanding food recovery efforts to further support local food banks and pantries will also help to address food insecurity in the three countries.

As a whole, the project will help Canada, Mexico, and the United States achieve international and national commitments regarding both climate change and sustainable development. With the collaboration of experts in three countries, the project will reduce duplication of effort, identify approaches to improve food waste reduction and recovery, and contribute to the development and uptake of policies and best practices in all three countries. It will also contribute important baseline information that will enable a better understanding of the types, quantities, and current management of food waste in North America, as well as options for improving food waste reduction and recovery. While the project will foster collaboration with the industrial, commercial and institutional sector and other stakeholders that have roles to play in food waste reduction and recovery, additional CEC work may be required to address a wider spectrum of opportunities in the future.

Performance Measures (quantified SMART measures)

Performance measures/indicators are identified in the table below.

Tasks necessary to reach the environmental outcome:

1) Gather foundational knowledge and information to better understand the current situation of food waste reduction and recovery in North America;
2) Encourage food waste reduction and recovery efforts in relevant North American industry, commercial and institutional sectors (e.g., food processing, wholesale, distribution and transport, grocers and restaurants, hospitals, schools and universities, nursing homes and prisons);
3) Identify opportunities to further advance food waste reduction and recovery efforts in North America; and

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4) Share knowledge on food waste reduction and recovery.

TASK #1) Gather foundational knowledge and information to better understand the current situation of food waste reduction and recovery in North America

Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing and Performance Measures/Indicators**	**Budget (C$)** (activities)
1.1 Consolidate knowledge and information regarding the amounts, types, sources, and causes of food waste in the food supply chain and describe government policies and incentives to support food waste reduction and recovery that would be relevant to North America and internationally. [consultant assistance required]	A report to: (1) identify the amounts, types, sources, and causes of food waste in the food supply chain; (2) identify relevant policies and incentives to support food waste reduction and recovery; (3) identify key stakeholder organizations for possible participation on food waste reduction and recovery efforts; and (4) identify and quantify linkages related to the reduction of short-lived climate pollutants. Content will be based on existing, available information. (Work will target commercial sources, including food processing, wholesale distribution and transport, grocers and restaurants, and other institutional sources (e.g., hospitals, schools and universities, nursing homes and prisons.) ***The draft report will be shared at the North***	The report will contribute to developing a better understanding of the current situation of food waste reduction efforts in the three countries. It will provide information on the impact of food waste reduction on reducing short-lived climate pollutants.	**Year 1**: Draft report (for use during workshop) **Year 2**: Finalize report (after the workshop) **Performance Measures/Indicators:** - Production of food waste report - Number and diversity of stakeholders that participated in preliminary food waste reduction and recovery information-gathering - Critical reception of report by stakeholders - Number of times report is requested	Year 1: $60,000 Year 2: $20,000

	American Workshop on Food Waste Reduction referenced in subtask 3.2.			
1.2 Establish a tele-network involving experts in food waste reduction and recovery in the three countries, for the duration of this project. [regular conference calls]	A network of experts involved in food waste reduction in the three countries.	The network will provide a means through which industry and other experts can contribute knowledge and discuss food reduction and recovery and related challenges and opportunities. This network will also be used to facilitate early and ongoing engagement with interested stakeholders, including those in the industry and commercial food sectors for project outputs.	**Year 1**: Formation of a network **Year 2**: Continued networking **Performance Measures/Indicators:** - Conference calls are held - Number and timing of conference calls - Number and diversity of stakeholders participating during calls	Year 1: $500 Year 2: $500
1.3 Tele-network with the CEC intergovernmental project group responsible for the North American Initiative on Organic Waste Diversion and Processing, for the duration of this project. [periodic conference calls]	A network with the CEC intergovernmental project group responsible for the North American Initiative on Organic Waste Diversion and Processing. NB: It is anticipated that there will be some overlap in the government representation for the two CEC projects.	The network will provide a means through which government representatives of the two project groups can discuss cross-cutting issues and avoid potential duplication of effort and resourcing through contracts or other work and activities.	**Year 1**: Formation of a network **Year 2**: Continued networking **Performance Measures/Indicators:** - Conference calls are held - Number and critical timing of conference calls	Year 1: $500 Year 2: $500

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TASK #2) Encourage food waste reduction and recovery in relevant North American industry, commercial and institutional sectors *(e.g., food processing, wholesale, distribution and transport, grocers and restaurants, hospitals, schools and universities, nursing homes and prisons)*				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Identify approaches to measure, track and report on food waste reduction and recovery in relevant industry, commercial and institutional sectors, based on existing approaches and methodologies [consultant assistance required] ***This work will involve engagement with interested stakeholders, including those in industry, commercial and institutional sectors.***	A report containing case studies to identify, discuss and compare approaches to measure, track and report on food waste reduction and recovery in relevant industry, commercial and institutional sectors, including a description of deficiencies and inconsistencies where they may exist. The report will also examine how food waste is defined to better understand possible variations and the influence they may have on data reporting. Work will focus on relevant existing approaches in North America and elsewhere (e.g., Europe). Information from case studies will be presented in a compatible manner to facilitate comparisons. ***The draft case study report will be shared at the North American Workshop on***	Showcasing real world examples will help raise awareness and can stimulate uptake of approaches to measure, track and report on food waste where they are not yet in place. Doing so will support trilateral efforts to more accurately quantify savings from greenhouse gas reductions that can be achieved through food waste reduction and recovery. This work will also help to assess if guidance on measuring, tracking and reporting food waste reduction and recovery is needed, which could form the basis of possible future CEC work.	**Year 1**: Draft report (for use during workshop) **Year 2**: Finalize report (after the workshop) **Performance Measures/Indicators:** - Case study report is produced - Number and diversity of stakeholder sectors that participated in reduction and recovery information-gathering - Critical reception and uptake of case study report by stakeholders - Number of times report is requested	Year 1: $60,000 Year 2: $20,000

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	Food Waste Reduction and Recovery referenced in subtask 3.2.			
2.2 Identifying current practices and processes to achieve food waste reduction and recovery in relevant industry, commercial and institutional sectors. [consultant assistance required] ***This work will involve engagement with interested stakeholders, including those in industry, commercial and institutional sectors, and hunger relief organizations.***	A report containing case studies to identify, discuss and compare practices and processes to achieve food waste reduction and recovery in relevant industry, commercial and institutional sectors, including a description of deficiencies and inconsistencies, where they may exist, and an overview of business rationale and considerations for selecting practices and processes. Work will focus on relevant existing practices and processes in North America and elsewhere (e.g., Europe). Case study information will be presented in a compatible manner to facilitate comparison. ***The draft case study report will be shared at the North American Workshop on Food Waste Reduction and Recovery referenced in subtask 3.2.***	Showcasing real world examples will help raise awareness and can stimulate uptake of food waste reduction and recovery practices and processes where they are not yet in place, thereby reducing methane gas emissions from landfills. This work will also help assess if guidance on best practices is needed to further stimulate change, which could form the basis of future possible CEC work.	**Year 1**: Draft report (for use during workshop) **Year 2**: Finalize report (after the workshop) **Performance Measures/Indicators:** - Production of a report - Number and diversity of stakeholder sectors that participated in recovery and reduction information-gathering - Critical reception and uptake of the report by stakeholders - Number of times report is requested	Year 1: $60,000 Year 2: $20,000

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TASK #3) Identify opportunities to further advance food waste reduction and recovery in North America				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Identify gaps, challenges, opportunities and strategies to enhance food waste reduction and recovery in North America. [consultant assistance required]	A white paper identifying gaps, challenges, opportunities and strategies to enhance food waste reduction and recovery in North America, including consideration of measurement and monitoring approaches. The paper will include relevant options applicable to both governments and industry and commercial food sectors, and other institutional sources. It will also include consideration of approaches outside North America, where relevant. The paper will also identify possible options to recognize organizations in industry and commercial food sectors for leadership and excellence in addressing food waste reduction and recovery in North America. ***A draft white paper will be shared at the North American Workshop on Food Waste Reduction and***	The white paper will identify potential problems and solutions to foster enhanced food waste reduction and recovery in North America, which can be used to stimulate future work to support methane emission reductions from landfill disposal.	**Year 1**: Draft paper (for use during workshop) **Year 2**: Finalize paper (after the workshop) **Performance Measures/Indicators:** - A white paper is produced - Identification of realistic options for all targeted stakeholder groups - Stakeholder reactions regarding completeness and diversity of options presented - Number of times paper is requested	Year 1: $20,000 Year 2: $30,000

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	Recovery referenced in subtask 3.2.			
3.2 Host a North American Workshop on Food Waste Reduction and Recovery to share and discuss relevant approaches and opportunities for reducing food waste, and provide a forum to critique the three draft reports and draft white paper. [consultant assistance required] Consultant will contribute to workshop design, communication and outreach; workshop facilitation; and a report on deliberations and recommendations from the workshop.	Face-to-face multi-stakeholder discussions regarding the draft study, guidance and the papers developed under this project. Workshop report that summarizes key issues, deliberations and recommendations for each agenda item from the workshop. A separate document will summarize comments regarding the three draft reports and the white paper referenced in subtasks 1.1, 2.1, 2.2 and 3.1.	The workshop will foster collaboration among government, industry, academia and other experts that have roles to play in food waste reduction and recovery, and provide a forum to share and discuss best practices, policies, tools and other approaches. It will also provide an opportunity to raise awareness and stimulate interest in and encourage further engagement on food waste reduction and recovery, which can contribute to methane emission reductions from landfill disposal.	**Year 1**: Initial workshop design **Year 2**: Hold one workshop **Performance Measures/Indicators:** - An experts workshop is held - Number of workshop participants and diversity of stakeholder organizations - Quality of participant feedback regarding draft reports and papers - Results of workshop evaluation questionnaire	Year 1: $19,000 Year 2: $79,000 **Notes:** 4-day event is envisaged Budget includes costs for: a) consulting b) simultaneous translation services c) travel for select nongovernmental and nonindustrial stakeholders (e.g., academia, hunger relief organizations, ENGOs)
TASK #4) Share knowledge on food waste reduction and recovery				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
4.1 Develop a clearinghouse mechanism or online information sharing platform to communicate knowledge, approaches and opportunities for food waste	Clearinghouse mechanism or online information sharing platform on food waste reduction and recovery, to be hosted on the CEC website (or a volunteer stakeholder website), as	Clearinghouse will provide a tool for governments, industry and others to share knowledge and information to help others advance food	**Year 2**: Complete the development of information clearinghouse **Performance**	Year 1: $0 Year 2: $20,000

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reduction and recovery. [consultant assistance required]	determined by the steering committee	waste reduction and recovery (and support methane emission reductions from landfill disposal)	**Measures/Indicators:** - An information clearinghouse is delivered - Number of visitors to the site - Number of document downloads	
4.2 Translate project outputs intended for public dissemination	Translation of reports, papers, presentations and other project outputs (e.g., tasks 1–3)	Translation of project outputs intended for public dissemination will support knowledge building and raise awareness in the three countries	**Year 1:** Translate draft papers (for use at workshop) **Year 2:** Translate final papers **Performance Measures/Indicators:** - Translated documents - Project outputs are translated	Year 1: $10,000 Year 2: $40,000

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (See below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

  This project contributes to the CEC Council's *Climate Change* strategic priority for 2015–2020, under the *Short-lived Climate Pollution* subtheme, by reducing methane emissions from landfills through food waste reduction and recovery. The project is also linked to the *Green Growth–Sustainable Production and Consumption* cluster of projects, since project outcomes will also foster more sustainable production and consumption patterns in the three countries.

- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

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Food waste is both generated and predominantly landfilled in all three countries. This waste can account for 20 percent or more, by volume, of municipal solid waste disposed in landfills and is known to emit methane gas from the anaerobic environment of a landfill. As such, significant opportunities exist to curb short-lived climate pollutants (i.e., methane emissions) through the reduction and recovery of food waste across North America.

This project will provide important information to better understand the current situation of food waste generation in North America, encourage food waste reduction and recovery, and identify options to advance foster food waste reduction and recovery in North America, providing environmental, economic and social benefits.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

  Tangible results (i.e., outcomes) and performance measures are identified in the task table above.

- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking the project, considering these points:**
  - **The value-added of doing it under the CEC cooperative work program**

    The CEC has not yet undertaken work focused on food waste reduction and recovery. This project represents an opportunity to target this area to support mutual interests related to waste diversion from landfills, reducing climate pollutants, and addressing sustainable production and consumption patterns. A trilateral partnership will facilitate a coordinated and consistent approach that avoids duplication of effort and resources.

  - **Any other public, private or social organizations that work on such activities**

    A project subtask identifies stakeholder organizations and the roles they play in food waste reduction and recovery (also see last question below for a preliminary list of potential stakeholders).

  - **Opportunities to cooperate and/or leverage resources with such organizations**

    Efforts will be made to identify and encourage key stakeholder organizations that have a role to play in food waste reduction and recovery to participate in and contribute to this project to the extent that they are able.

- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

  Yes. The project proposes work that will be completed within a two-year timeframe.

  Project outcomes are anticipated to complement current and future initiatives such as US Food Waste and Recovery Challenges, initiatives of the Canadian Council of Ministers of the Environment on waste, and Mexican activities supporting sustainable consumption and production. Project outcomes can also feed into North American country contributions under the United Nations

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Framework Convention on Climate Change and the UN 10-year framework of programmes on sustainable consumption and production patterns, thereby raising the international profile of the CEC's project outcomes. It is also anticipated that organizations such as the Food Waste Reduction Alliance and the Canadian National Zero Waste Council will help to promote the project outcomes upon finalization in order to further raise awareness and foster uptake of good practices.

- **Where applicable, identify with reasonable specificity:**
  - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**

    Food waste reduction and recovery is a new area of trilateral cooperation and work for the CEC. This work supports two CEC Priorities under the 2015–2017 Strategic Plan, namely Climate Change (under the Short-lived Climate Pollutants subtheme) and Green Growth (under the Sustainable Production and Consumption subtheme). As noted in this proposal, direct efforts will be made to coordinate this work with that under the CEC organic waste diversion and processing project.

  - **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**

    The target audience for this work focuses on relevant North American industry, commercial and institutional sectors (e.g., food processing, wholesale, distribution and transport, grocers and restaurants, hospitals, schools and universities, nursing homes and prisons). Governments in the three countries are also anticipated to share and foster use of project outcomes through ongoing and/or future work programs, challenges, and other initiatives related to food waste reduction and recovery. Given the global and national importance of climate change and sustainable development issues, it is anticipated that the target audience will be receptive to project outcomes.

  - **The beneficiaries of capacity building activities that the project may include**

    It is anticipated that industry, commercial and institutional sectors, will benefit from direct cost savings from food waste reduction and recovery efforts. Communities will benefit from cleaner air and longer lasting landfills. All will benefit from enhanced industry and community engagement to reduce food waste and prevent them from entering landfills, and bolstering the availability of food at local food pantries through expanded access to food donations from industry, commercial and institutional food sectors.

  - **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

    Some of the foundation work under this project will identify potential stakeholder organizations that can contribute to successful project outcomes. A preliminary list of potential stakeholder organizations is identified below:

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Mexico:
- Semarnat

United States:
- US EPA
- US Department of Agriculture
- United States National League of Cities
- Food Waste Reduction Alliance
- Grocery Manufacturers Association
- National Restaurant Association
- National Grocers Association
- Feeding America

Canada:
- Environment Canada
- Canadian Council of Ministers of Environment
- Federation of Canadian Municipalities
- National Zero Waste Council
- Canadian Federation of Independent Grocers
- Canadian Council of Grocery Distributors
- Canadian Restaurant and Food Services Association
- Food Banks Canada

Others:
- Solid Waste Association of North America
- Climate and Clean Air Coalition
- Food Marketing Institute
- Food packers/processors and retailers

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Project 4: North American Initiative on Organic Waste Diversion and Processing	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$365,000 **Year 1: C$120,000** **Year 2: C$245,000**	

Strategic Priority/Subtheme

- Climate Change / Short-lived Climate Pollution
- Green Growth / Sustainable Production and Consumption

This project is positioned under the *Climate Change: Short-lived Climate Pollution* cluster, but also has linkages to the *Green Growth: Sustainable Production and Consumption* cluster.

How will this project address the cross-cutting themes?

The project will address the above cross-cutting themes by:

1. Identifying opportunities and methods for reducing methane emissions from landfills by diverting and processing organic waste for beneficial uses, and
2. Raising awareness regarding best practices and policy options for promoting the diversion and processing of organic waste.

Project Summary (including a clear statement of project goal)

Organic waste consists of carbon-based compounds that are derived from animal and plant materials such as food waste, yard trimmings, wood waste, and paper and paperboard products. In Canada, Mexico, and the United States, organic waste is predominantly sent to landfills, where it decomposes under anaerobic conditions, contributing to the formation and release of methane gas. Methane is a short-lived climate pollutant and greenhouse gas that is over 20 times more potent than carbon dioxide and that has an atmospheric lifetime of about 12 years.[10] Methane emissions from the waste sector in Canada, Mexico, and the United States represent 20[11], 6[12], and18[13] percent of total national methane emissions respectively.

According to the US EPA's latest figures on municipal solid waste generation, recycling, and disposal for 2012 in the US, organic waste

[10] UNEP. What are Short-Live Climate Pollutants? <www.unep.org/ccac/Short-LivedClimatePollutants/Definitions/tabid/130285/Default.aspx>.

[11] Government of Canada, 2014. Canada's Sixth National Report on Climate Change – Actions to Meet Commitments Under the United Nations Framework Convention on Climate Change.

[12] Semarnat. Programa Especial de Cambio Climático. 2014–18. México. <www.dof.gob.mx/nota_detalle.php?codigo=5342492&fecha=28/04/2014>.

[13] US EPA. n.d. Overview of Greenhouse Gases. <http://epa.gov/climatechange/ghgemissions/gases/ch4.html>.

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(including food waste, paper/paperboard, yard trimmings, and wood) accounted for about 63 percent of municipal solid waste disposed in landfills.[14] In Canada, approximately 33 million tonnes of residential and non-residential waste was generated in 2010, of which about 76 percent (25 million tonnes) was disposed of, mostly in landfills,[15] while about 16 percent was diverted (2.2 million tonnes of organic waste and 3.2 million tonnes of paper waste).[16] In Mexico in 2011, about 5 percent of the total waste stream was directed to recycling or composting, with the remaining 95 percent of the waste stream disposed in landfills.[17]

In all three countries, organic waste represents a significant component of the waste stream that can be diverted from landfills to other waste management approaches such as composting, anaerobic digestion, and other organic waste processes, which would contribute to significant reductions in short-lived climate pollutants and provide other benefits. Doing so would also reinforce ongoing efforts in support of the United Nations Framework Convention on Climate Change, to which Canada, Mexico, and the United States are parties. Diversion and processing of these wastes would also help to preserve landfill space and reduce the formation of leachate and odors at landfill sites. It is equally recognized that diverting and processing organic waste contributes to sustainable development goals, including sustainable material management and resource efficiency, with linkages to CEC priorities (i.e., green growth), other international commitments (e.g., UN 10-year framework of programmes on sustainable consumption and production patterns), and various national initiatives (e.g., US Biogas Opportunities Roadmap, Canadian Council of Ministers of the Environment work on organic waste diversion, and Mexican general policies on sustainable consumption and production, clean production, and organic waste).

The goal of this project is to identify barriers, opportunities and solutions related to increasing organic waste diversion and processing capacity in North America. The project will focus on organic waste collection/segregation, and organic waste processing (e.g., composting, anaerobic digestion, and other organic waste processing technologies). The scope will include organic wastes generated in the residential and the industrial, commercial and institutional (IC&I) sectors. Through consultations within the project working group, determinations will also be made on how to best consider organic waste from wastewater management (biosolids) or manure management when these become part of a mixed waste feedstock for anaerobic digestion or composting. The project will also complement work proposed under the North American Partnership on Food Waste Reduction and Recovery.

The proposed work is as follows:

- **Gather foundational knowledge and information to better understand the current situation for organic waste diversion and processing in North America by:**
    - Consolidating information on existing organic waste diversion programs and processing facilities in North America and select

[14] US EPA. February 2014. *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2012.* EPA-530-F-14-001. <www.epa.gov/solidwaste/nonhaz/municipal/pubs/2012_msw_fs.pdf>.

[15] Statistics Canada. 2013. Waste Management Industry Survey: Business and Government Sectors. <www.statcan.gc.ca/pub/16f0023x/2013001/aftertoc-aprestdm1-eng.htm>.

[16] Statistics Canada. CANSIM Table 153-0043: Materials diverted, by type, Canada, provinces and territories. <www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=1530043&pattern=153-0041..153-0045&tabMode=dataTable&srchLan=-1&p1=-1&p2=31>.

[17] OECD. Environment at a Glance 2013. Table 1.13, Municipal waste disposal and recovery shares, 2011. <www.oecd-ilibrary.org/sites/9789264185715-en/01/11/index.html?itemId=/content/chapter/9789264185715-15-en>.

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OECD countries;
- Compiling existing policies, regulations, best practices, information on economic/market forces, and other factors that impact organic waste diversion and processing, from North American and select OECD countries;
- Identifying factors that have contributed to successful organic waste diversion and processing initiatives;
- Estimating current and potential reductions in short-lived climate pollutants achieved/achievable through organic waste diversion in the three countries;
- Establishing a tele-network with experts in organic waste diversion and processing in the three countries, for the duration of this project; and
- Tele-networking with the CEC project group responsible for the North American Partnership on Food Waste Reduction, for the duration of this project.

- **Identify barriers, opportunities and potential solutions related to increasing organic waste diversion, processing capacity, and associated market opportunities in North America by:**
  - Developing a white paper that identifies barriers, opportunities, and potential solutions; and
  - Conducting a series of stakeholder consultations, either via webinar or face-to-face, to validate the findings of the foundation report(s) and white paper, and to analyze the identified barriers, opportunities and potential solutions.

- **Share knowledge on organic waste diversion and processing by:**
  - Developing a clearinghouse mechanism or online information-sharing platform to communicate knowledge, policy options, best practices, and tools (in coordination with work proposed under the North American Partnership on Food Waste Reduction).

Short-term Outcomes (at halfway point)
- Draft report(s) to consolidate knowledge and information regarding the current situation for organic waste diversion and processing in the three countries, and identification of factors that have led to successful organic waste diversion and processing initiatives in North America and other OECD countries
- Information on the impact of organics diversion and processing (current and potential) on reducing short-lived climate pollutants
- Network of experts involved in organic waste diversion and processing in the three countries
- A draft white paper identifying barriers, opportunities and potential solutions related to increasing organic waste diversion and processing capacity in North America

Long-term Outcomes (by the end of the project)
- Findings and recommendations from a series of stakeholder consultations analyzing barriers, opportunities and potential solutions related to increasing organic waste diversion and processing capacity in North America
- Potential new strategic partnerships to encourage and promote increased organic waste diversion and processing in North America
- Finalization of the draft report(s) and white paper mentioned above, based in part on recommendations emerging from the stakeholder consultations
- Clearinghouse mechanism or on-line information sharing platform, hosted on the CEC website (or a volunteer stakeholder website),

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on organic waste diversion and processing

Longer-term, Environmental Outcome (post-project)

This project represents a first step by the CEC to undertake focused work on organic waste diversion and processing. It will enhance diversion and processing of organic waste within North American communities, businesses, and industries and ultimately reduce methane emissions from landfills. Given that organic waste may represent over two-thirds of waste disposed in landfills, diverting these wastes through composting, anaerobic digestion, and other organic waste processing technologies, in addition to source reduction, will also extend the service lives of existing landfills, offsetting the need (and associated costs) to site and construct new ones. The project will also support potential market expansion for organic waste diversion and processing technologies and services.

As a whole, the project will help Canada, Mexico, and the United States achieve international and national commitments regarding both climate change and sustainable development. Through the collaboration of experts in the three countries, the project will reduce duplication of efforts, harmonize approaches to improving organic waste reduction, diversion and processing, and contribute to the uptake of policies and best practices that can be applied in all three countries. It will also contribute important baseline information to better understand the types, quantities, and current management of organic waste in North America, and identify options for improving organic waste diversion and processing in North America. While the project will foster collaboration among communities, business, industry, and other experts with roles to play in organic waste diversion, additional CEC work may be required to address a wider spectrum of opportunities in the future.

Performance Measures (quantified SMART measures)

Performance measures/indicators are identified in the table below.

Tasks necessary to reach the environmental outcome:

1) Gather foundational knowledge and information to better understand the current situation for organic waste diversion and processing in North America.
2) Identify barriers, opportunities and potential solutions related to increasing organic waste diversion and processing in North America.
3) Share knowledge on organic waste diversion and processing.

Task #1) Gather foundational knowledge and information to better understand the current situation for organic waste diversion and processing in North America.

Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing and Performance Measures/Indicators**	**Budget (C$)** (activities)
1.1 Consolidate information on existing organic waste diversion programs and processing facilities in North America and select OECD countries.	A report consolidating information on existing organic waste diversion programs and processing facilities for residential and IC&I waste in North America	The report will contribute to developing a better understanding of the current situation for organic waste diversion and processing in the	**Year 1**: Begin draft report (for use during stakeholder consultations). **Year 2**: Complete draft	**Year 1**: $79,000 **Year 2**: $20,000

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[consultant assistance required]	and select OECD countries. For organic waste diversion programs, this will include an inventory of municipal and private-sector programs with information such as diversion rates achieved, costs, and factors that have led to success. For organic waste processing facilities, this will include an inventory with information such as type of technology/process used, waste types processed (including mixing with wastes from other sources such as municipal wastewater for manure management systems), throughput values, costs and revenues, markets for products, and factors that have led to success. The report will also include an inventory of key stakeholders in North America and location maps depicting existing organic waste processing facilities in North America. The report will, to the extent practical, rely on existing studies and information; however, since organic waste diversion and processing may be more developed in Canada and the US, this task may include deeper data gathering and analysis for the situation in Mexico.	three countries. It will provide information that will help establish a basis and rationale for subsequent tasks and subtasks aimed at reducing methane emissions from landfill. This work will also inform countries where limitations, gaps, and opportunities may exist with respect to increasing organic waste diversion and processing. The draft report will be consolidated for presentation during the stakeholder consultations discussed in subtask 2.2.	report and then finalize report after stakeholder consultations. **Performance Measures/Indicators:** - A report is produced - Number and diversity of stakeholder sectors initially consulted - Inventories of organic waste diversion programs and processing facilities are produced - Percentage of programs and facilities identified	

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1.2 Compile existing policies, regulations, best practices, information on economic/market forces, and other factors that impact organic waste diversion and processing, from North American and select OECD countries. [consultant assistance required]	A report compiling information on existing policies, regulations, best practices, information on economic/market forces, and other factors that impact organic waste diversion and processing, from North American and select OECD countries. Will also include an inventory of key stakeholders and will identify the factors that have contributed to successful organic waste diversion and processing initiatives.	The study will provide baseline information on the diversity of policies, market forces and other factors that impact organic waste diversion and processing in North America and will inform the three countries where limitations, gaps and opportunities may exist. The draft report will be consolidated for presentation during the stakeholder consultations discussed in subtask 2.2.	**Year 1**: Begin draft report (for use during stakeholder consultations). **Year 2**: Complete draft report and then finalize report after stakeholder consultations. **Performance Measures/Indicators:** - A report is produced - Number and diversity of stakeholder sectors initially consulted	**Year 1**: $40,000 **Year 2**: $10,000
1.3 Estimate current and potential reductions in short-lived climate pollutants achieved/achievable through organic waste diversion and processing in the three countries. [consultant assistance required]	A report examining the potential impact of organic waste diversion and processing on reducing short-lived climate pollutants in North America. Would make use of outputs from subtask 1.1 and other available information on existing and potential organic waste processing facilities. [Would make use of information on organic waste generation and diversion that would be collected through the proposed North American Partnership on Food Waste Reduction, if	The report will provide information on the impact of organic waste diversion and processing on reducing short-lived climate pollutants and help establish a basis and rationale for subsequent tasks and subtasks aimed at reducing methane emissions from landfills. The draft report will be consolidated for presentation during the stakeholder consultations discussed in subtask 2.2.	**Year 2**: Draft report for use in stakeholder consultations and later finalization **Performance Measures/Indicators:** - A report is produced - Number and diversity of stakeholder sectors initially consulted	**Year 1**: $0 **Year 2**: $30,000

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	that project proceeds.]			
1.4 Establish a tele-network with experts in organic waste diversion and processing in the three countries, for the duration of this project. [regular conference calls]	A network of experts involved in organic waste diversion and processing in the three countries	The network will ensure a means through which industry and other experts can contribute to the identification of problems and potential solutions related to organic waste diversion and processing (and support methane reductions at landfills).	**Year 1**: Formation of a network **Year 2**: Continued networking **Performance Measures/Indicators:** - Conference calls are held - Number and timing of conference calls - Number of participating stakeholder organizations during calls	**Year 1**: $500 **Year 2**: $500
1.5 Conduct tele-networking with the CEC inter-governmental project group responsible for the North American Partnership on Food Waste Reduction, for the duration of this project. [periodic conference calls]	A network with the CEC inter-governmental project group responsible for the North American Partnership on Food Waste Reduction [NB: It is anticipated that some (but not all) government representatives for the two CEC projects will be the same.]	The network will provide a means through which government representatives of the two project groups can discuss cross-cutting issues and avoid potential duplication of efforts and resourcing through contracts or other work and activities.	**Year 1**: Formation of a network **Year 2**: Continued networking **Performance Measures/Indicators:** - Conference calls are held - Number and critical timing of conference calls	Year 1: $500 Year 2: $500

Task #2) Identify barriers, opportunities and potential solutions related to increasing organic waste diversion and processing in North America.				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Identify barriers, opportunities, and potential solutions related to increasing organic waste diversion and processing in North America. [consultant assistance required]	A white paper identifying barriers, opportunities and potential solutions related to increasing organic waste diversion and processing in North America. The paper will focus on relevant policy options and instruments for industry and government, outstanding needs for best practices and tools, and partnership opportunities. The paper will examine factors that are/were in place that have allowed for successful implementation of existing programs and facilities (i.e., the specific mix of policies, incentives, market factors, etc.). It will also examine the reasons why more projects have not proceeded and options that could be considered by stakeholders to increase the number and scale of organic waste diversion programs and processing facilities in North America. Case studies in each country will be highlighted.	The white paper will identify barriers, opportunities and solutions related to fostering increased organic waste diversion and processing (and supporting methane reductions at landfills) in North America. The draft paper will be discussed and validated through a series of stakeholder consultations outlined in subtask 2.2.	**Year 2**: Draft white paper for use in stakeholder consultations and later finalized **Performance Measures/Indicators:** - A white paper is produced - Identification of realistic options for targeted stakeholder groups - Stakeholder reactions regarding completeness and diversity of options presented	**Year 1**: $0 **Year 2**: $50,000

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2.2 Hold stakeholder consultations, either via webinar or face-to-face, to validate the findings of the draft foundation report(s) and white paper, and analyze barriers, opportunities and potential solutions related to increasing organic waste diversion and processing in North America. [consultant/facilitation assistance required]	Findings and recommendations from a series of stakeholder consultations in each country, analyzing barriers, opportunities and potential solutions related to increasing organic waste diversion and processing. This may include targeted discussions with state and local governments, IC&I sector representatives, organic waste processing facility owners and operators, electrical and natural gas utilities (with respect to anaerobic digestion), technology providers, academics, non-governmental organizations, etc. The consultant will contribute to consultation design, communication, outreach, and facilitation and will report on deliberations and recommendations from the consultation events.	Consultations will enhance collaboration among government, industry, academia, and other experts with roles to play in organic waste diversion and processing, and provide a forum to discuss policies and analyze the barriers, opportunities and potential solutions related to increasing organic waste diversion and processing in North America.	**Year 2**: Design and deliver up to three 1-day webinars or face-to-face meetings in each country. **Performance Measures/Indicators:** - Stakeholder consultations are conducted - Number of participants and diversity of stakeholder organizations - Level and quality of stakeholder interaction - Final report on stakeholder consultation is produced.	**Year 1**: $0 **Year 2**: $74,000

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Task #3) Share knowledge on organic waste diversion and processing.				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Develop a clearinghouse mechanism or on-line information-sharing platform to communicate knowledge, policy options, best practices, and tools. [consultant assistance required]	A clearinghouse mechanism or on-line information-sharing platform, hosted on the CEC website (or a volunteer stakeholder website) on organic waste diversion and processing [This would be coordinated with a similar effort in the North American Partnership on Food Waste Reduction proposal.]	The clearinghouse will provide a tool for governments, industry, and others to share knowledge and information to help others advance organic waste diversion and processing (and support methane reductions at landfills).	**Year 2**: Complete development of information clearinghouse **Performance Measures/Indicators:** - Reports, white papers, and inventories are published - Number of requests to receive reports, white papers and inventories - Level of community and industry engagement in contributing to and updating clearinghouse	Year 1: $0 Year 2: $20,000
3.2 Translate project outputs intended for public dissemination.	Translation of reports, white papers, presentations and other project outputs from tasks 1 and 2	Translation of project outputs intended for public dissemination will support knowledge-building and raise awareness in the three countries.	**Year 2:** Translation of project outputs **Performance Measures/Indicators:** - Documents are translated - Number of requests to receive translated reports, white papers and inventories	Year 1: $0 Year 2: $40,000

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Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

This project contributes to the CEC 2015–2020 Strategic Plan under the *Climate Change – Short-lived Climate Pollution* cluster of projects by mitigating methane emissions from landfills through organic waste diversion and processing. The project is also linked to the *Green Growth - Sustainable Production and Consumption* cluster of projects since project outcomes related to organic waste diversion and processing will also foster more sustainable consumption and production patterns in the three countries.

- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

Organic waste is generated and predominantly landfilled in all three countries. These wastes can account for 65 percent or more of municipal solid waste and a large majority of the methane produced from landfills. As such, significant opportunities exist to curb short-lived climate pollutants (i.e., methane emissions) through organic waste diversion and processing across North America.

This project will provide important information to better understand the current situation of organic waste diversion and processing in North America and identify barriers, opportunities and potential solutions related to increasing organic waste diversion and processing in North America. It will also develop a clearinghouse mechanism to facilitate the exchange of knowledge and information on organic waste diversion and processing in North America.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

Tangible results (i.e., outcomes) and performance measures are identified in the table above.

- **Explain why the CEC is the most effective vehicle for the Parties to undertake the project, considering these points:**
    - **The value-added of doing it under the CEC cooperative work program**

The CEC has not yet undertaken focused work on organic waste diversion and processing. This project represents an opportunity to target these wastes to support mutual interests related to waste diversion from landfills, reducing climate pollutants, expanding infrastructure and

markets for organic waste diversion and processing, energy generation from anaerobic digestion (biogas), and sustainable production and consumption patterns. A trilateral partnership will facilitate a coordinated and consistent approach that avoids duplication of effort and resources.

- **Any other public, private or social organizations that work on such activities**

A project subtask identifies stakeholder organizations and the roles they play in organic waste diversion and processing for beneficial uses (see last question below for a preliminary list of potential stakeholders). Part of this work will also identify and cumulate existing guidance and best practices to ensure compatibility and avoid duplication with these approaches.

- **Opportunities to cooperate and/or leverage resources with such organizations**

Engagement with stakeholder organizations is critical to producing successful outcomes under this project. Consequently, efforts will be made to identify and encourage key stakeholder organizations that have a role to play in organic waste diversion and processing to participate in and contribute to this project to the extent that they are able.

- **Does the project propose a clear timeline for implementation of the activities, including a target end date for CEC's involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

Yes. The project proposes work that will be completed within a two-year timeframe. Related work is anticipated to continue after CEC involvement ends. For example, project outcomes are anticipated to complement initiatives such as US Recovery Challenges and the US Biogas Opportunities Roadmap, as well as the Canadian Council of Ministers of the Environment work on organic waste diversion. Project outcomes can also feed into North American country contributions under the United Nations Framework Convention on Climate Change and the UN 10-year framework of programmes on sustainable consumption and production patterns, thereby raising the international profile of the guidance and on-line information-clearinghouse. It is also anticipated that organizations such as US and Canadian composting associations and the Zero Waste Council will help to promote project outcomes upon their finalization in order to further raise awareness and foster uptake of best practices.

- **Where applicable, identify with reasonable specificity:**

  - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**

Organic waste diversion and processing is a new area of trilateral cooperation and work for the CEC. However, this work supports two CEC Priorities under the 2015–2017 Strategic Plan, namely Climate Change (under the Short-lived Climate Pollutants subtheme) and Green Growth (under the Sustainable Production and Consumption subtheme).

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- **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**

Given the global and national importance of climate change and sustainable development issues, it is anticipated that the target audience will be receptive to project outcomes. The target audience for this work includes communities, the IC&I sector, and the organic waste diversion and processing industry. Governments in the three countries are also anticipated to share and foster use of project outcomes through ongoing and/or future work programs, challenges, and other initiatives related to organic waste diversion and processing.

- **The beneficiaries of capacity building activities that the project may include**

It is anticipated that the organic waste diversion and processing sector will also benefit from industry growth and profits from enhanced organic waste diversion and processing. Communities will benefit from cleaner air and longer lasting landfills. All will benefit from enhanced industry and community engagement to divert organic wastes from landfills.

- **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

The development of the white paper and other project outputs will involve multiple stakeholder organizations, including the food industry, the composting industry, governments, NGOs, and academia. Some of the foundation work under this project will identify potential stakeholder organizations (including state and local governments, IC&I sector representatives, organic waste processors, associations, academia, and other non-government organizations) that can contribute to successful project outcomes. A preliminary list of potential stakeholder organizations is identified below:

Mexico:
- Semarnat
- INECC
- *Asociación Mexicana de Biomasa y Biogás*
- *Asociación Mexicana de Energía*

United States:
- US EPA
- Collaborators on the US Biogas Opportunities Roadmap (including USDA and DOE)
- United States National League of Cities
- US Composting Council

Canada:
- Environment Canada
- Canadian Council of Ministers of Environment
- Compost Council of Canada
- Federation of Canadian Municipalities
- National Research Council
- Biogas Association

Others:
- Solid Waste Association of North America
- Climate and Clean Air Coalition

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Project 5: North American Blue Carbon: Next Steps in Science for Policy	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$620,000 **Year 1: C$305,000** **Year 2: C$315,000**	

Strategic Priority/Subtheme

- Climate Change Mitigation and Adaptation / Blue Carbon (Coastal and Marine Ecosystems)
- Sustainable Communities and Ecosystems / Priority Species and Ecosystems; Landscapes and Seascapes; and Sustainable Communities

This project falls within the Climate Change Mitigation and Adaptation strategic priority, and specifically the Blue Carbon (Marine and Coastal Ecosystems) strategic objective within this priority. It supports work to map coastal habitats, in particular seagrass meadows, and develop approaches to conserve and restore blue carbon ecosystems. This project builds on and complements previous work on forest and coastal/marine carbon cycle research, to obtain an improved understanding of the current and future role of these ecosystem-based systems in North America's carbon cycle. This project also helps to enhance information-sharing and communication by continuing to strengthen the North American Blue Carbon Community of Practice, which was established with the first CEC blue carbon project (Phase 1, 2013–2014), and it builds on the outcomes of the JPAC's November 2014 meeting on "North America's Coasts in a Changing Climate."

Throughout North America, coastal/marine ecosystems play an important role in national greenhouse gas budgets, and there are large regional differences in the distribution of carbon sources and sinks. Understanding the current and projected future roles of these systems in North America, including the impacts of management and climate change, is required in order to inform sustainable management of carbon sinks in coastal/marine ecosystems.

The results of the project will contribute to improved management of these systems, in order to protect and manage sinks and reduce sources and to achieve climate change mitigation objectives. As blue carbon habitats also have a wide range of other ecosystem benefits, including fish and wildlife habitat, nurseries for shellfish, fish, and corals, protection from flood and storm-caused tidal surges, and water quality improvement, the project also addresses the Priority Species and Ecosystems, Landscapes and Seascapes and Sustainable Communities subthemes by supporting the improved management of transboundary landscapes and seascapes. Shared information about the science, management, and policy opportunities (including federal policies and market-based opportunities) will improve management and resiliency of coastal areas in all three countries.

Lastly, the blue carbon and forest carbon projects of the CEC have similar objectives and have already started to coordinate activities pertaining to mangrove forests. Some of the carbon accumulating in aquatic systems originates from upstream land ecosystems, and management, land use and disturbance of those ecosystems can affect carbon (C) accumulation rates in blue carbon systems. Both projects will create opportunities in the next two years for further cooperation and synergies among the two related land and marine sectors.

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How will this project address the cross-cutting themes?

- *Learning from and assisting vulnerable groups and indigenous communities.*

Conservation of blue carbon habitats supports sustainable livelihoods for local and indigenous communities not only in local fisheries, since those ecosystems are important nurseries and refuge habitats for shellfish, fish, and corals, but also by supporting enhanced recreation/tourism in blue carbon ecosystems. There are additional co-benefits of blue carbon ecosystem conservation that promote sustainable coastal communities, including wave and erosion protection (less damage during storms), as well as water quality improvements. These co-benefits can improve the livelihoods of vulnerable groups and indigenous communities throughout North America.

- *Enhancing information-sharing, transparency, capacity building, and communication.*

This project helps to enhance information-sharing and communication by continuing to strengthen the North American Blue Carbon Community of Practice, which was established during the first CEC blue carbon project (Phase I). In order to strengthen and grow the community of practice, two workshops will be part of this project. In addition, the project will build on the products from the first CEC blue carbon project, which include: a comprehensive set of maps of blue carbon ecosystems; data generated from on-the-ground research; expanded guidelines for coastal managers about best practices to protect, manage and restore blue carbon habitats that included a wide geographic scope and up-to-date science; and the continued development of market opportunities for blue carbon ecosystems. The project will also collaborate with national experts, including those in the CEC-funded projects on land-cover change and forest carbon, and with academic and nongovernmental networks and the North American Carbon Program (NACP).

Project Summary (including a clear statement of project goal)

This project has a five-year goal aligned with the CEC's 2015–2020 Strategic Plan and other international initiatives related to greenhouse gas accounting and to climate change adaptation and mitigation. The project goal is that by 2020, the three countries will have advanced protocols to develop and apply conservation and restoration approaches for promoting carbon sequestration in coastal and marine blue carbon ecosystems. To achieve this, the project will seek to: identify and fill scientific and mapping gaps for blue carbon habitats, with a particular focus on seagrass meadows, which are the least well-mapped and least well-understood of the three blue carbon ecosystems. It will also identify policy opportunities for applying blue carbon science and tools to better conserve and restore coastal and marine habitats; advance methodologies to protect or restore blue carbon habitats, including serving as a model for countries seeking to implement carbon credits for blue carbon habitat conservation and restoration; and further develop the North American Blue Carbon Community of Practice. For 2015–2016, the project will build on activities conducted in Phase I, and will advance the science and policy needed to protect these habitats and promote more-sustainable and more-resilient coasts.

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Short-term Outcomes (at halfway point)

1. Application of a harmonized protocol, with site-specific methods and an agreed-upon terminology to map seagrass meadows.
2. Comprehensive analysis and improved understanding of the notion of coastal system permanency as it relates to the development of a conservation methodology to conserve threatened coastal wetlands through market-based mechanisms and other opportunities.
3. Facilitated trinational communication and information exchange among the scientific and policy communities, through a workshop.

Long-term Outcomes (by the end of the project)

1. Shared geospatial data and maps of seagrass meadows in all three countries (5 new sites total), in specific priority regions; this will fill gaps identified in Phase I.
2. Shared carbon data in the newly mapped seagrass meadows. Carbon data will include carbon stored in soils under seagrasses, depth of soil, and sequestration rates of carbon by the seagrass plants.
3. Enhanced understanding through shared lessons and analyses, for all three countries, of the federal, international and market-based opportunities for blue carbon integration into existing or potential policies across North America.
4. Facilitated trinational communication and information exchange among the scientific and policy communities, through a stronger North American Community of Practice for Blue Carbon.

Longer-term, Environmental Outcomes (post-project)

1. Enhanced coastal conservation and restoration, due to changes in management of coastal ecosystems.
2. Increased opportunities for leveraging national and international climate mitigation, or adaptation, into environmental policy or legislation that increases coastal ecosystem conservation.
3. More support, through market-driven funding, for coastal conservation and restoration projects.
4. Enhanced awareness in all three countries of the multiple benefits (including carbon sequestration and storage) of coastal ecosystems.

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Performance Measures (quantified SMART measures)

Outcomes	Measures	Target	Indicator
Shared geospatial data and maps of seagrass meadows in all three countries, in specific priority regions. Shared carbon data data on seagrass carbon storage (in soils) and sequestration (in plants).	Number of new maps (5 new areas) of key seagrass blue carbon ecosystems in all three countries, in locations that have been identified as gaps, which are made publicly available. New soil carbon data for each of the 5 newly mapped seagrass areas.	100% of available geospatial data from reliable sources, in the three countries, combined and released. All new carbon data collected released in a format that is easily understood. Potentially work to publish these data in the peer-reviewed literature.	Increase in the number of blue carbon maps, especially seagrass maps, available through the CEC. Increase the seagrass carbon storage and sequestration data available for North America by adding data from 5 new seagrass sites.
Shared conservation methodology to conserve threatened wetlands, through market-based mechanisms and other opportunities	Completion of the conservation methodology to enable the protection of threatened wetlands, and thus secure avoided-emissions credits for habitats that are threatened by coastal development	Completed conservation methodology to conserve threatened wetlands through market-based mechanisms	Availability of conservation methodology in the public domain
Enhanced understanding, through shared lessons and analyses, in all three countries, of the federal, international and market-based opportunities for blue carbon integration into existing or potential policies across North America	Publication of shared lessons and analyses, in all three countries, of the federal, international and market-based opportunities for blue carbon integration	Final report 100% complete and disseminated	Report made available to the public
Facilitated trinational communication and information exchange among the scientific and policy communities, through a stronger North American Community of Practice for Blue Carbon	Number of participants at workshops and participating in CEC work, by region/country, area of expertise, and organization/agency collaboration of scientists, in the three countries	Involvement of 75% of the subject-matter experts identified by the three countries, in reviewing and consulting on trinational blue carbon work	Increased numbers of experts participating in CEC work, since Phase 1 of the project, with an increased focus on seagrass-mapping experts and seagrass-science experts

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Tasks necessary to reach the environmental outcomes

1) Support mapping and scientific efforts in seagrass meadows, in order to fill key gaps in our understanding of the extent and condition of seagrass ecosystems, in all three countries
2) Support policy analyses to determine the most important policy drivers/opportunities for blue carbon ecosystem conservation and restoration in each country (including market, federal and international policy opportunities) and continue the development of market opportunities for blue carbon ecosystems
3) Develop a strong community of practice and outreach and prepare communication materials for targeted audiences, including decision-makers, managers and coastal communities

Task #1) Blue Carbon Science and Mapping

Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Improve mapping and geospatial data for seagrass ecosystems, specifically targeting areas of high priority for acquiring new data in each country. This will include holding a small workshop with all the seagrass experts in each country to identify the target areas and develop appropriate methods for mapping in each country (since the different types of seagrass habitat are likely to require somewhat different methods in Mexico versus in Canada and the US). Each mapping effort can also be funded to collect some basic carbon sequestration and storage	Develop new maps of key seagrass meadows, in all three countries, in locations that have been identified as priorities and gaps, building on the work done in Phase I of this project. Work would include 2 sites in Mexico, 1 in Canada and 1 in the US, as well as one additional site to be identified by the seagrass experts and based on priority gaps identified in the mapping effort completed in Phase I of the blue carbon project. Carbon measurements will accompany the new mapping efforts. Each of the four sites (2 in Mexico, 1 in Canada, and 1 in the US)	This will improve our understanding of the extent and condition of seagrass ecosystems across all three countries, in order to better manage and conserve these critical ecosystems that tend to be understudied and undervalued.	In the first year, hold the workshop and then support the creation of new maps, which may involve fieldwork or remote sensing or other techniques to map areas that are gaps identified in Phase I of this project. By the end of year 2, translate and publish new maps combined with other CEC blue carbon maps from Phase I.	Year 1: $165,000 Year 2: $185,000

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data in the newly mapped seagrass areas, in order to increase our understanding of carbon dynamics in seagrass ecosystems since, of the three blue carbon ecosystem types, seagrasses have shown some of the highest variability in sequestration and storage rates. (Additional high-priority data gaps [e.g., salt marshes in Canada] will also be considered.)	and potentially the additional 5th site, if funds allow, will be given additional funds (up to ~$20,000 per site) for measuring carbon sequestration and storage in the newly mapped seagrass areas. Carbon measurements should include measurements of soil carbon content and bulk density in cores taken to at least 1 meter depth, total depth of soils, and rates of carbon sequestration (plant uptake).			
Task #2) Blue Carbon Policy				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Complete analyses in all three countries, but with a particular focus on Canada and Mexico, of the federal and international policy opportunities for blue carbon integration into existing or potential policies (may include regional, local case studies), in order to share lessons across North America. This would include an analysis of how market mechanisms (such as the voluntary carbon market)	A summary of existing Mexico and Canada national policies where blue carbon could be incorporated into the implementation of policies. This will be comparable to a similar effort already completed in the US which has paved the way for including carbon services of ecosystems in US priorities and efforts. Also, a review of market and international opportunities and how each of the three countries could	These analyses are key to helping each country determine what policy tools it already has that can be leveraged to conserve or restore blue carbon ecosystems, including federal, market-based, or international opportunities. Because of differences in the way that market or international policies may apply, it is important	These studies would be conducted in year 1 so that results could be shared at the workshop in year 2 with the whole community of practice.	Year 1: $30,000 Year 2: $20,000

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can be leveraged in each country. It would also include an analysis of how each country may or may not be able to participate in international policies, such as the UNFCCC mechanisms, and whether the protocols under development for the Verified Carbon Standard (VCS) could be used to support participation in programs such as the Clean Development Mechanism (CDM) or Nationally Appropriate Mitigation Actions (NAMAs).	engage in those policies.	to examine and identify the key opportunities for each country individually, to ensure each country understands the best policy tools available to it for conserving and restoring coastal ecosystems.		
2.2 Support the development of a methodology for carbon storage from wetland conservation, initially scoped in Phase 1 of this project. Once verified, this will be an accepted reference for securing carbon credits under a voluntary carbon system for wetland protection.	Conservation methodology for carbon storage from wetlands	The conservation methodology will enable the conservation of threatened wetlands and thus secure avoided-emissions credits for habitats that are threatened by development of some kind. This is a key step toward protecting more intact, healthy blue carbon ecosystems before they get degraded or destroyed.	Year 1 Year 2	Year 1: $35,000 Year 2: $35,000

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Task #3) Blue Carbon Community of Practice				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Collaborate and share lessons learned among blue carbon experts in North America, through blue carbon workshops and outputs; include new partners, such as blue carbon experts in academic and nonprofit institutions, and indigenous experts.	Two face-to-face workshops to share results of science projects and policy analyses to inform decision-making, in all three countries Build collaborations and trinational projects	Sharing expertise and results will make sure that progress made in each country can be used to help expand blue carbon efforts in all three countries	One workshop in each year	Year 1: $75,000 Year 2: $75,000

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

This project falls within the Climate Change Mitigation and Adaptation strategic priority, and specifically the Blue Carbon (Marine and Coastal Ecosystems) strategic objective within this priority. It supports work to map coastal habitats, in particular seagrass meadows, and to develop approaches to conserve and restore blue carbon ecosystems. This project builds on and complements previous work on forest and coastal/marine carbon cycle research, to obtain an improved understanding of the current and future roles of these ecosystem-based systems in North America's carbon cycle. This project also helps to enhance information-sharing and communication by continuing to strengthen the North American Blue Carbon Community of Practice, which was established with the first CEC blue carbon project (Phase 1, 2013–2014) and build on the outcomes of JPAC's November 2014 meeting on "North America's Coasts in a Changing Climate."

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Globally, terrestrial and marine ecosystems over the past two decades have annually removed from the atmosphere over 50% of the carbon emissions from human sources, such as those from the burning of fossil fuels and from deforestation. Throughout North America, coastal/marine ecosystems play an important role in national greenhouse gas budgets, with large regional differences in the distribution of sources and sinks. Understanding the current and projected future roles of these systems in North America, including the impacts of management and climate change, is required in order to inform sustainable management of carbon sinks in coastal/marine ecosystems.

- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

This project will provide important information at the North American scale to help understand and quantify the carbon cycle and provide policy-relevant analyses about possible strategies for mitigating climate change through coastal/marine ecosystem management, including the protection of coastal habitats as carbon sinks and the reduction of emissions from coastal degradation. The project will enhance the collaboration among North American scientists, coastal managers, and policy-makers involved in modeling terrestrial and aquatic systems in accordance with IPCC guidelines; coordinate land cover mapping using satellites; and support mapping and research (particularly in seagrass meadows) to fill key knowledge gaps on the extent and condition of blue carbon ecosystems, particularly seagrasses, and to also help us improve our understanding of soil carbon and carbon density in seagrass ecosystems.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

The project will produce the following outputs: new maps and data on the location and characteristics of seagrass blue carbon habitats in North America as well as new data on the carbon storage and sequestration of these newly mapped seagrass areas in all three countries; development (in writing) of the conservation methodology for a voluntary carbon market; and expanded guidelines, including a detailed analysis of policy opportunities in each country where blue carbon benefits can be leveraged for coastal habitat conservation, which will contribute to supporting coastal managers with best practices to protect, manage and restore blue carbon habitats. Progress will be measured through: 1) in the short term, the strengthening of a North American experts group linking blue carbon and land cover experts, the development of a cooperative work plan for this group, and a workshop held with partners to develop the planned outputs; 2) in the medium term, improved North American seagrass maps and carbon data in key areas identified as gaps in the Phase I mapping effort; 3) in the long term, the dissemination of geographically-specific guidelines, based on recent policy analysis, for coastal managers about best opportunities and practices to protect, manage and restore blue carbon habitats. Ultimately, the project will demonstrate success through the uptake of the improved knowledge base and original tools, including market-based and non-market-based mechanisms, by the blue carbon community and related experts, to inform blue carbon science and blue carbon habitat management, in the context of climate change mitigation and adaptation.

Performance measures include the number and quality of improved maps available to the North American Blue Carbon Community of Practice, as well as analyses of the opportunities for Canada, Mexico, and the US to incorporate carbon services into existing federal, international, and market policies, in order to leverage carbon services for habitat conservation and/or climate mitigation and adaptation.

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- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking the project, considering these points:**
    - **the value added of doing it under the CEC cooperative program,**
    - **any other public, private or social organizations that work on such activities, and**
    - **opportunities to cooperate and/or leverage resources with such organizations.**

This project builds on and complements previous and ongoing CEC work to address some of the key science needs for blue carbon, and apply this scientific understanding to improving management of these critical habitats for carbon sequestration. In addition, a common online mapping platform that contains up-to-date, integrated terrestrial and coastal carbon information for North America will be an important tool for researchers.

Because research on blue carbon is a fairly new topic, relatively little is known about the sequestration, storage, and emissions potential in North American coastal ecosystems. The White House Priority Agenda for Enhancing the Climate Resilience of America's Natural Resources highlights the role, in the North American community, of practice facilitated by the CEC as a means to improve understanding of carbon storage and cycling in ecosystems in order to assess, restore, and protect coastal habitats. By supporting research to fill knowledge gaps and the sharing of information among scientists in the three countries, the project will sustain efforts spearheaded during the CEC's 2013–2014 project North America's Blue Carbon: Assessing the Role of Coastal Habitats in the Continent's Carbon Budget to collaborate on this topic at the continental scale. A preliminary scoping study carried out under the CEC's 2011–2012 project Ecosystem Carbon Sources and Storage: Information to Quantify and Manage for Greenhouse Gas Emissions Reductions identified the need for harmonized data and maps, a community of continental experts, and more research into how to quantify blue carbon. While the CEC's 2013–2014 blue carbon project made strides in meeting those needs, this project will capitalize on the momentum that is gaining in all three countries to further the potential to fully integrate blue carbon into the North America carbon budget. The project will reduce duplication of efforts; harmonize approaches, to improve consistency in analyses and reporting; leverage previous work on forest carbon and land use change; and collaborate in the development and application of analytical tools and models that can be applied in all three countries. Work produced by this project will provide the North American blue carbon community enough information and data to identify research opportunities and partnerships for advancing the estimations of blue carbon contributions in North America.

- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

This project has been designed as the first phase of a five-year initiative, with work hopefully continuing through to the end of the current strategic plan. It is hoped that the CEC support of and partnership with strategic research initiatives within the three countries will increase the capacity of the partner institutions to continue work to fill key research gaps and to advance management decisions that lead to increased conservation and restoration of coastal blue carbon habitats. The publication of the research in peer-reviewed journals will also facilitate integration of blue carbon into relevant policies.

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- **Where applicable, identify with reasonable specificity:**
    - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**
    - **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**
    - **The beneficiaries of capacity building activities that the project may include**
    - **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

Building on the CEC's previous blue carbon, forest carbon, and land cover mapping work, this project will complement the 2015–2016 project, Integrated Modeling and Assessment of Climate Change Mitigation Options in the North American Forest Sector, and leverage previous and current investments to benefit the blue carbon science and management efforts in North America. In addition, the CEC has identified blue carbon as a key element in designing climate-resilient marine protected area networks, and the information generated and shared within the Blue Carbon Community of Practice can be used to inform the 2015–2016 project, Marine Protected Areas: Strengthening Management Effectiveness and Supporting Coastal Community Resilience.

The project will also work closely with ongoing blue carbon work by North American and international organizations and NGOs, to avoid duplication of effort and to evaluate, for their applicability in the North American context, and adapt emerging research and tools. By working with these partners, this project will ensure that the results of this work will have value for policy-makers and managers of blue carbon habitats.

These initiatives and organizations include the following:

- The US Interagency Blue Carbon work group, made up of federal agencies interested in national and international blue carbon efforts. This group has been meeting for three years, primarily as a mechanism for information-sharing, as well as for developing collaborations between agencies. Agencies regularly attending these meetings include the US Environmental Protection Agency (EPA), US Geological Survey (USGS), US Fish and Wildlife Service (USFWS), the US State Department, The US Agency for International Development (USAID), and National Oceanic and Atmospheric Administration (NOAA).
- Fisheries and Oceans Canada (DFO), which in 2011 created a competitive funding envelope to develop a more comprehensive, science-based understanding of the impacts of climate change. This fund is intended to further develop the science and technology knowledge base in three designated priority areas: Canada's North, Marine and Freshwater Infrastructure, and Marine and Freshwater Ecosystem Impacts.
- Parks Canada is working with Simon Fraser University to determine real fluxes in carbon and carbon storage in lakes in several western Canadian national parks.
- Mexico's National Commission for Protected Natural Areas (Conanp), in coordination with the National Forestry Commission (Conafor), the Mexican Fund for Nature Conservation (FMCN), the Center for Research and Advanced Studies in Merida (Cinvestav-Mérida), the US Forest Service (USFS) and the US (USAID), has undertaken a project that will allow the assessment of mangrove in relation to climate change mitigation. The project involves developing the methodology to determine the occurrence and density of carbon in mangrove of Mexican Protected Areas, in order to: provide a baseline of the mangrove condition; elaborate a set of

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recommendations for the conservation, restoration and assisted mitigation of local mangrove populations; and have a validated protocol for sampling, classification and localization of mangrove populations and for the estimation of carbon, according to the mangrove type. This project was piloted in the Sian Ka'an Biosphere Reserve in 2011, was replicated in La Encrucijada Biosphere Reserve in 2012, and was conducted in Marismas Nacionales Nayarit Biosphere Reserve in 2013. The results of Sian Ka'an show that the carbon stocks depend on the height of mangroves and that phosphorous levels in the soil limit carbon sequestration. The coastal wetlands of Sian Ka'an, covering more than 172,000 ha, may store up to 58.0 million metric tons of carbon.

- The United States Forest Service (USFS) and Mexico (Conafor, Conabio and Conanp) efforts to map, monitor, and estimate carbon stocks and model carbon dynamics in mangrove forests. These institutions are considering establishing permanent carbon monitoring sites in Protected Areas in Mexico. The high-resolution, global mangrove forest spatial dataset developed by Chandra Giri from the United States Geological Survey (USGS) and others could be used as the model for future mapping efforts involving salt marshes and seagrasses.
- Restore America's Estuaries (RAE), a US nonprofit organization whose mission is to preserve the nation's network of estuaries by protecting and restoring the lands and waters essential to the richness and diversity of coastal life. They are focused on restoring coastal and estuarine habitats, as a key strategy in adapting to climate change, as well as in mitigating its impacts. RAE is leading an initiative to bring tidal wetlands restoration, protection, creation and avoided loss into the carbon markets. They have an ongoing study in the Pacific Northwest investigating the potential of carbon markets to support watershed restoration and a proposal submitted for a project in the Gulf of Mexico.
- Conservation International (CI) is an international nonprofit organization that works to ensure a healthy and productive planet, through science, policy and field work. CI has a number of ongoing blue carbon efforts, including the international Blue Carbon Science Work Group, which meets about twice a year and recently released a manual of blue carbon methodologies internationally and a data archive for global blue carbon data.

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Project 6: Reducing Emissions from Goods Movement via Maritime Transportation in North America – Phase II	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$250,000 **Year 1: C$115,000** **Year 2: C$135,000**	

Strategic Priority/Subtheme

- Green Growth / Transportation
- Climate Change Mitigation and Adaptation / Short-lived Climate Pollutants

How will this project address the cross-cutting themes?

The project assists vulnerable groups by reducing emissions of harmful air pollutants from ships, which can travel far from their source and impact communities both on coasts and also far inland.

The project helps align environmental regulatory standards by promoting common policies to address air pollution from ships in North America.

Project Summary (including a clear statement of project goal)

Shipping traffic is predicted to grow significantly in coming decades due to the increase in global trade of goods. Without policies to address air emissions from ships, they can become a significant source of pollution to communities relative to land-side sources and can degrade air quality and public health. This project seeks to promote consistent North American policies to address shipping emissions. Mexico has recently announced its intention to ratify MARPOL Annex VI, the Ship Air Pollution Annex, and it has the goal of putting an ECA in place by 2017. Building on Mexico's efforts and outcomes from 2013–2014 CEC project work (Phase I) to show the air quality, public health, environmental, and ecosystem benefits of reducing maritime shipping emissions, this project (Phase II) seeks to increase stakeholder awareness of the outcomes of Phase I and to promote coordinated North American action to address air pollution from ships. Activities conducted by this project will facilitate the exchange of best practices and lessons learned on policy and technical approaches. One policy that has been very effective in the US and Canada is the establishment of an Emission Control Area (ECA). Therefore, the primary goal of this project is to facilitate the establishment and implementation of an Emission Control Area in Mexico, adjacent to the existing US-Canada ECA and thus establishing a "truly North American ECA." This will be accomplished by providing additional technical support and information to develop a strategy for establishing the policies and regulations needed to implement an ECA, showcasing best practices for reducing ship emissions, including the use of alternative fuels such as natural gas, and documenting the emissions reductions achieved. Phase II will facilitate stakeholder input and dialogue on the draft ECA proposal developed in Phase I, so that it can be submitted to the International Maritime Organization (IMO), and will provide the opportunity for input on a Mexican ECA implementation strategy.

Short-term Outcomes (at halfway point)

Stakeholder understanding of the needs and benefits of reducing ship emissions and the establishment of a Mexican ECA

Long-term Outcomes (by the end of the project)

A common understanding and support from relevant North American stakeholders regarding additional actions to reduce air pollution from ships, such as through a Mexican ECA.

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Mexico submits an ECA designation proposal to the IMO.
Mexico develops an ECA implementation strategy.
Relevant North American stakeholders understand the available best practices and technologies to reduce ship emissions.

Longer-term, Environmental Outcomes (post-project)
Initial policies and regulations to facilitate the implementation of an ECA in Mexico are established.
Mexico establishes and implements an ECA, essentially creating a "truly North American" ECA with beneficial impacts for the North American region.
Significant reductions of air pollutants from ships (80% reduction of NOx, over 90% reduction in SOx, and over 80% reduction in PM per ship) achieved through a Mexican ECA (these represent emissions reductions that can be achieved through ECA standards).

Performance Measures (quantified SMART measures)

Technical Analyses
Specific – 1. Finalize IMO ECA proposal to include stakeholder comments and submit to IMO;
Measurable – 1. Final IMO ECA proposal
Attainable/Achievable/Acceptable/Assignable – can it be agreed to by the Parties and who will do the work: yes, Mexico/CEC
Relevant/Realistic – can this be achieved, relevant to the NA work; yes, yes.
Time-specific/time-limited – when will the activities be conducted, completed: second year

Policy and Regulatory Development for Mexican ECA Implementation
Specific – 1. Policy and regulatory strategy developed; 2. Work group established that holds regular meetings; and 3. Development of policies/regulations to implement an ECA
Measurable – 1. Analysis of existing policies and regulations conducted; 2. Policy and regulatory strategy developed; 3. Work group established; and 4. Number of policies/regulations developed
Attainable/Achievable/Acceptable/Assignable – can it be agreed to by the Parties and who will do the work: yes, Canada and the US can share their existing experience; Mexico has demonstrated a political commitment to implementing an ECA.
Relevant/Realistic – can this be achieved, relevant to the NA work; yes, relevant to the NA work
Time-specific/time-limited – when will the activities be conducted, completed: second year.

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Stakeholder Engagement and Awareness Raising
Specific – 1. Stakeholders are supportive of a Mexican ECA.
Measurable – 1. Expressions of stakeholder support for the Mexican ECA received (e.g., letters of support, verbal statements, presentations, supportive awareness campaigns); 2. Outreach materials developed (e.g., web site, brochure, video); and 3. Workshops conducted.
Attainable/Achievable/Acceptable/Assignable – can it be agreed to by the Parties and who will do the work: yes, Mexico/CEC
Relevant/Realistic – can this be achieved, relevant to the NA work; yes, yes.
Time-specific/time-limited – when will the activities be conducted, completed: second year

Best Practices and Technology Information Exchange
Specific – 1. Facilitate information exchange; 2. Capture information collected on a web page or in a presentation.
Measurable – 1. Documented dialogue among stakeholders at workshops (e.g., agenda items addressing this topic); 2. Web page or presentation prepared
Attainable/Achievable/Acceptable/Assignable – can it be agreed to by the Parties and who will do the work: yes, Mexico/CEC
Relevant/Realistic – can this be achieved, relevant to the NA work; yes, yes.
Time-specific/time-limited – when will the activities be conducted, completed: second year

Tasks necessary to reach the environmental outcome:
1) Technical Support to finalize the IMO ECA Proposal
2) Stakeholder Engagement and Awareness Raising
3) Policy and Regulatory Development for ECA implementation
4) Best Practices and Technology information exchange

Task #1) Technical Support to finalize the IMO ECA Proposal

Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Conduct additional analyses to include stakeholder input to the IMO ECA	• Working paper detailing analysis results	To develop a robust IMO ECA proposal that is supported by key stakeholders, it is important to ensure that Mexico can be responsive to comments from stakeholders. This activity provides the technical support to conduct additional technical analyses to strengthen the	March 2016–March 2017	Year 1: $10,000 Year 2: $10,000

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proposal		proposal. Some examples of possible additional analyses include: - Study addressing technical and market barriers (fuel supply) - Research into the cost-effectiveness of landside versus maritime emissions controls. - Analysis of operational cost impacts on select key maritime shipping lines.		
1.2 Finalize the IMO ECA proposal	• Results of additional analyses needed to complete proposal, including modeling • Incorporation of technical analysis results into IMO ECA proposal • Final IMO ECA proposal	Additional analyses may be needed after Phase I to address IMO ECA proposal requirements. A final IMO ECA will result in substantial health and environmental benefits in Mexico and North America.	March 2016–June 2017	Year 1: $10,000 Year 2: $10,000
Task #2) Stakeholder Engagement and Awareness Raising				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Develop and disseminate outreach information	• Public outreach materials based on technical information produced for the IMO ECA proposal (e.g., fact sheet, web site, brochure or video) • Dissemination of public outreach material (e.g., at	The audience for this information would include the public, NGOs, port communities, port authorities, shipping industry stakeholders, and government policy makers.	March 2016–March 2017	Year 1: $5,000 Year 2: $5,000

	meetings, on the web)			
2.2 Facilitate stakeholder dialogue and input	• Training of key agencies, e.g., at least one study tour of key officials to the US or Canada to learn from these countries' experience in implementing policies and regulations to address ship emissions • Workshop of key North American stakeholders, including government agencies, industry and NGOs • Presentation of draft IMO ECA proposal • Workshop report, including comments made on the proposal	It is beneficial if the proposal to the IMO is supported by relevant stakeholders to ensure that both technical and policy concerns are addressed. This subtask supports a process to ensure that stakeholders are able to provide input and understand the benefits of a Mexican ECA. This subtask is distinct from the stakeholder outreach in Task 3 because it is more focused on awareness-raising with a broad group of stakeholders about the benefits of a Mexican ECA. Task 3 engages stakeholders for input into the ECA implementation strategy.	March 2016–March 2017	Year 1: $40,000 Year 2: $10,000
Task #3) Policy and Awareness Raising				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Develop an ECA implementation strategy	• Analysis of existing policies and regulations • Development of draft strategy • Final strategy,	Mexico would benefit from a strategy for implementing a policy and regulatory framework for MARPOL Annex VI and an ECA in order to effectively reduce ship emissions and their impacts on public health and the environment.	March 2016–June 2017	Year 1: $25,000 Year 2: $35,000

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	including timeline and lead contacts for each involved agency/ stakeholder			
3.2 Facilitate stakeholder dialogue	• Workshop of key North American stakeholders, including government agencies, industry and NGOs • Presentation of draft IMO ECA proposal • Workshop report, including comments made on the proposal	To develop a robust strategy, this subtask facilitates the engagement of key stakeholders for input into the ECA implementation strategy. The workshop will facilitate the exchange of lessons learned from implementing the North American ECA in order to inform Mexico's implementation strategy.	March 2016–March 2017	Year 1: $25,000 Year 2: $30,000
3.3 Strategy implementation	• Identification of agency leads and task team • Information for the development of draft policies or regulations	This subtask initiates Mexico's ECA implementation strategy through the development of a team and a draft policy or regulation.		Year 2: $25,000
Task #4) Best Practices and Technology Information Exchange				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
4.1 Technical information exchange	• Sharing of information on best practices and technologies for conventional pollutant emission control in an ECA for the shipping sector (e.g. lower sulfur fuels, use of	Sharing information on best practices and technologies to reduce ship emissions helps stakeholders to better understand the impact of ship emission-reduction efforts, efficiency gains, and linkages to climate impacts. This dialogue will also seek to identify opportunities for cleaner fuels afforded by related energy policies in North America, such as Mexico's energy reform. As maritime shipping is a global industry,	August 2016–March 2017	Year 2: $10,000

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	LNG technologies) • Presentation or web page capturing information collected	information from stakeholders outside North America may also be included, as appropriate, in order to learn from their experiences in addressing maritime emissions. The audience for this information would include NGOs, port communities, port authorities, shipping industry stakeholders, and government policy makers.		
			Totals	**Year 1: $115,000** **Year 2: $135,000**

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?

  This project supports several strategic goals and cross-cutting themes as outlined in the Draft Definitions of 2015-20 Cross-Cutting Themes of 16 Oct. 2014. The project will address the transportation focus under the green growth strategic goal by focusing efforts on cleaner maritime transportation. Transportation projects should "aim to improve human and environmental health by limiting emissions from (multimodal) mobile sources, which deplete fossil fuels and contribute to air pollution and climate change. The transportation sector is the largest consumer of fossil fuels in North America." The project also supports the strategic goal on climate change, which includes a focus on short-lived climate forcers in various sectors including "transport, in order to minimize impact on human health and ecosystems."

  The project also addresses various cross-cutting themes. It will assist vulnerable groups and indigenous populations by reducing emissions of harmful air pollutants from ships, which can travel far from their source and impact communities both on coasts but also far inland. The project also helps to align environmental regulatory standards by promoting common policies to address air pollution from ships in North America.

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- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

  By creating a Mexican ECA, which would in effect result in a "true North American ECA," the North American region would set a global precedent for clean maritime shipping in its waters, thereby protecting the lives of tens of thousands of citizens and preventing ecosystem degradation. Ship emissions travel far from their source and can travel regionally to affect air quality and ecosystems throughout North America, so all citizens of North America would benefit from a Mexican ECA. The maritime shipping and port industries would also benefit from a level playing field regionally.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

  - IMO ECA proposal submitted to the IMO: Progress toward this result will be measured by tracking the finalization of the proposal; this will include addressing any stakeholder comments and conducting additional analyses required to formulate a final IMO ECA Proposal.
  - Mexico develops a strategy to implement an ECA: This will be measured by tracking the strategy as it is being developed, by work groups established to develop and carry out the strategy, and by the number of policies/regulations that are developed as a result of the strategy.
  - Stakeholders are supportive of a Mexican ECA: Progress toward this result will be measured by tracking expressions of stakeholder support for the Mexican ECA (e.g., letters of support, verbal statements, presentations, supportive awareness campaigns), development of outreach materials (e.g., web site, brochure, video), and workshops.
  - Sharing of best practices and technology information: Progress toward this result will be measured by documenting dialogue among stakeholders at workshops (e.g., agenda items addressing this topic) and developing information sources (e.g., web page or presentation).

- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking this project, considering these points:**

  - **The value-added of doing it under the CEC cooperative program**
  - **Any other public, private or social organizations that work on such activities**
  - **Opportunities to cooperate and/or leverage resources with such organizations**

  Value added: All three Parties working to create a truly North American ECA; information exchange and lessons learned that are unique to North America (other ECA is in Europe, where experience is different); a truly NA ECA would help establish a coordinated

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approach to addressing shipping emissions and level the playing field for maritime shipping and port-based industries and other related industries.

There are no other organizations currently working directly to help countries establish ECAs. The UNEP ports program is in its infancy and is focused on port sustainability broadly, not ECAs. The International Council on Clean Transportation (ICCT) has started to compile best practices for reducing black carbon from ships; the Mexican ECA work would build on the ICCT effort to the extent possible.

This project will take every opportunity to cooperate with other organizations and leverage ongoing work. For example, UNEP has new data from Indonesia confirming that ships are the biggest source of pollution in a port in Indonesia. This and other relevant information and data will be shared with Mexico.

- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

  The project timeline is two years, starting in the summer of 2015 and ending in the summer of 2017, though work is not expected to begin before December 2015 due to the time required for procuring consulting services. CEC engagement is expected in the development of the request for proposals (by winter 2015) and will run through the end of the project.

  Before 2017, it is hoped that a Mexican ECA will be approved by the International Maritime Organization (IMO) and enter into force, thereby adding Mexico to the US and Canada's existing North American ECA and creating a "truly North American" ECA. Mexico will then be involved in implementation and enforcement of the ECA, ideally working in concert with the US and Canada, which are currently implementing and enforcing the North American ECA.

- **Where applicable, identify with reasonable specificity:**

  - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**

    This project builds on the maritime shipping project of Operational Plan 2013-2014, which was Phase I and focused on establishing the technical analyses needed for Mexico to submit a proposal to the IMO to establish a Mexican ECA. This project is Phase II and will build on the work of Phase I by ensuring that Mexico's proposal to the IMO is supported by stakeholders and is as robust as possible, making it more likely to be approved by the IMO. The project will also ensure that Mexico has a framework for implementing an ECA.

    This project also links with the proposed Operational Plan 2015-2016 project on ECA enforcement in that it would establish the ECA that would need to be enforced. It would also begin to put policies in place that would enable enforcement; there should thus be close coordination with the enforcement proposal so as to prevent duplication.

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This project also links with other projects related to trade and goods movement, thereby helping to improve the overall environmentally sound movement of goods in North America.

- **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**

  There are several target audiences, depending on the activity. Political decision makers, the public, industry, and non-governmental stakeholders will be targeted for communicating the public and environmental benefits of a Mexican ECA. They are likely to be very receptive to the significant public and environmental health benefits possible through an ECA. Industry may be resistant, depending on the sector, and the project will allow for stakeholder dialogue and consultation to help address any concerns.

  Public policy makers will be targeted for the development of policies and regulations to implement an ECA. The project will help provide governmental capacity to develop these regulations.

- **The beneficiaries of capacity building activities that the project may include**

  Government agencies in Mexico, the maritime industry, non-governmental organizations

- **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

  Relevant stakeholders include communities, NGOs, industry, and academia. They will be involved through stakeholder outreach workshops, where they will be invited to provide input and comments to Mexico's ECA implementation strategy as well as the draft Mexico ECA proposal and other relevant outputs of the project. Particularly vulnerable populations will benefit from a Mexican ECA, due to the reduction of harmful ship pollutants.

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Project 7: Enhancing North American Enforcement of IMO Maritime Fuel Sulfur Limits	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$250,000 **Year 1: C$125,000** **Year 2: C$125,000**	

Strategic Priority/Subtheme

- Green Growth / Transportation
- Climate Change / Short-Lived Climate Pollutants

How will this project address the cross-cutting themes?

The project assists efforts to improve human health, particularly in vulnerable groups, and the environment by ensuring that international shipping complies with the sulfur limits established by the International Maritime Organization (IMO) for Emission Control Areas (ECAs). The project will facilitate the implementation, coordination and, if appropriate, alignment of processes and policies utilized to assess compliance with the ECA sulfur limit in North America. The project will enhance the gathering, analysis and sharing of information pertinent to compliance monitoring and enforcement of the ECA sulfur limit.

Project Summary (including a clear statement of project goal)

The goal of this new CEC project is to enhance North American capacity to assess compliance with, and enforce as appropriate, the International Maritime Organization's (IMO) maritime fuel sulfur standards, particularly those applicable in Emission Control Areas (ECAs). Annex VI of the IMO's MARPOL Convention established a globally applicable limit on the sulfur content of marine fuel as well as a dramatically more stringent sulfur standard for designated ECAs. Parties to Annex VI may propose the designation of an ECA as a binding amendment to Annex VI when they demonstrate that SOx, PM and/or NOx emissions from international shipping adversely affect air quality, human health, and the environment in specified geographic areas. The US and Canada, having already established the North American ECA, currently are working through the CEC to help Mexico develop an ECA designation proposal for Mexican waters, which—once adopted by the IMO—would effectively yield a truly North American ECA. The CEC Parties now propose to collaboratively work on measures that will increase our confidence that international shipping is, and will be, complying with the ECA sulfur standard. Marine fuel currently accounts for roughly one-half of a typical ship's daily operating costs, and using low-sulfur fuel can increase a ship's daily fuel cost by thousands of dollars. This cost differential will increase when the IMO's sulfur limit for ECA-compliant fuel drops from 1.0 percent to 0.1 percent on 1 January 2015. Evidence from the two sulfur ECAs in Northern Europe indicates that some ship operators know of the limited enforcement regimes there and are intentionally violating the current sulfur standard in order to reduce fuel costs. Cheating on a large scale would compromise and decrease the air quality, health, and environmental benefits associated with the IMO's fuel sulfur standards and competitively harm those maritime carriers that do comply with the standards. Since maritime transport is a truly global industry, and since North America has extensive maritime trade flows, both internally and with the rest of the world, the CEC is well-placed to take steps that will enhance North American enforcement of the IMO sulfur standards.

Short-term Outcomes (at halfway point)

- Enhanced awareness of the need and ways to monitor compliance with and enforce the IMO's ECA and global sulfur standards
- Understanding of common elements of, and differences among, the relevant compliance and enforcement systems in the CEC

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countries
- Initial description of available compliance monitoring technologies and information security measures

Long-term Outcomes (by the end of the project)
- Greater public awareness of the conduct and efficacy of joint inspection campaigns or other sulfur standard compliance efforts
- Evaluation of available monitoring technologies and best practices, along with key questions/issues requiring further attention
- Proposals for coordinated North American information gathering, analysis, and exchange processes and tools to enhance compliance monitoring and enforcement
- Proposal for potential Mexican consideration on measures to establish and/or enhance its implementation and enforcement system
- Proposal(s) for possible MARPOL Annex VI amendments that would strengthen compliance assurance and enforcement

Longer-term, Environmental Outcomes (post-project)
- Coordinated compliance monitoring and enforcement campaigns to detect and deter cheating
- Significant reductions of maritime air pollution, both criteria pollutants and climate pollutants
- Commensurate improvements in North American air quality, human health, and ecosystems

Performance Measures (quantified SMART measures)
- **Conduct outreach and awareness raising**
  - Specific: Conduct a workshop on existing compliance/enforcement regimes and best practices, develop a white paper on desirable North American coordination measures and potentially useful MARPOL Annex VI amendments to enhance compliance efforts, develop a white paper on how Mexico might establish or enhance its domestic compliance and enforcement regime, and initiate a public awareness campaign on efforts by the CEC Parties.
  - Measurable: The workshop, workshop summary, and white papers are discrete outputs and activities that can be measured both through their completion and quantifiable changes in the understanding and practices of pertinent government officials in the CEC countries. The public awareness campaign is a discrete activity and output that can be measured in terms of greater public awareness of and support for robust compliance monitoring and enforcement of the IMO sulfur standard for ECAs.
  - Attainable/Achievable/Acceptable/Assignable: The subtasks are attainable and achievable, acceptable and assignable.
  - Relevant/Realistic: These are relevant to the process of improving and aligning ECA implementation and enforcement regimes within the three North American countries, and in identifying North American proposals for possible IMO policymaking. These are realistic because they build upon other outreach and awareness raising programs that influenced the development of the North American and other ECAs.
  - Time-specific/time-limited: The discrete subtasks can be conducted and completed by the end of the project's second year.
- **Promote more standardized gathering and exchange of information on compliance with the IMO ECA sulfur standard in North America**
  - Specific: Review the existing marine sulfur compliance and enforcement regimes in North America and identify core features of such programs; develop a draft standardized sulfur inspection compliance checklist and procedures, along with options for factoring compliance monitoring information on ships in transit into Port State Control inspections; and develop a draft framework for the trilateral exchange of compliance information.
  - Measurable: completion of all work outputs; formal consideration of findings and recommendations.

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- Attainable/Achievable/Acceptable/Assignable: Much of this work has been started, at least within the US and Canada, but no work has started on a North American scale. With support from the CEC, the CEC Parties should be able to develop a draft proposal for a standardized compliance inspection checklist, a process for integrating compliance monitoring information on ships transiting an ECA into a Port State Control inspection, and a framework for the trilateral exchange of sulfur compliance information.
- Relevant/Realistic: Port State Control officers must address many matters during inspections and will benefit from the time saving procedures and tools meant to assess compliance with Annex VI fuel sulfur standards. Standardized data integration and exchange procedures will maximize the effectiveness and resource-efficiency of compliance/enforcement efforts across North America.
- Time-specific/time-limited: The work products will be developed in both years and can be completed by the end of the second year. However, key decisions to formally establish a standardized regime in the CEC likely must wait until after the end of the project.

- **Assess and develop monitoring technologies to assist with compliance assurance and enforcement**
  - Specific: Literature reviews of best practices for real-time, in-use sulfur compliance monitoring and information security measures; workshop of government, maritime carriers and technology providers to review and evaluate available monitoring technologies; and white paper on key issues that will require further attention.
  - Measurable: These are discrete outputs and activities. The literature reviews and workshop discussions will result in quantifiable expressions of interest in or support for the different monitoring options.
  - Attainable/Achievable/Acceptable/Assignable: These technologies already exist and need only be proven suitable for use in a maritime transportation context.
  - Relevant/Realistic: This is relevant because compliance information gathered shore-side, i.e., while a ship is at berth, does not necessarily reflect a ship's compliance with the ECA sulfur standard while it operates far from shore (e.g., out to the limit of the 200 nautical mile North American ECA boundary). It is realistic because comparable monitoring systems are used widely in other settings, e.g., on stationary sources.
  - Time-specific/time-limited: The discrete subtasks can be conducted in limited blocks of time, and the work will be completed by the end of the project's second year.

Tasks necessary to reach the environmental outcome:

1) Conduct outreach and raise awareness.
2) Promote more standardized gathering and exchange of information on compliance with the IMO ECA sulfur standard in North America.
3) Identify and exchange information on best practices and technologies for monitoring compliance with the sulfur standard.

Task #1) Conduct outreach and raise awareness

Subtask	**Project Outputs**	**How does the subtask/output move the project towards the environmental outcome?**	**Timing**	**Budget (C$)** (activities)
1.1 Exchange information on best practices for facilitating	• Workshop on best practices (year 1)	The workshop will help CEC Parties, subnational government entities, and counterparts from	November 2015–May 2016 (for the	Year 1: $40,000 Year 2: $30,000

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compliance and enforcement of the IMO ECA sulfur standard	• Workshop summary for public release • Draft white paper on desirable coordination measures and potentially useful amendments to MARPOL Annex VI • Draft white paper with suggestions on how Mexico might establish or enhance its sulfur compliance assurance and enforcement regime	European nations with sulfur ECAs learn about and evaluate their respective compliance assurance and enforcement regimes. The workshop discussion will facilitate the development of the white papers, for submission to and consideration by the CEC Parties.	workshop) July 2016–June 2017 (for white papers)	
1.2 Public awareness campaign	• Translation of web content for use by the CEC Parties, e.g., on the results of joint sulfur compliance inspection campaigns •	Compliance assurance and enforcement efforts by the CEC Parties will be enhanced through greater public awareness of the efficacy of initial sulfur compliance results.	January 2016–June 2017	Year 1: $5,000 Year 2: $5,000
Task #2) Promote more standardized gathering and exchange of information on compliance with the IMO ECA sulfur standard in North America				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome?**	**Timing**	**Budget (C$)** (activities)
2.1 Review marine sulfur compliance assurance and enforcement regimes in the CEC countries	• Overviews of legal and regulatory authorities and programs • List of recommended core features for compliance assurance and enforcement program	An understanding of the common features and differences of the compliance assurance and enforcement regimes in the CEC nations is a prerequisite to the consideration of ways to standardize and enhance the gathering, exchange, and action upon compliance information.	November 2015–June 2016	Year 1: $30,000 Year 2: $0

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2.2 Review available sulfur compliance checklists and procedures used for Port State Control (PSC) or equivalent inspections	• Compilation and review of models • Draft of standardized inspection checklist and procedures • Draft paper outlining options for integrating compliance monitoring information from a ship that is underway inside the ECA into a PSC inspection when the ship makes a port call	This provides a standardized PSC inspection checklist that the Parties agree will provide meaningful, reliable, and transferable information on a ship's compliance during the ship's port calls. Information from the PSC inspection during a ship's port calls is necessary but not always sufficient for identifying possible sulfur standard violations while the ship is underway within the ECA.	November 2015–November 2016	Year 1: $15,000 Year 2: $15,000
2.3 Develop framework for the trilateral exchange of sulfur compliance information from PSC inspections and monitoring of ships underway in an ECA	• Draft framework and procedures for trilateral information exchange • Identification and assessment of potential legal or regulatory obstacles or impediments • Draft CEC proposal on the exchange of compliance information	A framework that rapidly and reliably exchanges sulfur compliance information and intelligence across the CEC Parties will help to ensure the integrity of the ECAs while maintaining a level playing field for maritime carriers. This subtask builds upon CEC's existing Enforcement Working Group (EWG) work on procedures for the trilateral exchange of enforcement-related information.	December 2016–June 2017	Year 1: $0 Year 2: $30,000

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Task #3) Identify and exchange information on best practices and technologies for monitoring compliance with sulfur standard				
Subtask	**Project Outputs**	**How does the subtask/output move the project towards the environmental outcome?**	**Timing**	**Budget (C$)** (activities)
3.1 Identify best practices for real-time, in-use sulfur compliance monitoring	• Literature review of available technologies and best practices • Literature review of standards for ensuring the reliability and security of sulfur monitoring information	CEC Parties require such monitoring to check the compliance of ships that are underway inside the ECA but still well off their coastlines. Without it, compliance and enforcement measures can only be taken against those ships that call at a port. The data gathered and transmitted by such monitoring systems must be secure from hacking or other forms of manipulation in order to provide reliable, actionable information to government enforcement personnel.	November 2015–June 2016	Year 1: $35,000 Year 2: $0
3.2 Evaluation of technologies and best practices	• Two-day workshop to present and review available options • Summary report of workshop, for public dissemination • White paper compiling and describing key questions and issues that require further attention	The workshop facilitates the exchange and evaluation of information on current efforts by self-selected maritime carriers, port authorities, and technology providers to develop and test various monitoring technologies and associated back-end systems, including data transmission by Automatic Identification System (AIS) or other systems.	July 2016–June 2017	Year 1: $0 Year 2: $45,000
			Totals	**Year 1: $125,000** **Year 2: $125,000**

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Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

  This project supports several strategic goals and cross-cutting themes set out in the Draft Definitions of 2015–2020 Cross-Cutting Themes of 16 October 2014. The project will address the transportation focus under the green growth strategic goal by promoting cleaner maritime transportation. Since the transportation sector is the largest consumer of fossil fuels in North America, transportation projects should "aim to improve human and environmental health by limiting emissions from (multimodal) mobile sources, which deplete fossil fuels and contribute to air pollution and climate change." By ensuring that international shipping complies with the sulfur limit while operating inside ECAs, the project also supports a level playing field in the maritime transport sector, minimizes the potential for distortion of trade flows, and eases the burden of North American communities and industries that must comply with air quality standards. The project also supports the strategic goal on climate change, which includes a focus on short-lived climate pollutants in various sectors, including "transport, in order to minimize impact on human health and ecosystems."

  The project also addresses several cross-cutting themes. It will assist vulnerable groups by reducing emissions of harmful air pollutants from ships, which can travel far from their source and impact communities both on coasts and also far inland. The project also helps to align environmental regulatory standards by promoting common policies to address air pollution from ships in North America.

- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

  The proposed objectives are North American in scope, and the results are relevant to protecting human health and the environment throughout North America. Creating a North American ECA represents a decision to utilize the provisions of a globally developed and applicable agreement (MARPOL Annex VI) to establish more stringent and regionally applicable maritime emissions standards in order to best protect human health and the environment in North America with minimal adverse impact on the maritime transportation sector and international trade patterns. Unless the CEC Parties effectively monitor compliance with—and enforce—the ECA sulfur standard, the higher cost of 0.1% sulfur marine fuel, required as of 1 January 2015, could result in significant cheating, particularly by ships that transit the ECA but do not call at North American ports. Such cheating compromises the benefits expected from the ECA and adversely affects competition within the maritime transport sector, which would have the perverse effect of particularly harming the

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very companies that voluntarily comply with the sulfur standard. Upon the project's successful completion, Council members would be able to announce to the press and general public that we are collaboratively working to enhance North American enforcement of the ECA(s) in our region to underscore our commitment to improving human health and the environment while continuing to grow our economies and promote international trade. In addition, the work to align North American processes and policies to monitor compliance with and enforce the ECA will establish a critical foundation for the Mexican government's own efforts to implement an upcoming Mexican ECA in the most cost-effective, efficient and timely fashion. This would result, in effect, in a truly North American ECA that would protect health and the environment and set a global precedent for efforts to reduce maritime air pollution in other parts of the world.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**
  - North American utilization and possible revision of the current Port State Control inspection compliance checklist and procedures, as well as the development of a draft North American framework for exchange and integration of inspection-based and other compliance information. Development of proposals for the possible establishment and/or enhancement of a Mexican implementation, compliance monitoring and enforcement regime for the ECA sulfur standard.
  - Identification and evaluation of compliance monitoring technologies for ships operating offshore, along with identification of best practices to assure the reliability and security of information from such monitoring systems.
  - Workshop on best practices, white paper on needed enhancements to ECA implementation and enforcement regimes, and public awareness campaigns will facilitate governmental and stakeholder efforts to characterize and ensure the meaningful compliance with and enforcement of the IMO's sulfur standards.
  - The combined effect of these measures will lead in turn to more competent CEC-wide monitoring and enforcement of the IMO's ECA sulfur standard, with commensurate and reliable reductions in maritime air pollution from ships operating in North American ECAs and the maintenance of a level playing field for maritime carriers.

- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking this project, considering these points:**
  - The value-added of doing it under the CEC cooperative program: The best way to implement, monitor and enforce the IMO ECA sulfur standard is through a continent-wide effort; smaller-scale and/or poorly coordinated efforts will be less effective and more costly in the end. The CEC Parties have significant maritime trade flows among themselves and with other countries around the world. Moreover, a significant portion of global shipping traffic transits North American waters without visiting a North American port. All of this maritime traffic is subject to the IMO's sulfur standards, particularly within North American ECAs. In addition, the proposed project builds on the ongoing CEC project to support the development of a Mexican ECA under IMO auspices, the CEC's longstanding effort to promote effective regional implementation and enforcement of critical environmental standards and agreements, and the work of the CEC's Enforcement Working Group (EWG) to facilitate the trilateral exchange of enforcement-related information.
  - Any other public, private or social organizations that work on such activities: No other organizations operating in North America are working to support the continent-wide enforcement of ECA standards and/or the establishment of a Mexican ECA. The California

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Air Resources Board (CARB) is working to implement and enforce its own sulfur standard, which requires the use of 0.1% sulfur in marine fuels used in all ships operating within 24 nautical miles of California's coastline. CARB has committed to 'sunset' its sulfur standard after the ECA's 0.1% sulfur standard takes effect and once CARB has determined that the implementation of the North American ECA will reliably generate the reductions in maritime air pollution needed to improve air quality in California. In addition, government entities and major maritime carriers based in Europe are beginning to work on ways to support compliance monitoring and enforcement of the sulfur standard. Although their initial focus may have been on the sulfur ECAs in the Baltic Sea and the North Sea and English Channel, they have expressed a clear desire to coordinate with North American partners in order to ensure robust implementation and enforcement of all ECAs.

- Opportunities to cooperate and/or leverage resources with such organizations: CARB has committed to support EPA and other project participants by sharing its experiences and tools in conducting sulfur inspections or otherwise monitoring compliance with the State of California's existing 0.1% sulfur requirement for ships within 24 nautical miles of the coast. European counterparts such as the Danish Maritime Authority and comparable government entities in other Northern European nations, as well as the European Commission, support the establishment, through the CEC, of a North American complement to their own nascent efforts to coordinate ECA enforcement. The Danish Maritime Authority has invited Canada and the US to participate in a meeting (tentatively scheduled for 25–26 February 2015) to identify possible opportunities for enhancing and coordinating European and North American compliance monitoring and enforcement of the ECA fuel sulfur standard. Finally, we already have clear expressions of interest from major maritime transportation industry leaders (e.g., Maersk), port authorities (e.g., Los Angeles, Long Beach, and Norfolk), academics and NGOs (e.g., ICCT) to participate in and support the CEC's work on enforcing maritime sulfur standards.

- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

  - The project timeline is two years, beginning in July 2015 and ending in June 2017. CEC engagement is expected to begin with the development and publication of the Request for Proposals (by winter 2015) and continue through the remainder of the project. It is hoped that the results of this CEC project will include the first concrete steps toward greater coordination and alignment of ECA compliance monitoring and enforcement mechanisms in North America. It is worth noting that a single two-year CEC project will not be enough to identify and promote the establishment of the range of potentially appropriate measures that could enhance and coordinate North American compliance monitoring and enforcement of the sulfur standard.
  - Upon the project's completion in 2017, it is hoped that the work will inform Mexico's decisions concerning the establishment and/or improvement of a Mexican regime for implementing and enforcing an ECA. This underscores the strong connection between this project proposal and the proposal for Phase II of the current CEC project to support the establishment of a Mexican ECA.
  - By the time this project ends, the CEC Parties will be actively coordinating, both among themselves and with European counterparts, in gathering, exchanging and analyzing information to undertake intelligence-led enforcement of the ECA sulfur standard.
  - Over the longer term, the information and products generated through this project could inform the IMO's consideration and decision in 2018 of when to lower the globally-applicable fuel sulfur limit to 0.5%. Although this decision will be based primarily on the ability of the global refining industry to supply adequate quantities of compliant fuel, it seems appropriate to factor sulfur

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standard compliance results into the decision-making process. As such, this CEC project—along with related efforts in Europe—could provide a vital and very timely contribution to the IMO's policymaking.

- **Where applicable, identify with reasonable specificity:**

  - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**: This project links closely with the ongoing CEC maritime shipping project, started in OP13-14, which is focused on conducting the technical analyses needed for Mexico to submit an ECA designation proposal to the IMO to establish a Mexican ECA. The experience gained through this project, as well as the existing designation of project leads in each country, will help to facilitate the enforcement project's work. Moreover, this enforcement project will identify best practices and lessons learned that should assist Mexico in rapidly designing and establishing its capacity to implement a Mexican ECA. Finally, the framework for gathering, analyzing, and sharing compliance information on a North American scale will lead to improved and better coordinated enforcement of the sulfur standard. Accordingly, this project hopes to build on some of the lessons learned and networks established by the CEC's Enforcement Working Group.
  - **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**: The primary target audience is the enforcement, compliance assurance, and maritime policy teams within the governments of the three Parties. The teams from the US and Canada are receptive to using the information and work products that will be generated through this project, and we anticipate that the Mexican government's entity responsible for implementing an eventual Mexican ECA will be as well. In addition, the California Air Resources Board is a target audience in that this project—and the resultant improvement in the enforcement of the North American ECA—will increase CARB's confidence that maritime emission reductions will continue in California's waters even after CARB sunsets its 24 nautical mile 0.1% sulfur standard for maritime shipping. Other target audiences include North American port authorities and air quality management districts in areas with significant maritime activity and air quality management challenges, in that the efficacy of their air quality management programs will be influenced by the success of this project. Moreover, port authorities that have established incentive schemes to promote greener shipping (e.g., Vancouver, Los Angeles, and Long Beach) may be able and willing to integrate ship-specific compliance information generated through this project into the scoring matrices they use to select the recipients of their financial incentives. While this clearly goes well beyond the measures set out in MARPOL Annex VI, it can amplify and facilitate the efforts of the CEC Parties to ensure compliance with and enforcement of the IMO sulfur standard.
  - **The beneficiaries of capacity building activities that the project may include**: primarily, the government entity in Mexico responsible for implementing and enforcing a future Mexican ECA. Canada and the US will benefit indirectly in that their own enforcement of the ECA standard will be strengthened by the existence of a well-trained, competent, and capable Mexican ECA implementation and enforcement regime. This reflects the considerable amount of cross-nation maritime transport activity within North America, as well as with the rest of the world.
  - **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**:
    - Communities, particularly those with air-quality management challenges and/or vulnerable populations with high exposure to maritime air pollution, in that robust enforcement of the sulfur limit will ease the air-quality management burden of these communities while ensuring reduced exposures and impacts on human health and the environment.

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- Academia: their expertise will be useful in developing robust, secure monitoring technologies and back-end platforms, among other things.
- NGOs: awareness raising and outreach.
- Industry: awareness raising, ship vetting metrics, platforms for proof-of-concept testing of key monitoring technologies, provision of intelligence on possible violations, and provision of information on the utility of current and proposed enforcement regimes in maintaining a level playing field in the maritime transportation sector.
- Port authorities: some port authorities may partner with project participants and key industry leaders to conduct tests of monitoring and tracking technologies; all interested port authorities could engage in awareness raising, in addition to linking information from the project's compliance assurance and enforcement findings to port-based green shipping incentive schemes.

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Project 8: Accelerating Adoption of ISO 50001 and Superior Energy Performance® (SEP) Program Certifications in North America	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$300,000 **Year 1: C$80,000** **Year 2: C$220,000**	
Strategic Priority/Subtheme: • Green Growth / Clean Energy	

How will this project address the cross-cutting themes?

- *Enhancing information sharing, transparency, capacity building and communication:*
  The goal of this project is to position ISO 50001 and the Superior Energy Performance program (SEP) as key mechanisms for reducing greenhouse gas emissions and improving energy efficiency in the industrial and commercial sectors in North America. ISO 50001 and SEP adoption represents a strategic investment in sustainability and profitability. The industrial sector alone accounts for more than one-third of the world's energy use and, according to the International Energy Agency (IEA), the potential to improve energy efficiency in that sector is large.

  ISO 50001 provides a proven and internationally recognized system for planning, managing, measuring, and continually improving energy performance in any organization that uses energy. ISO 50001 is proving to be an effective strategy for governments and industries to cost-effectively reduce energy use. The SEP provides guidance, tools, and protocols to drive deeper and more sustained energy savings from ISO 50001. To become SEP certified, facilities must meet the ISO 50001 standard and demonstrate improved energy performance; i.e., a SEP-certified facility has both the ISO 50001 energy management system (EnMS) and energy performance improvement verified by a third-party auditor. To date, ISO 50001 and SEP-certified facilities in the United States have averaged a 12-percent improvement in energy performance over three years. Having a common North American approach that is built upon globally relevant standards will support accelerated uptake of energy efficiency measures in North American industrial and commercial facilities.

  Currently, across the region, there is weak workforce capacity to enable widespread adoption of ISO 50001 and SEP. A key emphasis of this project is to build this workforce capacity by establishing common personnel-certification schemes, training future instructors, and teaching end-users at pilot-project facilities in order to demonstrate the value of ISO 50001 and SEP in key sectors across North America. A trilateral effort focused on expanding the availability of highly skilled energy management professionals across the region will not only help accelerate the development of a qualified energy efficiency workforce but help multinational companies more easily identify qualified employees and consultants, resulting in increased confidence and assurance of ISO 50001 and SEP outcomes. In addition, because the SEP program provides third-party verification of facility energy performance improvement, it thus helps to verify greenhouse gas emission reductions. Using a standardized approach to verifying energy performance improvements can help governments and organizations track progress towards energy, sustainability, and climate goals.

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Engaging a range of key stakeholders—national governments, standards bodies, private sector representatives, accreditation and certification bodies, and trained and certified professionals—is vital to creating a robust and high-quality infrastructure for implementing ISO 50001 and SEP. This program will help establish a healthy dialogue among these stakeholders at the national and regional level to enable sharing of best practices in developing ISO 50001 and SEP infrastructure and building harmonized programs.

Project Summary (including a clear statement of project goal)

This project is intended to accelerate energy and cost savings and greenhouse gas emission reductions in North America's industrial and commercial sectors by helping to grow the workforce needed to implement ISO 50001 and the Superior Energy Performance® program in Canada, Mexico, and the United States; demonstrating the economic and environmental benefits of ISO 50001 and SEP implementation; and fostering a North American approach to ISO 50001 and SEP adoption.

The project's first task will be to establish common requirements for personnel-certification in the region and train energy management professionals to become Certified Practitioners in Energy Management Systems (CP EnMS). These newly certified individuals will be qualified to receive additional coaching and hands-on training experience by serving as "apprentice instructors" during training sessions for the staff of pilot facilities (see second-phase pilot program below). These individuals can eventually go on to become instructors for ISO 50001 and SEP.

The second task will consist of a pilot program. Canada, Mexico, and the United States will identify about five companies/organizations per sector to participate in an ISO 50001 and/or SEP pilot program. Priority will be given to companies/organizations with facilities in all three countries, with special consideration given to those within the North American truck and bus supply chain. In exchange for participating in the North American pilot program, employees in the pilot facilities ("end users") will receive training on ISO 50001 and/or SEP implementation. Each sector-specific training series will take place in one of the three countries and will consist of approximately three multi-day training sessions over the course of 12 months. The training series will be led by experienced energy consultants. Local professionals who have recently received the necessary qualifications to serve as instructors and have practical experience will shadow the lead instructors and be mentored to become future instructors.

The third task will focus on sharing lessons learned during the pilot program and facilitating dialogue among relevant stakeholders in Canada, Mexico, and the United States, with the goal of creating a more harmonized approach to ISO 50001 and SEP adoption across North America, in part through laying the groundwork for establishing peer-learning networks.

Short-term Outcomes (at halfway point), year 1 of project

Four professionals trained as Certified Practitioner in Energy Management Systems (CP EnMS)
Three professionals qualified to train end users on ISO 50001and/or SEP
Fifteen pilot programs established; three cohorts of five facilities; one cohort-training series in each country: Canada, Mexico and the US

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Long-term Outcomes (by the end of the project), year 2 of project
Forty-five trained end users of ISO 50001 and/or SEP (three trainees at each of the 15 pilot facilities)
Three case studies of ISO 50001 and/or SEP implementation at pilot facilities (one per country)
Nine pilot facilities and buildings ISO 50001 and/or SEP certified

Longer-term, Environmental Outcome (post-project)
Third-party verified energy savings
Energy-related greenhouse gas emission reductions verified by third-party auditors

Performance Measures (quantified SMART measures)
Energy performance improvement measured and verified by SEP verification bodies at five North American facilities and buildings by end of 2017, yielding a source energy savings of 10 percent.

Tasks necessary to reach the environmental outcome:

1) Establish common personnel certification schemes and conduct "train-the-trainer" activities to increase the number of instructors qualified to train future ISO 50001 and SEP practitioners.

2) Implement pilot projects in priority sectors across North America to demonstrate value of ISO 50001 and SEP.

3) Convene key stakeholders to exchange best practices, foster harmonization, and lay the groundwork for peer networking opportunities.

Task #1) Conduct "train-the-trainer" activities to increase the number of instructors qualified to train future ISO 50001and SEP practitioners

Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Energy management professional training: Consultants will provide training to energy management professionals with high potential to go on to become local trainers of ISO 50001 and SEP. The focus will be on building up local expertise in Canada and Mexico and to fill gaps in the US as needed.	• Certification of at least 4 CP EnMSs	• Lack of Certified Practitioner in Energy Management Systems (CP EnMS) professionals is a barrier to greater deployment of ISO 50001 and SEP. At least three CP EnMSs will be needed to carry out pilot projects for this project, in addition to the lead trainers.	• Year 1: At least one CP EnMS training session	Year 1: $30,000 Year 2: $0

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Task #2) Implement pilot projects in priority sectors across North America to demonstrate value of ISO 50001 and SEP				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Train-the-implementer at pilot facility: There will be three parallel training series on ISO 50001 and/or SEP implementation. Each training series will focus on one sector. One training series will be held in each country. Each training series will consist of approximately three multi-day training sessions over the course of 12 months. Sessions will be open to companies in Canada, Mexico, and the US.	• End-user training for 15 facilities (about 5 per sector) • ISO 50001 or SEP Certification for 9 facilities (about 3 per sector)	• Encourages early adoption of ISO 50001 and SEP in priority sectors.	• Year 1: First training session of each sector specific training series (3 sessions in total) • Year 2: Second and third (final) sessions of each sector-specific series (6 sessions in total)	Year 1: $40,000 Year 2: $80,000
2.2 Apprentice instructor: Local CP EnMS professionals will shadow trainers and serve as assistant trainers. It is likely that these trainers-in-training will have participated in the train-the-trainer activities in Task 1 of this project, given the currently low number of qualified professionals.	• At least 3 CP EnMS professionals serving as assistant trainers and receiving coaching from lead trainers	• Builds local capacity for training more energy management professionals in ISO 50001 and SEP.	•	Year 1: $10,000 Year 2: $25,000
2.3 Case studies: Case studies will be	• At least 3 case studies (1 case study per sector)	• Conveys the value of ISO 50001 and SEP to early adopters, with the goal of	• Year 2: Case study development	Year 1: $0 Year 2: $40,000

developed for at least one pilot project per country/sector.		spurring greater adoption across North America.		
Task #3) Convene key stakeholders to exchange best practices, foster harmonization, and lay the groundwork for peer networking opportunities				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Convene stakeholders such as national governments, standards bodies, private sector representatives, accreditation and certification bodies, trained and certified energy management professionals, to enable the sharing of best practices in creating a robust ISO 50001 and SEP infrastructure; create harmonized programs to lay groundwork for peer learning networks.	• One workshop and additional webinars and conference calls as needed	• A range of key stakeholders must be engaged in order to create a robust and high-quality infrastructure for implementing ISO 50001 and SEP. This program will help establish a healthy dialogue.	• Year 2: One workshop	Year 2: $75,000

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

  Engaging a range of key stakeholders—national governments, standards bodies, private sector representatives, accreditation and certification bodies, and trained and certified professionals—is vital to creating a robust and high-quality infrastructure for implementing ISO 50001 and SEP. ISO 50001 provides a proven and internationally recognized system for planning, managing, measuring, and continually improving energy performance in any organization that uses energy. ISO 50001 is proving to be an effective strategy for governments and industries to cost-effectively reduce energy use. SEP provides guidance, tools, and protocols to drive deeper and more sustained energy savings from ISO 50001.

  This program will help establish a healthy dialogue among stakeholders at the national and regional level to enable the sharing of best practices in developing a strong ISO 50001 and SEP infrastructure and building harmonized programs.

  The United States, Canadian, and Mexican governments have all supported the development of resources such as case studies, guide books, and software tools to support industry implementation of ISO 50001. A key component of this project is to facilitate increased sharing of these resources. Another core project component is to establish common personnel-certification schemes and have ISO 50001 and SEP experts conduct training sessions for professionals from Canada, Mexico and the US on how to perform audits that conform to the ISO 50001 standard—internationally recognized as the best practice for implementing a holistic energy management system. Following the training sessions, participants will take a exams to earn relevant certifications. Finally, this project will support information sharing by working with private sector companies to develop case studies on pilot projects as a way to share lessons learned and demonstrate the value of ISO 50001 and SEP implementation.

  ISO 50001 and SEP adoption in the industrial sector represents a strategic investment in sustainability and profitability. The industrial sector accounts for more than one-third of the world's energy use, and according to the IEA, the potential to improve energy efficiency in the industrial sector is large. Businesses can use ISO 50001 and SEP to achieve and sustain large energy savings, optimize processes, boost competitiveness, and reduce risk. This project will aim to establish ISO 50001 and SEP as a mainstream sustainable business practice in North America that can demonstrate cost-effective energy efficiency improvements of 10 to 30 percent in varied industrial and commercial installations.

  Canada, Mexico and the United States are in a position to facilitate wider adoption of ISO 50001 and SEP in their respective countries by developing a harmonized North American approach to energy management systems that includes coordinated training, workforce professional credentialing, and pilot demonstrations. Regional harmonization will send a strong signal to North American manufacturing sectors, supply chains, and the commercial sector about the importance of robust and high-quality implementation of ISO 50001 to help reduce greenhouse gas emissions and increase competitiveness across the supply chain and in the overall economy.

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- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

  The proposed objective is North American in scope. The proposed objective is to accelerate energy and cost savings in North America's industrial and commercial sectors by facilitating dialogue among relevant stakeholders in all three countries, conducting pilot projects in industries of strategic importance to all three countries, and holding "train-the-trainer" activities to help build a qualified energy-efficiency workforce in all three countries. Some of the companies participating in the pilot program will have operations in Canada, Mexico, and the United States. A harmonized North American approach to ISO 50001 and SEP helps ensure that ISO 50001 certification in the US means the same thing as ISO 50001 certification in Canada and Mexico (and vice versa).

  The measureable results will come from having multiple corporations achieving ISO 50001 and SEP certification across North America whose energy savings and greenhouse gas emissions will be verified by third parties. The project will also build capacity and begin to create the required infrastructure necessary to scale implementation of ISO 50001 and SEP across various economic sectors.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

Outcomes	Measures	Target	Indicator
Increased number of Certified Energy Management Practitioners	Number of professionals trained as Certified Practitioner in Energy Management Systems (CP EnMS)	4 professionals trained (Y1)	Increased number of trained professionals
Increased number of qualified professionals to train end users on ISO 50001 and SEP	People qualified to train end users on ISO 50001 and/or SEP	3 people qualified (Y1) 45 people qualified (Y2)	Increased number of trained professionals
Establishment of ISO 50001 and/or SEP pilot programs in Mexico, Canada and the US	Number of pilot projects established	15 pilots established (Y1)	Increased number of pilot projects
Increased ISO 50001 and/or SEP-certified pilot projects	Number of certified pilot projects	9 pilot facilities and buildings ISO 50001 and/or SEP certified (Y2)	Increase in certified pilot projects
Increased third-party verified energy savings	Energy performance improvements	Average 10 percent source energy savings (or 100,000	Increased energy savings

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	measured and verified by SEP verification bodies	MM Btu source energy per year) at 5 North American facilities and buildings by end of 2017	
Increased energy-related greenhouse gas emission reductions	Energy-related greenhouse gas emission reductions extrapolated from SEP measurement and verification results.	Average ~5500 metric tons of carbon dioxide equivalent reductions for 5 North American facilities and buildings by end of 2017[18]	Increased greenhouse gas emission reductions

- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking the project, considering these points:**
  - The value-added of doing it under the CEC cooperative program
    - CEC support would be tremendously helpful in ensuring that program staffs have the resources needed to support collaborative work and to encourage the participation of key national stakeholders such as accreditation and standards bodies and the private sector.

  - Any other public, private or social organizations that work on such activities
    - This project would be conducted in close coordination with the Global Superior Energy Performance (GSEP) initiative. GSEP was launched in 2010 by the Clean Energy Ministerial (CEM) and International Partnership for Energy Efficiency Cooperation (IPEEC). Through GSEP's Energy Management Working Group (EMWG), government officials worldwide share best practices and leverage their collective knowledge and experience to create high-impact national programs that accelerate the use of energy management systems in industry and commercial buildings. Canada, Mexico, and the United States are key partners in GSEP work to promote a globally harmonized certification scheme for ISO 50001 Auditors (one of GSEP's marquis activities).
    - GSEP works closely with a number of donor and international organizations that promote energy efficiency worldwide, including the World Bank and UNIDO. These and other organizations have active programs to promote uptake of energy management systems in a number of countries, and GSEP helps support their work through technical input and sharing of best practices, resources, tools, guidance, and training materials.

    - This project will build off of a commitment to trilateral collaboration on ISO 50001 and SEP that is expected to be announced following the North American Energy Ministerial held 15 December 2014 in Washington, D.C.

[18] Based on rough estimates of verified energy savings per facility of 100,000 MM Btu source energy per year; GHG equivalency calculated using EPA use Gas Equivalencies Calculator: http://www.epa.gov/cleanenergy/energy-resources/calculator.html.

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        - Major multinational corporations in the manufacturing and commercial sectors (3M, Cummins, General Dynamics, Nissan, Schneider Electric, Marriott Hotels, Hilton Hotels, and others) are looking to implement and promote ISO 50001 throughout their North American operations and supply chains. A harmonized approach to promoting the ISO 50001 standard among countries will help facilitate private sector adoption.

    - Opportunities to cooperate and/or leverage resources with such organizations
        - Private sector companies have expressed interest in expanding their ISO 50001 and SEP activities across their North American facilities. The CEC project would help to demonstrate government leadership in motivating early adopting companies to accelerate their energy management activities. Existing GSEP work on the ISO 50001 lead auditor harmonization, as well as case study development, will assist and leverage with the CEC project.
        - GSEP and Mexico have already been in dialogue with several donor and international organizations working in Mexico about coordinating efforts through this proposed CEC project. The World Bank and UNIDO are interested in supporting this project in a number of ways; for instance, these organizations can provide funds to support the development of resources for sector-specific pilot projects and deeper on-the-ground technical assistance. Further dialogue to clearly define collaboration parameters will be conducted.

- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for the CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

    - Work will continue after CEC involvement through the established peer-learning network. Peer-learning networks have been shown to be effective in facilitating implementation through sharing of best practices and positive peer pressure. Peer networks can be established among North American companies by sector, supply chain, size, etc.
    - Train-the-trainer activities are also intended to have a long-lasting impact and lead to a greater number of certifications.

- **Where applicable, identify with reasonable specificity:**
    - Linkages with other relevant CEC projects such as the North American truck and bus supply chain project, past or present, in order to create synergies, capitalize on experience, or avoid duplication
        - Companies/facilities that are part of the North American truck and bus supply chain will be selected as priorities for pilot facilities as a part of this project.
    - The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project
        - Accreditation, certification, and standards bodies (American National Standards Institute, ANSI-ASQ National Accreditation Board, *Entidad Mexicana de Acreditación*, Standards Council of Canada)
        - Private sector corporations with facilities in Canada, Mexico and the US
        - Public sector municipalities and cities with water and wastewater facilities
        - Energy management system professionals with the potential to become qualified instructors

- The beneficiaries of capacity building activities that the project may include
  - Energy managers
  - Sustainability managers: corporate and public sector
  - Compliance managers
  - ISO management system experts
  - Utility energy-efficiency program managers
  - Management representatives
  - Aspiring third-party ISO 50001auditors
  - Operations staff in pilot facilities

- The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome
  - Accreditation, certification, and standards bodies (American National Standards Institute, ANSI-ASQ National Accreditation Board, *Entidad Mexicana de Acreditación*, Standards Council of Canada)
  - Private sector corporations with facilities in Canada, Mexico and the US
  - Municipal waste water facilities
  - World Bank
  - United Nations Industrial Development Organization
  - Institute for Industrial Productivity
  - Manufacturing trade associations

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Project 9: Strengthening conservation and sustainable production of selected CITES Appendix II species in North America	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$300,000 **Year 1: C$65,000** **Year 2: C$235,000**	

Strategic Priorities / Subthemes

- Green Growth / Sustainable Production and Consumption
- Sustainable Communities and Ecosystems / Priority Species and Ecosystems; Sustainable Communities
- Climate Change Mitigation and Adaptation

How will this project address the cross-cutting themes?

- *Learning from and assisting vulnerable groups and indigenous communities*: By taking into account scientific and traditional ecological knowledge (TEK), where applicable, in line with Resolution Conf. 16.6 on CITES and Livelihoods and Resolution Conf. 16.7 on Non-detriment Findings, support CITES implementation by involving indigenous and local communities in legal, traceable and profitable activities associated with the sustainable use of selected species from Appendix II of the Convention.

- *Enhancing the alignment of environmental regulatory standards, enforcement and compliance*: Long-term implementation of effective actions to strengthen and improve collaboration among CITES authorities throughout the region.

- *Enhancing information sharing, transparency, capacity building and communication*: By improving the exchange of information on priority species of regional interest and promoting legal, sustainable and traceable value-added and production chains, and enhancing the capacities of relevant stakeholders.

Project Summary (including a clear statement of project goal)

Portray trade of selected regional species that are listed in Appendix II to promote their legal, sustainable and traceable trade, through:

- **Phase 1 (Task 1 and Task 2):** Identification and prioritization of highly traded Appendix II species; followed by a comprehensive trade analysis aimed at identifying implementation challenges and opportunities for improvement (bearing in mind TEK-based elements, when applicable);
- **Phase 2 (Task 3):** Establishment and launch of action plans to strengthen and improve regional collaboration and information exchange of selected species listed in Appendix II, from their identification issues; through source and purpose codes; to non-detriment findings and their link with conservation, sustainable use, and development opportunities for indigenous and local communities (including TEK elements, when appropriate).

Main activities:

- Develop a prioritized list of Appendix II species of regional interest (Phase 1).
- Conduct a comprehensive trade analysis of Appendix II priority species (Phase 1).

- Propose measures (i.e., action plans) to improve the overall implementation of CITES provisions for Appendix II priority species (Phase 2).
- Organize a stakeholders' workshop—including representatives from indigenous and local communities—to discuss action plans (Phase 2).
- Launch action plans (Phase 2).

Deliverables:

- Report (Phase 1) that includes:
  - Priority list of CITES Appendix II species of regional interest
  - Comprehensive trade analysis of value and production chains of these priority species
  - Recommendations to improve the Appendix II priority species sustainable, legal and traceable trade

- Action plans (Phase 2) for priority species of regional interest (based on recommendations from the above report and stakeholders' workshop).
- Progress report on the implementation of action plans (approximately 10 action plans launched by the end of the project).

Short-term Outcomes (at halfway point)

Phase 1 (Task 1 and Task 2):

- Prioritized list of species of common regional interest validated by regional CITES authorities; and
- Report of the comprehensive analysis of the value and production chains of the agreed-upon species of regional interest. The report will include recommendations to improve the sustainable production and consumption of the concerned species, through legal and traceable trade.

Phase 2 (Task 3):

- Establishment of an action plan for each of the species agreed to under Phase 1, with specific goals, activities and progress indicators (among others to be defined):
- Stakeholders' workshop to gather feedback on proposed actions plans; and
- Launch of action plans at the regional level, which might cover, *inter alia*: generation of scientific information and technology exchange, cooperation between *ex situ* and *in situ* conservation and production, training and capacity building, market incentives, communication and awareness campaigns, strengthening of management schemes.

Long-term Outcomes (by the end of the project)

Phase 2 (Task 3):

- Six-month assessment of the launch of action plans at the regional level (considering an adaptive management approach, as

needed)

Longer-term, Environmental Outcome (post-project)

Favorable and constant trends in the conservation status of all species of regional interest agreed to under Phase 1 and their habitats. This is expected to result from the long-term implementation (and further improvement) of the action plans produced in Phase 2.

Performance Measures (quantified SMART measures)

The project addresses the long-term improvement of: the conservation status of species of regional interest; their habitats; and the fair and equitable sharing of benefits of their value and production chains among the key stakeholders (in particular, indigenous and local communities).

Considering the relatively short timeframe of the project (two years), we propose the following approach to assess its performance in terms of the percentage of:

1) Fulfilled project outputs
2) Deliverance of outputs in accordance with the task program (below)
3) Budget expenditure (balance) according to the expected exercise of resources
4) Production and value chains on priority species which have successfully incorporated the following elements (always in compliance with the agreed-upon action plans):
   a. Sustainable use principles and approaches (e.g., as in Resolution Conf. 16.7);
   b. Compliance with regulations (or legality);
   c. Traceability schemes; and
   d. Engagement of stakeholders such as local communities including indigenous communities, and industry

The project will be led and implemented by focal points of the regional CITES authorities (management, scientific, and enforcement), and the above indicators will be measured according to the task program below.

Tasks necessary to reach the environmental outcome:

1) From Appendix II, identify and prioritize a list of species of common regional interest to the North American countries;
2) Perform a comprehensive analysis of the value- and production-chains of the agreed-upon species; and
3) Establish and launch actions to strengthen and improve information-exchange and collaboration among the three countries on CITES implementation issues, to further enhance conservation and sustainable use of the species and their habitats, while generating benefits to all stakeholders in the value-chain

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Task #1) From Appendix II, identify and prioritize a list of species of common regional interest to the North American countries

Prior to this task, activities and guidance will be defined to produce a trade analysis to identify and prioritize the list of species of common regional interest from Appendix II. This work will result in Terms of reference to contract a consultant.

Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Develop a list of priority Appendix II species of common regional interest (consulting assistance required)	Report on proposed priority species' list for Phase 2	Will select the priority species for the list, together with the rationale behind their selection	1 month, Jun 2015	Year 1: $10,000
1.2 Seek validation of the priority species' list by regional CITES authorities (and in this process, take into account the feedback provided by other relevant stakeholders, including indigenous and local communities and producers) (meeting)	Final list of priority species	Will ensure regional consensus on the species' list and its prioritization	2-day meeting, Jul 2015	Year 1: $10,000
			Subtotal Task 1	**$20,000**

Task #2) Perform a comprehensive analysis of the value- and production-chains of the agreed-upon species of regional interest

Prior to this task, guidelines for a consultant to perform a comprehensive analysis of priority species will be developed. These will result in terms of reference and will take into consideration:
- TEK and Resolution Conf. 16.6 on CITES and Livelihoods;
- Resolution Conf. 16.7 on Non-detriment Findings;
- characterization of production- and value-chains;
- sustainable-use principles and approaches;
- existing, applicable regulations and requirements of the North American countries;
- traceability schemes;
- engagement of stakeholders;
- identification of areas of opportunity;
- effective actions; and
- relevant stakeholders.

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Subtask	Project outputs	How does the subtask/output move the project towards the environmental outcome	Timing	Budget (C$) (activities)
2.1 Comprehensive analysis of priority species (consulting assistance required)	Report on the comprehensive analysis of priority species	Will compile detailed data on the species, characteristics of their value and production chains, in addition to recommendations of "next steps" for the implementation of Phase 2	4 months, Jul–Oct 2015	Year 1: $30,000
2.2 Validation of comprehensive analysis report (meeting)	Final result of Phase 1	Regional consensus on the comprehensive analysis, which will serve as the basis for the development of action plans in Phase 2	2-day meeting, Nov 2015	Year 1: $10,000
2.3 Publication of Phase 1 results	Digital and/or printed publication of Phase 1 results	Will provide baseline information and starting points for a collaborative framework between the three countries for conservation and sustainable use of agreed-upon species of regional interest	3 months, Nov 2015–Jan 2016	Year 1: $5,000 Year 2: $5,000
			Subtotal Task 2	**$50,000**

Task #3) Establish and launch actions to strengthen and improve information-exchange and collaboration among the three countries on CITES implementation issues, in the service of furthering the conservation and sustainable use of the agreed-upon species of regional interest and their habitats, while generating benefits to all stakeholders in the value and production chains.

Prior to this task, basic elements (index of action plans) and approach to action plans for the agreed-upon species will be defined. These will result in terms of reference and will provide detailed (and regionally agreed-upon) guidance for development of the action plans.

Subtask	Project outputs	How does the subtask/output move the project towards the environmental outcome	Timing	Budget (C$) (activities)
3.1 Transform areas of opportunity, proposed actions, and relevant stakeholders identified in Phase 1 into action plans for the agreed-upon species of regional interest, considering Traditional Ecological	Proposed action plans for priority species	Will compile the specific actions, deadlines, stakeholders, coordination and information exchange schemes, and expected results with indicators for each priority species (or group of species)	5 months, Feb–Jun 2016	Year 2: $40,000

Knowledge and Resolution Conf. 16.6 on CITES and Livelihoods and Resolution Conf. 16.7 on Non-detriment Findings (consulting assistance required)				
3.2 Feedback from relevant stakeholders on action plans (stakeholder workshop)	Action plans agreed upon with relevant stakeholders	Incorporation of stakeholders into action plan feedback sessions	2-day workshop	Year 2: $30,000
3.3 Validation of action plans (meeting)	Finalize action plans for priority species	Agreement between the three countries on the action plans	2-day meeting, Jul 2016	Year 2: $10,000
3.4 Launch and implementation of action plans	Progress report	Assess implementation of action plans through management indicators on the selected species of regional interest, as well as through communication and collaboration among CITES authorities for the region	6 months, Jul–Dec 2016	Year 2: $150,000
			Subtotal Task 3	**$230,000**
			TOTAL	**$300,000**

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

Given its scope, the project will contribute to the achievement of strategic objectives 1, 2 and 4, on: increased resilience of ecosystems; improved environmental health of vulnerable communities; and strengthening regional environmental and wildlife law enforcement.

Adequate management of species of common regional interest listed in Appendix II must ensure their legal, sustainable and traceable trade; which in turn requires non-detrimental extraction rates that go hand-in-hand with the conservation of their wild populations and habitats, and, in consequence, with improvement in the health of ecosystems and the services they provide. To achieve this, involvement and capacity building of key stakeholders and, in particular, indigenous and local communities in the value and production chains are crucial and shall be according to benefit-sharing schemes. These actions and activities will require a finely coordinated collaboration between management and scientific and enforcement authorities throughout the region.

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- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

The project (its objectives and outcomes) are 100% regionally oriented: a) The target species for this project will be species of common regional interest and priority, selected from the list in CITES Appendix II, and agreed-upon and validated by the three countries. b) Action plans developed through this project will allow close and direct cooperation among CITES authorities of the region, and results/outputs will be useful at local, national, and regional scales, as they will be proposed considering the natural habitats of the species by indigenous and local communities in the area, to national producers, managers, and exporters/importers, among others. Moreover, this approach and its achievements could be replicated with other species in the future and shared as best practice, useful to other countries.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

[See outcomes, performance measures and outputs detailed in the table of tasks, above.]

- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking the project, considering these points:**
    - **The value-added of doing it under the CEC cooperative program**
    - **Any other public, private or social organizations that work on such activities**
    - **Opportunities to cooperate and/or leverage resources with such organizations**

The CEC approach covers linkages between trade/economy and ecosystems aimed at sustainable development through environmental cooperation, protection of flora and fauna, and fulfillment of the legal framework. Moreover, the CEC's cooperative work program is oriented toward taking positive steps to build a North American economy that minimizes the potential for negative environmental impacts, while enhancing competitiveness of key industrial sectors in the region.

CITES is a trade convention that promotes the conservation of species through sustainable and legal international trade. Mexico, Canada and the United States are Parties to this Convention and together they comprise the North American CITES Region. This project focuses on improving trade in species of common regional interest, selected from the list in CITES Appendix II, in a sustainable, legal and traceable way for the three countries, according to CITES and sustainable development frameworks and involving indigenous and local communities and producers, in securing fair sharing of benefits from such trade.

Although CITES itself provides guidance and a legal international framework for sustainable trade, implementation at a national and regional level is primarily left to the Parties' initiatives and resources (mainly from CITES authorities). Cooperation channels and facilities, such as those provided by the CEC's cooperative program, could benefit such efforts and, considering that this is the first CITES-oriented project submitted to the CEC, could be a good opportunity to strengthen a specific cooperative framework regionally for this group of species.

There are also many private and social organizations working at local level to promote sustainable use of CITES-listed species. However, their involvement would be defined as the priority list of species is agreed upon and action plans are developed, wherein relevant stakeholders will be identified and invited to participate in the project.

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- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

The project with the CEC is expected to finish by late 2016. By then, action plans will have been implemented for six months, and some tangible results in the functioning of value and production chains will have been achieved. These action plans will continue afterwards, probably with some support and follow up from CITES authorities and, hopefully in a self-funded manner, as benefits from trade of some Appendix-II priority species will be already available—allowing project activities to continue over the long term. Action plans will include specific objectives, tasks, and performance measures to assess impacts on the conservation status of the species and their habitats, as well as on the benefits for stakeholders.

- **Where applicable, identify with reasonable specificity:**

  - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**

After consulting the CEC web page devoted to project publications (mainly the Ecosystems section), it seems there have not been many projects dealing with direct sustainable use and trade of particular species, as the present project proposes to do. However, we found at least three past projects that could serve as useful background and input:

    - Illegal Trade in Wildlife - A North American Perspective (Project publication, Sep 30, 2005): This overview of the global trade (legal and illegal) in wild fauna and flora, the global and North American response to illegal trade, and the gaps, obstacles and challenges to improve implementation of CITES in the region could be useful in developing the priority list and the action plans for the current project.

    - Americas Sustainability Issues - Biodiversity, Indigenous Knowledge and Intellectual Property Rights (Project publication, Mar 15, 2005): This analysis and its recommendations on the linkages and interconnections between environmental, social and trade regimes, as well as ideas to support indigenous people's traditional knowledge, will provide better understanding on how to incorporate such elements into the action plans for the priority species, involving all sources of information and all stakeholders of the production and value chains.

    - The Potential Market for Sustainable Coffee in North America (Project publication Nov 30, 2001): The experiences herein on accessing markets, analysis of consumers and demand of products, cooperation and consultations with the industry, among other elements, will provide valuable ideas to improve production and value chains for priority species, as well as to facilitate involvement of private sector, especially as the results of the project went on to have considerable impact on the North American retail coffee trade.

  - **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project:**

The target audience for the project includes the owners/producers who use the species to be selected and who will have direct influence in the conservation of species and of their habitats. This project places particular emphasis on indigenous and local communities, as well as on other relevant actors in the value and production chains, including CITES authorities. Information on and details of the action plans will be presented and validated by stakeholders at workshops that will allow for participation by all relevant actors.

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- **The beneficiaries of capacity building activities that the project may include the relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome:**

All sectors will be involved in the implementation of the action plans. Specific people, organizations, institutions and authorities will be identified as needed for the action plan of each species.

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Project 10: Greening of Chemicals Management in North America	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$525,000 **Year 1: C$165,000** **Year 2: C$360,000**	

Strategic Priority/Subtheme

- Green Growth / Sustainable Production and Consumption

This project aligns with the Green Growth strategic priority and Sustainable Production and Consumption subtheme, by working on enhancing the alignment of trade statistics and enhancing sustainable use of chemicals in products.

How will this project address the cross-cutting themes?

The project is an opportunity for the CEC to contribute to enhancing information sharing, transparency, and capacity building of government officials in *all countries*, in areas where there are trilateral gaps in knowledge.

The trade component of the project will also assist with assessing the progress of implementing trade-related requirements for the three countries under the Minamata Convention.

Project Summary (including a clear statement of project goal)

Project Goal: This project aims to address two important aspects of chemicals management in North America pertaining to trade and chemicals in products:

1) Enhancing the alignment of North American trade statistics on elemental mercury and mercury-containing products, to assess the progress of the implementation of the Minamata Convention on Mercury ($75,000)
2) Furthering the understanding of the migration of chemicals from manufactured items and subsequent human exposure to them and/or to their releases to the environment ($450,000)

The **trade component** of the project would enable the CEC to characterize the issue and will consist of these five steps:

1) Describe the procedures for generating trade statistics for mercury and mercury-containing products in each country.
2) Identify discrepancies among the three countries.
3) Ask customs and other agencies in each of the three countries for suggestions on how to improve the accuracy and consistency of mercury trade data.
4) Assess the state of the trade statistics within North America
5) Recommend solutions or further study needs.

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The **chemicals in products component** of the project would enable the CEC to contribute to enhancing information, transparency, capacity building and communication on ecological and health exposure to chemicals of trilateral interest. This work will build on the current CEC project, "Enhancing Trilateral Understanding of Flame Retardants of Common Interest and their Use in Manufactured Items." While the 2013-14 project focused on supply chain information and testing of concentrations of flame retardants in manufactured items, this project will further our understanding of the migration of chemicals of concern out of products commonly used by consumers. The project objective will be to gain an understanding of ability of chemicals possessing significant hazard to human health and/or the environment to migrate from commonly manufactured items by testing their potential for emissions, polymer degradation, dermal migration and/or leaching. The project may also address migration of chemicals from aged manufactured items to environmental media. The specific chemicals and manufactured items of trilateral interest to be tested will be determined in Year 1, based on the highest priorities of the three countries. Government laboratory experts would be consulted to help develop the approaches for testing, which would likely be conducted by a third-party consultant. In year 2, the project could include a workshop/training for Mexican laboratories to enhance their ability to quantify the chemical content and potential for human exposure and environmental release from manufactured items chosen for focus in this study. This project would allow Canada, Mexico and the US to enhance information-sharing and collaborative work to increase our understanding of how the environment and human populations may be exposed.

Short-term Outcomes (at halfway point)

Through the completion of Task 1 (see below), the three countries will have a better understanding of how mercury trade statistics are generated in each country.

The scoping phase of Task 2 will provide a greater understanding of the technical issues surrounding exposure to and release of chemicals, due to their migration from products, and increase the region's analytical capacities in this area.

Long-term Outcomes (by the end of the project)

The completion of Task 2 specific information will be generated relating to the migration of chemicals from products. Government officials have an increased understanding of the ability of chemicals, with identified human health and/or ecological hazards, to migrate from manufactured items and of exposure pathways *(specific chemicals and manufactured items of focus will be determined, based on highest priorities of the three countries).*

Longer-term, Environmental Outcome (post-project)

Appropriate action is taken on recommendations for improving harmonized methods in Canada, Mexico, and the United States for reporting mercury trade flows that are in line with the Minamata Convention obligations.

The three countries have integrated the information generated on chemical migration from products into their domestic processes, and relevant information is shared with interested countries and with appropriate international fora (e.g., Organization of Economic Cooperation and Development (OECD), Strategic Approach to International Chemicals Management (SAICM)).

Performance Measures (quantified SMART measures)

TASK 1:

- By 2017, the three countries have a clear picture of how trade statistics related to Elemental Mercury and Mercury-added Products are generated in the three countries.
- By 2017, the three countries know where discrepancies lie in the generation of trade statistics within the three countries.
- At project end, representatives involved with management of industrial chemicals from Health Canada (HC), Environment Canada

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(EC), US Environmental Protection Agency (US EPA), *Instituto Nacional de Ecología y Cambio Climatico* (INECC), and *Secretaría de Medio Ambiente y Recursos Naturales* (Semarnat), find the recommendations of the report useful.

TASK 2:

- By 2017, new scientific information is generated on how certain chemicals of common concern migrate from manufactured items chosen for study.
- By 2017, the three countries are aware which chemicals (of the selected list that are of common concern) migrate from the manufactured items chosen for study.
- At project end, representatives working at HC, EC, USEPA INECC and Semarnat in areas dealing with management of industrial chemicals find that the report will be useful to the regulators and enforcement officials in their risk assessment and risk management efforts.

Task #1) Enhancing the alignment of North American Trade Statistics on Elemental Mercury and Mercury-added Products, to support the Minamata Convention on Mercury

Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Scoping phase and contract for consultant to facilitate the project	1. Trinational trade data are collected by the consultant and an analysis of the data (consistency, completeness, comparability, etc.) is presented in a report 2. Procedures for generating trade statistics for mercury and mercury products in each country are identified and outlined in a report by the consultant 2. Discrepancies and data gaps among the three countries (trade data and procedures) are identified 3. Customs agencies and statistics agencies (to be confirmed) in each of the three countries are interviewed by consultant to assist in providing context on the issue and any suggested solutions	Results can be used to increase alignment of North American trade statistics on elemental mercury and mercury-added products.	Sept. 2015–June 2016	Year 1: $65,000

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	4. Analysis report prepared by consultant characterizing the trade statistics issues (through examples and case studies) and recommended solutions or further study needs			
1.2 Document summary findings	1. Publication and translation of document on trade statistics for mercury			Year 2: $10,000
Task #2) Furthering the understanding of the migration of chemicals from manufactured items and subsequent human exposure and/or releases to the environment				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Scoping and developing approach for testing migration of chemicals from manufactured items, including any required test method development and/or conducting pilot tests	An internal report providing framework for testing as well as preparatory work leading into the testing phase Refined test methods Results of pilot testing (if applicable)	Government officials will have a greater understanding of specific technical issues.	Sept 2015-June 2016	Year 1: $85,000
2.2 Completing testing of manufactured items and developing project reports	Results from tests of the migration of chemicals from products	Information will have been generated to assist officials in the assessment of human exposure and/or environmental release of chemicals from products.	July 2016-June 2017	Year 2: $300,000
2.3 Project management and documentation (working group meetings, teleconferences, document publication/translation)	Year 2: Publication and translation of document on migration of chemicals from manufactured items			Year 1:$15,000 Year 2: $25,000
2.4 Capacity building for government laboratories in Mexico	2.4.1 Develop a training workshop for government technical operators involved in analytical measurements of chemicals of concern. Training may be undertaken by an external laboratory	Capacity building training will enhance the ability of national operators in Mexico to quantify the chemical contents of manufactured	By June 2017	Year 2: $25,000

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	with expertise in methods of interest to this project (to be determined).	items and their potential for human exposure and environmental release. This information will aid government officials in making decisions about such products.		

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

This project aligns with the Green Growth strategic priority and Sustainable Production and Consumption subtheme, by working on enhancing the alignment of trade statistics and enhancing sustainable use of chemicals in products.

The project is an opportunity for the CEC to contribute to enhancing information, transparency, and capacity building of government officials in *all countries*, in areas where there are trilateral gaps in knowledge.

The trade component of the project will also assist with assessing the progress of implementing trade-related requirements for the three countries under the Minamata Convention.

- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

Trade Component - The Minamata Convention will require parties to restrict exports and imports of elemental mercury as well as not allow, or take measures with respect to, certain mercury-containing products. To track progress on trade in Canada, Mexico, and the US once the treaty enters into force, it is necessary to have a reliable baseline of imports and exports for mercury and mercury products. This project will identify recommendations to reduce discrepancies in mercury trade data in North American countries. One difficulty is that the Harmonized Schedule, which all three countries use, lacks tariff codes for many of the mercury products that the Minamata Convention will address. Of note – in the case of Canada and the US, there is a Memorandum of Understanding on the Exchange of Import Data between Statistics Canada and United States Census Bureau, signed in 1987.

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Chemicals in Products Component - This effort would also complement related initiatives being undertaken by countries involved in the Organisation for Economic Co-operation and Development (OECD) Environment, Health and Safety (EHS) Programme, which is structured on the United Nations Strategic Approach to International Chemicals Management (SAICM). The OECD EHS Programme is currently working on developing harmonised tools for assessing the exposure of chemicals to humans and the environment. The proposed CEC project results could be shared to contribute to the larger OECD work. This project may also support the work of the other United Nations Environment Programme Multilateral Environmental Agreements on chemicals.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

Trade Component - This project will identify how to improve the accuracy of mercury trade statistics generated within the three countries, thus allowing better tracking of trade of mercury and mercury products once the Minamata Convention enters into force.

Chemicals in Products Component - This project will also contribute to closing an information gap which exists both in a North American context and internationally, with respect to understanding the migration of harmful chemicals from manufactured items. A specific set of chemicals and manufactured items of trilateral interest will be selected during the scoping stage of the project.

See performance measures outlined above.

- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking the project, considering these points:**
    - **The value-added of doing it under the CEC cooperative program**
    - **Any other public, private or social organizations that work on such activities**
    - **Opportunities to cooperate and/or leverage resources with such organizations**

The CEC provides a venue to work on improvements to generating reliable mercury trade statistics, on a NAFTA-country level.

The CEC is also an effective venue to examine the migration of chemicals from manufactured items this can contribute to improved chemicals management in all three countries. The OECD Environment Health and Safety Programme is currently working on developing harmonised tools for assessing the exposure of chemicals to humans and the environment. The proposed CEC project results could be shared to contribute to the larger international OECD work.

- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

Yes. The first component of this project (mercury trade statistics) will conclude in June 2016. The second component of this project will conclude in June 2017. Given that the project will contribute to larger international efforts, the work will continue to have impact after CEC involvement ends.

- **Where applicable, identify with reasonable specificity:**

    - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**

The SMOC Working Group could consult the Enforcement Working Group, as appropriate, to capitalize on their experience on enforcement amongst border officials. This project also builds on the expertise developed under previous SMOC work with respect to testing manufactured items for the presence of flame retardants. The previous project only tested for presence of the chemicals. The proposed project will seek to address the more complicated issue of migration of the chemicals out of the manufactured items.

    - **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**

The target audience is regulators and enforcement officials within the risk assessment and risk management communities of the three Parties. The Parties are receptive and capable of using this information to assist them in addressing the issues of chemicals management. The international community of OECD countries in the OECD Environment Health and Safety Programme are also capable of using the information to be generated.

    - **The beneficiaries of capacity building activities that the project may include**

This project will assist in capacity building within all three Parties.

    - **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

The following stakeholders may be engaged, as appropriate, in the implementation of this project and/or in disseminating the project results:

- Border officials and trade statistics officials
- OECD Secretariat of the OECD Environment Health and Safety Programme
- Private contract laboratories
- Universities and research centers

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Project 11: Arctic Migratory Birds Initiative (AMBI)—the Americas' Flyway Action Plan	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$460,000 **Year 1: C$230,000** **Year 2: C$230,000**	

Strategic Priority/Subtheme

- Sustainable Communities and Ecosystems / Priority Species and Ecosystems; Landscapes and Seascapes; and Sustainable Communities and Urban Initiatives

This project addresses the Sustainable Communities and Ecosystems strategic priority and all three sub-themes of the priority (Priority Species and Ecosystems, Landscapes and Seascapes, Sustainable Communities and Urban Initiatives). The project focuses on two Arctic shorebirds that have been identified as being at-risk and a high conservation concern in all three countries and that are good indicators of overall biodiversity health. The project also focuses on key sites in the three countries along Atlantic and Pacific flyways that host migrating and over-wintering shorebirds, and involves linking communities along the flyways to enhance engagement, communication and information between these communities to enhance the sustainability of these communities to support conservation actions. This will also benefit other shorebirds, people and biodiversity that occur in these habitats.

How will this project address the cross-cutting themes?

Learning from and assisting vulnerable groups and indigenous communities

This project is a component of the Arctic Migratory Bird Initiative (AMBI) and will enhance sustainable communities and ecosystems in the Arctic and along the Pacific and Atlantic coastlines using the Western Hemisphere Shorebird Reserve Network (WHSRN) as a tool to engage in site-based conservation at key habitats used by two species that are of high common conservation concern. A premise of WHSRN is that conservation is best achieved when local communities are engaged and leading activities that support local ecosystems and economies. Many of the important habitats for shorebirds are on lands used by indigenous communities in Canada, the United States and Mexico. Therefore, the focus of this project will be to approach communities, including indigenous communities, next to key habitats that are not part of the WHSRN network, and to increase engagement at others that are already within WHSRN to support local efforts to maintain habitat for Arctic-breeding shorebirds. The compilation of information to support conservation efforts will include information derived from traditional and local knowledge. The successful implementation of the project should benefit local sustainable use of habitats and will generate as-yet undetermined benefits after communities are linked to others along the shorebird flyways.

Enhancing information sharing, transparency, capacity building and communication

Through local engagement, it is expected that existing science and local and traditional knowledge combined will enhance the ability of both streams of knowledge to support conservation. Sites that host the same shorebird populations as they move through the continent each year will be linked according to migration pathways: one along the Atlantic and one along the Pacific. As a North American-focused

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effort within the broader WHSRN program, this work will contribute to a number of the objectives identified by the CEC-initiated North American Bird Conservation Initiative (NABCI). In doing so, this project would revitalize the continental implementation of NABCI.

Web-based products and meetings will support transparency and communication. Where indigenous communities are involved, the expected outcomes will represent an innovative step forward as they become engaged for the first time in the type of international conservation partnership that is proposed.

Project Summary (including a clear statement of project goal)

The goal of this project is to improve conservation outcomes for at-risk shorebirds by informing, engaging and connecting communities in Canada, the United States and Mexico at key sites that share responsibility for their well-being.

This project is a component of the Arctic Migratory Birds Initiative (AMBI), a project of the Arctic Council, whose initial work plan focuses on the conservation of two shorebird species: the Semipalmated Sandpiper (*Calidris pusilla*) and the Red Knot (*Calidris canutus; rufa* and *roselaari* subspecies). A foundational principle of AMBI is that conservation work is needed in all countries—be they in the Arctic or further to the south. A common characteristic of migratory shorebirds is their tendency to congregate at key sites on migration or during the winter. This poses a real conservation concern as the loss of one habitat could adversely affect the entire species, but it also provides opportunity, if communities at the sites are engaged and motivated to provide support for these vital habitats. This project aims to foster these opportunities by supporting community efforts at the most important habitats for two species that have very broad breeding ranges and have been identified as key biodiversity indicators for other co-occurring species.

This work will build upon and complement existing conservation efforts for Semipalmated Sandpipers and Red Knots in North America, including the Western Hemisphere Shorebird Reserve Network program, the Atlantic Shorebird Flyway Conservation Business Strategy, and the Pacific Shorebird Conservation Business Strategy. It will also benefit from experiences learned from a previously funded CEC project that linked sites in Saskatchewan, Utah and Sinaloa, which shared populations of American Avocets.

Short-term Outcomes (at halfway point)

1. Sites on Atlantic and Pacific flyways are identified as being critical for the conservation of the two species and that provide a good fit for subsequent linking to other sites.
2. Local communities are engaged in developing site-specific conservation action plans and initiate efforts to forge linkages among sites.

Long-term Outcomes (by the end of the project)

1. Identified conservation actions are implemented.
2. Linked sites along the Pacific and Atlantic coasts are actively sharing information and producing conservation outcomes.

Longer-term, Environmental Outcome (post-project)

Linkage efforts are expanded along flyways into South America and are examples for other networks that may form in support of other species and/or geographic areas.

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Performance Measures (quantified SMART measures)

Outcome	Measure	Target	Indicator
Sites are identified	New and existing sites that share Semipalmated Sandpiper and Red Knot populations have been identified, including their key threats. At a minimum, one site from each country is included.	3 new WHSRN sites are nominated and part of the WHSRN program	Web site is available in English, French, Spanish as well as indigenous languages to show sites, habitat characteristics, and threats that are important for each species
Local communities are engaged	Key shorebird habitats and the communities associated with them are recognized within the WHSRN program and representatives from the sites identified have collectively developed an action/business plan that addresses threats at a site and network level.	New and existing sites that share Semipalmated Sandpiper and Red Knot populations have identified their key threats and have an action plan in place to address them	Availability of action or business plans that specifically indicate the most important actions needed at each site will be available in each language
Conservation actions are implemented	Implementation results for key conservation actions at a subset of key sites for each species	100% of identified conservation actions are implemented	Availability of results in reports in appropriate languages
The people at WHSRN sites in all three countries are linked and benefiting from the strength of their participation in networks	Partnerships between site representatives are formed along Atlantic and Pacific flyways	100% success rate in linking site partners in the network	Establishment of conservation networks beginning with the subset of key sites

Tasks necessary to reach the environmental outcome:

1) Sites are identified and local communities are engaged
2) Threat assessments are completed and network-level action planning and implementation is undertaken
3) Linkages are established among sites resulting in enhanced conservation at sites

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Task #1) Sites are identified and local communities are engaged				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Compile a list of all sites known to host Semipalmated Sandpipers and Red Knots, with special attention to locating habitats in the Arctic that are considered resilient to climate change	Website is available to show sites and habitat characteristics that are important for each species	Information is available to support conservation action and decision-making	Early in year 1	Year 1: $40,000 Year 2: $0
1.2 Engage communities, ensuring Arctic and indigenous communities are included, at WHSRN sites of hemispheric or international importance, or in landscapes of importance for both species	Identification of sites that are key for the conservation of the two species and are interested in engaging with other sites in a conservation network. At minimum, one site from each country is included.	Sites that will be the focus of the project are identified within the full set of potential sites	Year 1 only	Year 1: $10,000 Year 2: $0
1.3 Support nomination of any sites not currently part of the WHSRN network (sites of hemispheric and international importance)	Key shorebird habitats and the communities associated with them are recognized within the WHSRN program	All critically important stopover or overwintering habitats benefit from the WHSRN program	Some sites may need two years to ensure full community / landowner support.	Year 1: $80,000 Year 2: $20,000
1.4 Establish connectivity between sites for Red Knots (*roselaari*) along the Pacific flyway and Semipalmated Sandpipers along the Atlantic.	Migration routes showing connections between breeding, wintering and migration sites are determined using telemetry	Importance of sites and connectivity between sites is demonstrated.	Year 1 and Year 2	Year 1: $30,000 Year 2: $30,000

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	technologies; stopover duration at sites may be determined			
Task #2) Threat assessments are completed and network-level action planning and implementation is undertaken				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Known threats are compiled for all sites hosting Semipalmated Sandpiper and Red Knot using existing information, as well as information derived from traditional and local knowledge. Threat analysis will include the potential for exposure to pollutants and contaminants.	Website includes information on known threats at each WHSRN site that supports Semipalmated Sandpiper and Red Knot	Information is available to support conservation actions and management decisions	Early in year 1	Year 1: $10,000 Year 2: $0
2.2 Meeting of site representatives	Representatives from sites identified in subtask 1.2 meet in person to collectively develop an action/business plan that addresses threats at a site and network level. May be accomplished as a single face-to-face meeting or divided by Atlantic and Pacific flyways.	Key actions are identified and a path forward is described to resolve each threat.	Year 1	Year 1: $50,000 Year 2: $0
2.3 Based on 2.1, conduct actions at sites on Atlantic and Pacific flyways	Actions identified in subtask 2.2 are implemented. Actions may range from enhancing community	Actions are implemented that will lead to measurable conservation results,	Later in Year 1 and Year 2	Year 1: $10,000 Year 2: $100,000

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	awareness to implementing citizen science activities (e.g., monitoring), habitat management, and addressing pollution issues.	noting that some results may not be measurable until subsequent years.		
Task #3) Linkages are established among sites resulting in enhanced conservation at sites				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 A linking program is established among Atlantic and, separately, Pacific sites supporting Semipalmated Sandpipers and/or and Red Knots. Communities are connected with other communities along the flyway that share the same bird populations	Partnerships between site representatives are formed along Atlantic and Pacific flyways, as a legacy of the current funding.	Capacity is established to continue conservation efforts into the future and a group is established that can evaluate ongoing success of implementation activities. Communities are aware that they steward a shared resource.	Year 2	Year 1: $0 Year 2: $80,000

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**
  - *Sustainable Communities and Ecosystems – Priority Species and Ecosystems, Landscapes and Seascapes, Sustainable Communities and Urban Initiatives*
    - The main outcome expected from the proposed work is that communities that are local to important habitats for Semipalmated Sandpiper and Red Knot experience enhanced sustainability in their use of these areas, such that shorebirds, people and the biodiversity that occurs in these habitats will benefit. This could represent direct economic benefits, if the habitats are used by the communities, or secondary benefits, from the ecosystem services that healthy habitats will offer. These broader-than-bird outcomes are based on the established understanding that birds represent good

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indicators of overall biodiversity health so while the focus of this work is to benefit declining Arctic-breeding shorebirds, most of the species that they share habitats with will benefit from its results.

Cross-cutting themes

- *Learning from and assisting vulnerable groups and indigenous communities*
  - Many of the important habitats for shorebirds are within the lands used by indigenous communities in Canada, Mexico and the United States. These communities can expect to see benefits as conservation outcomes benefit shorebirds that use local habitats and in the process of doing so, benefits to other biodiversity that use those same areas. Successful implementation should benefit local sustainable use of habitats and will generate as-yet undetermined benefits after communities are linked to others within the shorebird flyways.
- *Enhancing information, transparency, capacity building and communication.*
  - The success of this work hinges on all components of this theme. Through local engagement it is expected that existing science and local and traditional knowledge combined will enhance the ability of both streams of knowledge to support conservation. Web-based products within the project will support transparency and the process of linking communities at sites will inherently result in increased capacity and communication among important habitats. Where indigenous communities are involved, the expected outcomes will represent an innovative step forward as they become engaged for the first time in the type of international conservation partnership that is proposed. Results from telemetry projects will inform conservation efforts and provide tangible evidence for the responsibility communities share for the well-being of shorebird populations.

- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**
  - The outcomes of this project are North American in scope, as efforts will focus at key sites for Semipalmated Sandpipers and Red Knots in the three countries along Atlantic and Pacific flyways. The two species that are a focus of this project are either identified as being at-risk (Red Knot) or are a high conservation concern (Semipalmated Sandpiper) so the Parties will also be able to announce results that positively affect their recovery towards sustainable populations. It is also recognized that the full range of both species extends south into South America, so additional value-added will be obtained when successful efforts in North America attract funding from other sources to expand efforts through to South America.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**
  - A website identifying all key sites used by each species and the specific threats encountered at each ensuring information is available in English, French, and Spanish, as well as indigenous languages for communities involved in this work.
  - Action or business plans that specifically indicate the most important actions needed at each site will be available in each language.

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- Implementation results at a subset of key sites for each species, as developed by all site partners that will include communities, NGOs and governments.
- Establishment of conservation networks, beginning with the subset of key sites but recognizing that additional benefits will be gained if sources of funding can be found to expand this work into the Caribbean and into Central and South America.

- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking this project, considering these points:**
  - **The value-added of doing it under the CEC cooperative program:**
    - The CEC is uniquely positioned to provide continental-level support for conservation of species that migrate among the three countries.
    - The outcomes of the proposed activities also contribute to objectives of the North American Bird Conservation Initiative, which was initiated through a significant investment by the CEC.
  - **Any other public, private or social organizations that work on such activities:**
    - Shorebirds are a federal responsibility in all three countries, so federal wildlife and habitat agencies are involved to an extent in their conservation. Overall, shorebirds are in decline as a group and are, therefore, the interest of a number of bird-focused NGOs. The Western Hemisphere Shorebird Reserve Network (WHSRN) is an initiative of both public and private representatives from many countries in the Americas (including Canada, the United States and Mexico) and is likely to be a key contributor to this work.
    - WHSRN has a proven track record for cultivating community awareness and commitment to conservation at important shorebird sites. As an example, Río Gallegos, an important over-wintering site for Red Knots in southern Argentina, has special protections afforded to their habitat by the federal and municipal governments, as well as strong community involvement in a small conservation centre that houses permanent interpretation displays and hosts well-attended events in support of the habitat there. These achievements can be directly linked to efforts of the Western Hemisphere Shorebird Reserve Network. In some cases, WHSRN has achieved conservation support through the involvement of industries that are active at important shorebird sites. Examples include the California Rice Commission, which works with WHSRN on developing best management practices in their fields in support of shorebirds, and the Ecuasal salt company in Ecuador, which manages its salt evaporation operations in a manner that supports shorebirds and other water birds.
    - Likely, key NGOs involved in the WHSRN program will become involved in the implementation of this work. Included will be the Manomet Center for Conservation Science that houses the WHSRN office and staff, as well as WHSRN partners in Mexico (including Pronatura and *Amigos de Sian Ka'an*), the United States (Point Blue, Friends of Delaware Bay) and Canada (Nature Canada, the Nature Conservancy of Canada and Bird Studies Canada).
  - **Opportunities to cooperate and/or leverage resources with such organizations:**
    - With the development of the Atlantic Flyway Shorebird Initiative and a similar effort developing for the Pacific Flyway, key funding organizations, such as the National Fish and Wildlife Foundation and the US Neotropical Migratory Bird Conservation Act, are beginning to support efforts like the work described in this project. Much of the work described in

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this outline is scalable, depending on funding levels such that greater results may be obtained if CEC funding is matched with that of other organizations. In addition to enhancing linkages within North America, sufficient additional funding could also be used to link North American efforts to similar work for these species in Central and South America.

- On the Atlantic flyway, AMBI site-based conservation work will link complimentary goals of the WHSRN program and the Atlantic Shorebird Flyway Initiative (ASFI). AFSI is housed with the Atlantic Coast Joint Venture, which brings together public and private agencies, conservation groups, and other partners focused on the conservation of habitat for native birds in the Atlantic Flyway of the United States. Early on, they realized that to be successful, this initiative would need the participation of partners in other countries, and have since reached out to governments and NGOs from all countries along the Atlantic Coast of North and South America. A recent ASFI document lists the first activity in its objective regarding habitat loss and change as, "engaging constituencies to build support for conservation of shorebirds and wetlands." The expected outcome of this activity is that "actions are implemented by governments and NGOs at 30 priority areas to increase the public's interest in and concern for shorebirds." The activities proposed for this funding from the CEC will contribute directly to this ASFI objective.
- On the Pacific Flyway, AMBI site-based conservation will also link to complimentary goals of the WHSRN program but will also work in cooperation with Pacific-based international shorebird conservation work, including the Copper River International Migratory Bird Initiative (CRIMBI) and the developing Pacific Shorebird Flyway Initiative. CRIMBI is a US Forest Service initiative that seeks to strengthen conservation of migratory birds along the entire Pacific flyway—from the North Slope of Alaska to the southernmost reaches of the Pacific Coast–through effective international partnerships and action on the ground. CRIMBI has been actively involved in working with WHSRN to develop shorebird conservation activities at WHSRN sites along the Pacific Coast of North America, the proposed activities using CEC funding would build on this work in partnership with both organizations. While the Pacific Flyway Shorebird Initiative is still under development, it is expected that CEC funds directed towards community support at shorebird sites will contribute to habitat objectives within that business plan.

- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**
  - Yes, tangible results are expected at the end of the current funding cycle. However, since there will be conservation efforts that will not be completed at proposed funding levels, there is potential for reaching out to external funding or potential continuation afterwards. A key outcome of this funding will be the establishment of a network of site partners that will continue beyond the current two-year window. These groups will have the potential to seek funding from a number of sources, such that the legacy of CEC funding will stretch many years into the future.

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- **Where applicable, identify with reasonable specificity:**
  - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**
    - A similar project in the 1990s linked important shorebird sites in central Canada, US and Mexico, which remains active to this day. These three communities share populations of American Avocet and are linked through annual shorebird festivals at each site that highlight to the communities the importance of maintaining habitats for the shorebirds that travel among the sites throughout the year. It will be used as a model of success for the networks that will be formed using this funding.
  - **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project.**
    - The project includes partners at the subset of important sites chosen for this project, as well as communities and conservation practitioners at other sites in North America and beyond. It will also build on existing conservation networks that may be present in each of the regions targeted by this work to prevent the need for building new capacity. As communities and local conservation capacity are engaged, ancillary benefits will be obtained for the biodiversity sharing the same habitats.
  - **The beneficiaries of capacity building activities that the project may include**
    - Local communities and other site partners, including indigenous communities as well as the scientific community and shorebird habitat conservation partnerships.
  - **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**
    - All communities adjacent to key shorebird sites will benefit, as will NGOs that are active at any one of the sites chosen for the focus of this work. Many sites are within the territory of indigenous communities, which will be a special focus of this work: providing them with information, capacity and linkages to other communities that share the same shorebird populations during their annual migration across North America.

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Project 12: Engaging Farmers and Other Landowners to Support Monarch Butterfly and Pollinator Conservation	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$300,000 **Year 1: C$150,000** **Year 2: C$150,000**	

Strategic Priority/Subtheme

- Sustainable Communities and Ecosystems / Priority Species and Ecosystems; and Sustainable Communities

This project will provide leadership and knowledge for improving and restoring habitat for the Monarch butterfly, a beloved species that traverses all three North American countries during its annual migratory cycle.

How will this project address the cross-cutting themes?

- Enhancing information-sharing, transparency, capacity building, and communication

This project will enhance information, transparency, capacity building, and communication by developing a unique model for sharing conservation information with farmers and other agricultural landowners and managers across international borders.

- Learning from and assisting vulnerable groups and indigenous communities

This project will also assist and learn from farmers and private landowners to enhance Monarch butterfly conservation.

Project Summary (including a clear statement of project goal)

Monarch butterflies require a wide range of habitats in Canada, the United States, and Mexico, and conservation of their migratory phenomenon requires trinational cooperation. In June 2007, the CEC Council acknowledged this shared conservation responsibility and instructed the Secretariat to support a multi-stakeholder collaborative effort to develop a North American Monarch Conservation Plan (NAMCP). The 2008 NAMCP provided an account of the species' status, threats to the migratory phenomenon throughout its range, and key trinational collaborative actions for conservation. The 2008 plan identified actions to address habitat loss and degradation in Monarch breeding areas as critical priorities.

Although the charismatic Monarch butterfly and its migrations have garnered much public, scientific, and governmental conservation attention since release of the 2008 plan, this iconic species continues to face steep and significant population declines. The number of Monarch butterflies in the overwintering colonies in Mexico reached a 20-year low during the 2013–2014 season. Limiting factors are numerous, including an extensive loss of milkweed, the Monarch's sole larval food source, due to changes in agricultural practices; urban and suburban development; land management activities, such as mowing and herbicide applications along roadsides and rights-of-way; use of insecticides; and severe weather events likely related to climate change.

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Significantly, the most drastic habitat losses since 2008 have occurred in the "Corn Belt" of the Upper Midwestern US and is likely in southern Ontario and Quebec, the heart of the eastern Monarch's breeding ground and the major source of Monarchs overwintering in Mexico. Eradication of common milkweed in and around farm fields due to widespread adoption of glyphosate-resistant corn and soybeans has resulted in extensive habitat loss. The data show a direct relation between the loss of milkweed host plants in agricultural areas in the US and the number of Monarchs wintering in Mexico. Texas is important as Monarchs leaving Mexico stop to lay eggs for their first generation on their way north and for nectar on their way south. Northern Mexico is also an area that is important for migrating Monarchs to fuel up on nectar as they fly north and south during their spring and fall migrations. Thus, it is key that restoration of regionally-appropriate native milkweeds and regionally-appropriate native nectar plants, and implementation of "Monarch-friendly" land management practices focus in these areas. Addressing habitat restoration and enhancement in these important areas is a priority for all three countries as they work together to update the 2008 NAMCP and develop a Trinational Action Plan.

The overarching goal of this project is to promote habitat restoration and enhancement in key breeding grounds and migration corridors in Canada, Mexico, and the US. Much of the breeding habitat lost to Monarchs has been in agricultural fields. This poses a challenge, since restoration efforts must occur in areas in which there is strong pressure on land use from agricultural interests. This project will address this challenge by reaching out to agriculture communities, organizations, and agencies in all three countries using audience-appropriate publications, full-day short courses, workshops, and webinars to provide practical, tested guidance about how to install and maintain Monarch-friendly restoration plantings. The most important project outcomes will be promotion and sharing of information about Monarch and pollinator conservation in areas currently dominated by agriculture. Farmers and private landowners can play an important role in the conservation of Monarch butterflies and other native pollinators, and this project will provide evidence to farmers and agency personnel that Monarch habitat and agriculture are compatible.

This proposal will create a compendium of information for farmers, other landowners, and land managers as well as lasting partnerships at the regional, national, and continental scales to ensure that Monarch-friendly practices are adopted and landscapes are managed over the long term. The proposal combines community-level involvement and multi-agency partnerships, and will demonstrate that Monarch conservation can be incentivized across private lands in Canada, Mexico, and the United States.

Short-term Outcomes (at halfway point)

- Guidelines and other materials that capture beneficial management practices for restoring and managing Monarch habitat.
- Workshop, webinar, and full-day short course curriculum developed and outreach events scheduled throughout the Monarch range.

Long-term Outcomes (by the end of the project)

- Audience-specific information on Monarch habitat restoration and management, including the following:
  1) Guidance on how to evaluate Monarch habitat, including Monarch use of habitat via monitoring.
  2) Step-by-step guidance for site preparation, planting methods, and weed management; tailored to specific ecoregions and types of agricultural habitat (e.g., row crops, roadsides, pasture, yards).
  3) Direction on how to manage farm landscapes for Monarchs. This includes managing habitat for the benefit of Monarchs as well as mitigating the impact of pesticides on Monarchs and their habitat.
  4) Workshops and other education events in Canada, Mexico, and the US, for farmers, landowners, and agency/NGO staff on

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sustainable, Monarch-friendly practices in agricultural areas.

Longer-term, Environmental Outcome (post-project)

The longer-term outcome will be additional habitat for Monarchs. Post-workshop surveys for similar efforts to promote adoption of pollinator conservation practices on farms throughout the US show that 90% of respondents said they were improving management and/or providing additional habitat for pollinators as a result of their participation.

All workshops will be documented, with surveys conducted before and afterwards. The surveys will be designed to estimate commitment to engage in Monarch conservation, education, or monitoring; overall usefulness of the workshop; and suggestions for improvement or additional information or resources needed.

Initial and continued outreach to native-seed producers, landowners, agency staff, and other workshop participants will help to inform the success of and needed improvements to this approach to conservation. We will facilitate the creation of a network of individuals experienced with Monarch habitat restoration and management to continue communication beyond the life of the project.

Performance Measures (quantified SMART measures)

Outcome	Measure	Target	Indicator
By 2017, the development, compilation and distribution of best practices for Monarch habitat restoration and management	Wide dissemination of guidelines and beneficial practices for restoring and maintaining Monarch habitat	100% of materials available on website	Availability of material on website
By 2017, compilation and dissemination of country-specific information on incentives for private landowners that would promote adoption of Monarch conservation beneficial management practices	Wide dissemination of information on incentive programs to promote Monarch conservation through beneficial management practices	100% of materials available on website for each country	Availability of material on website
By 2017, agency staff in the three countries will be trained to provide technical assistance to the target audiences	Training for agency staff farmers, and other landowners and managers is complete	100% of agency staff associated with Monarch conservation efforts trained to provide technical assistance	Number of agency staff trained
By 2017, established partners in Canada, the US and Mexico	Establishment of appropriate networks	Appropriate partners are included in network	Increase in the number of partners in the three countries

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(governmental, nongovernmental, local communities) to participate in regional, national, and continental networks			participating in networks
By 2017, the identification and sharing of existing pilot projects and actions at the regional, national, and continental scales	Tools and practices that support conservation and sustainable management of Monarch habitat	Tools and practices are shared	Increase in the number of tools and practices shared
By 2017, development of a user-friendly Web portal, and all relevant materials posted	Web portal established	Web portal developed and functional	Availability of material on website
By 2017, workshops/short courses delivered to participants in the target audiences (farmers, ranchers, other landowners, and agency staff)	Number of workshop/short courses delivered; number of participants	Workshops/short course in all target areas complete	Workshops/short courses completed
By 2017, development and dissemination of guidelines and other materials that capture beneficial management practices for restoring and managing Monarch habitat through network of agriculture agencies, regional and state Conservation Districts, Monarch Joint Venture partners, and sustainable agriculture contacts	Uptake of beneficial management practices by agricultural community throughout the continent (because all materials will be available in French, English and Spanish)	Wide dissemination of guidelines and beneficial practices for restoring and maintaining Monarch habitat	Availability of guidance in three languages

Tasks necessary to reach the environmental outcome

1. Coordinate, synthesize, and disseminate existing information about agriculture and other related activities on the landscape into guidelines and beneficial management practices that will promote Monarch habitat restoration and management
2. Initiate a continental partnership to identify and implement actions that promote Monarch habitat restoration and management at regional, national, and continental levels.
3. Conduct workshops, all-day short courses, and webinars for landowners and agency staff and disseminate written and Web-based materials.

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Task #1) Coordinate, synthesize, and disseminate existing information about agriculture and other related activities on the landscape into guidelines and beneficial management practices that will promote Monarch habitat restoration and management				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Compile, develop, (and translate where needed), and distribute best practices of Monarch habitat restoration and management Solicit input from local restoration practitioners and landowners to ensure the language and concepts are effective	Wide dissemination of guidelines and beneficial practices for restoring and maintaining Monarch habitat Uptake of beneficial management practices by agricultural community throughout the continent (because all materials will be available in French, English and Spanish)	Develops a set of common practices to promote Monarch habitat restoration and management Provides a framework for Monarch habitat restoration and management	Year 1	Year 1: $50,000 Year 2: $0
1.2 Compile and disseminate country-specific information on incentives for private landowners that would promote adoption of Monarch conservation beneficial management practices (e.g., federal farm subsidy programs; federal, state, provincial and local incentives such as conservation easements).	Web-based dissemination of information on incentive programs that will help private landowners adopt conservation practices	Farmers and other landowners are often unable to afford expensive habitat projects—incentives increase the willingness of farmers and other landowners to take conservation action	Year 1	Year 1: $20,000 Year 2: $0

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Task #2) Initiate a continental partnership to identify and implement actions that promote Monarch habitat restoration and management at regional, national, and continental levels				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Identify appropriate partners in Canada, the US and Mexico (governmental, nongovernmental, local communities) to participate in regional, national, and continental networks; this partnership will use existing alliances and networks where possible, such as those developed under the Monarch Joint Venture	Meetings of experts and partners, including Monarch restoration experts, agency staff and NGOs Establishment of appropriate networks	Develops an expanded network of partnerships to coordinate more effective and efficient conservation and sustainable management actions	Year 1	Year 1: $40,000 Year 2: $0
2.2 Identify existing pilot projects and actions at the regional, national, and continental scales	Tools and practices that support conservation and sustainable management of Monarch habitat	Will demonstrate existing effective strategies of Monarch habitat restoration and management	Year 1	Year 1: $10,000 Year 2: $0
2. 3 Identify joint actions for the identified partnerships to undertake to improve Monarch management practices and develop a priority system for Monarch conservation areas based on ecological need, partner opportunity, and outreach to new partners	Prioritization of actions and best practices to achieve restoration and management of Monarch habitat Will include a prioritization of targeted conservation areas and actions and engage new partners such as First Nations, large landowners, and farmer groups	Provides a continental approach to conservation and management and ensures that communities are armed with knowledge of the importance of their lands and the means by which they can manage them in support Monarchs	Year 1	Year 1: $30,000 Year 2: $0

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Task #3) Outreach: Conduct workshops, all-day short courses, and webinars for landowners and agency staff and disseminate written and Web-based materials				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Develop user-friendly Web portal and post all relevant materials	Will include easy-to-use Web portal with relevant information on habitat improvements and management (specific downloadable guidelines, information on incentive programs, highlights and case studies of Monarch conservation success stories)	Will provide easy access to information and an online community experience where people can share their successes	Year 2	Year 1: $0 Year 2: $20,000
3.2 Plan and conduct workshops, all-day short courses and webinars for agency/NGO staff, farmers, and other landowners on sustainable, Monarch-friendly practices in agricultural areas	Training for agency staff (FWS, NRCS), farmers, and other landowners and managers We will use a train-the-trainer approach to provide agency staff with the knowledge and tools to provide technical assistance to landowners; this will allow the project to reach many more people initially and extend its effective life by years	Provides underpinning of Monarch biology and conservation, and targeted information on Monarch habitat restoration and management Will also include a section on incentives Includes introduction to citizen monitoring programs, as opportunities for landowners to document Monarch use of habitat that they install Will ensure that dissemination empowers proper site preparation, weed control, and use of	Year 2	Year 1: $0 Year 2: $110,000

		locally appropriate quality seed mixes which, as a result, are of higher value to Monarchs		
3.3 Distribute guidelines through network of agriculture agencies, regional and state Conservation Districts, Monarch Joint Venture partners, and sustainable agriculture contacts	Widely available and credible information about restoring and managing habitat for Monarchs in agricultural areas	Supports engagement in conservation practices on farm and ranch lands	Year 2	Year 1: $0 Year 2: $20,000

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

This project contributes to the Council's strategic objective of addressing Sustainable Communities and Ecosystems by providing leadership and knowledge to increase community-level awareness, engagement, and capacity for improving and restoring habitat for the Monarch butterfly, a shared priority species, in transboundary agricultural landscapes. The project builds upon CEC's experience in providing practical tools and training that promote sustainable use and beneficial management practices through trinational conservation partnerships and networks.

- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

Monarch conservation is a continent-wide issue that will require concerted efforts to protect, manage and restore habitat in Canada, Mexico and the United States. Creating habitat that will make a difference to Monarchs cannot be done in a focused area, nor with focused habitat types, and it requires environmental protection on public and private lands in all three North American countries. While only about 10% of Monarch summer breeding habitat is found in Canada, projected changes in climate are likely to increase this proportion, so the partnership

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between the US and Canada is important. Additionally, while most ongoing restoration and protection efforts focus on migratory and fall and spring breeding habitat in the US, Monarchs traverse a large part of Mexico, making the partnership between the southern US sites and Mexico equally important. Given the magnitude of the problem, the only way to support creation of habitat that will make a difference to Monarchs is to educate individual landowners and land managers about how they can create, restore, and manage habitat on their respective properties. Effective Monarch conservation will require engagement of private landowners in agricultural regions, as well as national, state, and local government agencies. Our outcomes—education and dissemination of information—will affect Monarch habitat in key regions in all three North American countries, encompassing prime summer breeding habitat in the northern US and southern Canada, migratory and spring breeding habitat in the southern US and northern Mexico, and migratory habitat in northern Mexico.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

Performance measures include the following:

- By 2017, the development, compilation and distribution of best practices of Monarch habitat restoration and management.
- By 2017, compilation and dissemination of country-specific information on incentives for private landowners that would promote adoption of Monarch conservation beneficial management practices.
- By 2017, agency staff in the three countries will be trained to provide technical assistance to the target audiences.
- By 2017, established partners in Canada, the US and Mexico (governmental, nongovernmental, local communities) to participate in regional, national, and continental networks.
- By 2017, the identification and sharing of existing pilot projects and actions at the regional, national, and continental scales.
- By 2017, development of a user-friendly Web portal, and posting of all relevant materials.
- By 2017, workshops/short courses delivered to participants in the target audiences (farmers, ranchers, other landowners, and agency staff).
- By 2017, development and dissemination of guidelines and other materials that capture beneficial management practices for restoring and managing Monarch habitat through network of agriculture agencies, regional and state Conservation Districts, Monarch Joint Venture partners, and sustainable agriculture contacts.
- By 2017, compilation and dissemination of information on incentives for private landowners that would promote adoption of Monarch conservation principals.

- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking this project, considering these points:**
    - **The value added of doing it under the CEC cooperative program**
    - **Any other public, private or social organizations that work on such activities**
    - **Opportunities to cooperate and/or leverage resources with such organizations**

The CEC is uniquely positioned to support the Parties in achieving their goal of improving habitat for Monarchs across North America. Many of the tasks in this proposal are identified in the 2008 North American Monarch Conservation Plan, which was funded by the CEC. This is truly a

North American issue; Monarchs cannot be conserved without the cooperation of Canada, Mexico, and the United States so the CEC is uniquely placed to address this issue.

CEC funding for this project will leverage the expertise and resources dedicated to Monarch habitat conservation, research, monitoring, and outreach already being carried out by a variety of partners in both the public and private sectors to ensure that the Monarch migratory phenomenon that is such a part of North American culture, scientific discovery, science education, and conservation attention is not lost for future generations.

- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

All project deliverables will be carried out from July 2015 to June 2017. This project expands existing efforts by partners to implement habitat projects for Monarchs and will allow additional outreach to a broader audience base. A key goal will be to use the funds from CEC to leverage additional funds so this project is carried on into the future, and the dissemination materials developed during the funding period will be deliberately designed to be effective for many more years. The tasks will put in place strong continental partnerships, and provide the information needed to assist landowners across a large geographic area in implementing meaningful habitat conservation projects for Monarch butterflies.

- **Where applicable, identify with reasonable specificity:**
    - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**

This project builds directly on previous CEC projects focused on Monarchs, most importantly, the North American Monarch Conservation Plan (CEC 2008). We will utilize both this plan and the accompanying *Monarch Monitoring Handbook* (CEC 2009). We will also collaborate with the Monarch Butterfly Flyway project, which is also part of the CEC 2015–2016 Operational Plan.

    - **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**

Our ultimate target audience includes farmers and other landowners and managers in agricultural areas. While the audience may be perceived as one that is less receptive to conservation measures focused on an insect, there is broad understanding of the importance of pollinators and, to a lesser extent, of the other ecosystem services that are provided by diverse native plantings. We will reach this audience by working with agencies and organizations that have strong relationships with this audience.

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- **The beneficiaries of capacity-building activities that the project may include**

Each of the target audiences above will benefit from the proposed work; habitat for Monarchs improves overall habitat for pollinators and other beneficial insects, improves water quality, and also provides beauty within the farm landscape.

- **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

For this project to be successful, many of the participants will also be stakeholders since any successful alliance requires participation of those with a direct interest in the success of the project. Stakeholders include farmers, ranchers, federal, state and provincial government agencies, and the conservation organizations listed above.

In the US, key NGO partners include The Xerces Society for Invertebrate Conservation, University of Iowa Tallgrass Prairie Center, and the University of Minnesota Monarch Lab, and federal partners include the USDA Natural Resource Conservation Service (NRCS) and Farm Service Agency, US Fish and Wildlife Service (FWS), and the US Forest Service. Other partners may include state departments of natural resources and county Conservation Districts, and many local and regional nonprofits. The current high level of interest in Monarch conservation in all three North American countries will provide a strong incentive for engagement.

In Canada, partner organizations may include provincial ministries of natural resources/environment (Ontario Ministry of Natural Resources and Forestry; *Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques*, in Quebec; *Ministère des Forêts, de la Faune et des Parcs*, in Quebec). Other partners may include agriculture nonprofit organizations such as: the Canadian Federation of Agriculture and the Canadian Forage and Grasslands Association, and NGOs with experience in Monarch education and outreach, such as the Montreal Insectarium, Nature Canada, the Canadian Wildlife Federation, and Pollinator Partnership Canada.

In Mexico, partner governmental organizations include: the Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (Sagarpa); the Advisory Body on Organic Agriculture; the National Institute for Research in Agriculture, Fisheries and Forestry; the National Commission for Knowledge and Use of Biodiversity (Conabio); the Federal Agency for Environmental Protection (Profepa); and the International Unit for International Affairs Coordination (UCAI-Semarnat). At the regional level, key state governmental partners include the governments of Tamaulipas, Coahuila, Nuevo León, Michoacán, San Luis Potosí, Querétaro, and Estado de México. Key NGO partners include *Grupo de los Cien*, World Wildlife Fund, WWF-Mexico, and The Nature Conservancy, and partners from universities may include *Instituto de Biología*, of the *Universidad Nacional Autónoma de México* (UNAM), and *Instituto Interamericano de Cooperación de la Agricultura*.

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Project 13: Monarch Butterfly Flyway: Communication, Participatory Conservation, and Education Programs throughout the Migratory Route	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$300,000 **Year 1: C$135,000** **Year 2: C$165,000**	

Strategic Priority / Subtheme

- Climate Change
- Green Growth
- Sustainable Communities and Ecosystems / Priority Species and Ecosystems; and Sustainable Communities / Urban Initiatives

The Monarch, symbol of the Commission for Environmental Cooperation, is renowned worldwide for its spectacular and unique migration across North America. However, habitat loss and degradation pose serious threats to migratory populations throughout their annual cycle (CEC 2008). In December 2013, the number of Monarch butterflies recorded in the wintering habitats in Mexico was the lowest ever documented since 1993. In response to this precipitous decline, the North American leaders agreed to establish, on 19 February 2014, a Trinational High Level Working Group for the Conservation of the Monarch Butterfly Migratory Phenomenon. In accordance with the 2008 North American Monarch Conservation Plan developed under the auspices of the CEC, key objectives for the Working Group include promoting social participation, outreach, and education in monarch conservation in the three countries.

Although the Monarch butterfly is the most well-known butterfly in North America, the complexity of its life cycle and landscape-scale habitat requirements and threats make conservation of the migratory phenomenon challenging. Therefore, Monarch conservation requires extended outreach and communication efforts. In particular, target audiences such as federal, state, provincial, and local authorities, industries, nongovernmental organizations, indigenous communities, as well as civil society in general, need to be better informed and sensitized to the large array of efforts that can be undertaken all across the Monarch's annual cycle to preserve the migratory phenomenon.

This project addresses the Sustainable Communities and Ecosystems strategic priority and all three subthemes of the priority (Priority Species and Ecosystems, Landscapes and Seascapes, Sustainable Communities and Urban Initiatives), as the Monarch is a priority species which travels across a large number of landscapes and depends on the preservation of fragile habitats that are also important resources for humans, who rely on them for their subsistence—crop fields, forest patches or wintering habitats.

How will this project address the cross-cutting themes?

- *Learning from and assisting vulnerable groups and indigenous communities*

Indigenous communities will play a crucial role in this project as the traditional ecological knowledge and customs related to the Monarch flyway will be gathered and synthesized. By emphasizing the importance of their natural and cultural heritage, the project seeks to increase indigenous communities' involvement in Monarch conservation efforts, as well as to raise awareness of the importance of preserving their ancestral traditions and increase interest in their Monarch-related products/handicrafts.

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- *Enhancing information-sharing, transparency, capacity building and communication*

The citizen-based and local communities' initiatives and education components of this project will encourage information-sharing and trilateral communication, as well as capacity building in educational programs.

Project Summary (including a clear statement of project goal)

The Monarch butterfly is facing serious challenges that need to be tackled simultaneously in Canada, Mexico and the United States. Outreach and awareness have been identified in the North American Monarch Action Plan (CEC 2008) as priority objectives to preserve the migratory phenomenon. Therefore, this project aims at leading the **development of a trilateral communication strategy**, as well as at **fostering citizen- and local community–based initiatives and educational programs** that will disperse information on the migratory phenomenon to all levels of society, and that will have positive impact on the preservation of important Monarch habitats.

Short-term Outcomes (at halfway point)

1. A trilateral communication strategy has been developed for the Trinational High Level Working Group for the Conservation of the Monarch Butterfly Migratory Phenomenon (TWG) that includes the following:
    a. a communication strategy that includes messages related to traditional ecological knowledge,
    b. clearly defined target audiences, and
    c. citizen- and local community–based initiatives.
2. Efforts to coordinate citizen- and local community–based initiatives have been supported.
3. Review of experiences and best practices has been conducted.

Long-term Outcomes (by the end of the project)

1. The migratory phenomenon of the Monarch butterfly is better known and understood by the public in general, and specific actions for its preservation better coordinated among target audiences, including local and federal authorities.
2. The best practices in creating and maintaining pollinator gardens are available to local communities and schools, as appropriate, along the migratory route.
3. Contributions of indigenous communities to the conservation of the Monarch butterfly have been gathered and synthesized.
4. Communication of experiences, mechanisms and educational programs to adapt to the different local and country needs have been shared.

Longer-term, Environmental Outcomes (post-project)

1. Citizens from the three countries value the importance of the migratory phenomenon and the role of Monarchs as a flagship species for insect conservation and migratory species.
2. Target audiences have modified their behavior/activity in order to preserve Monarch habitats and the migratory phenomenon.

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Performance Measures (quantified SMART measures)

Outcome	Measure	Target	Indicator
By 2017, a trilateral communication strategy has been developed among the three countries, including key messages relative to each country, indigenous knowledge, and trilateral priorities related to the conservation of the Monarch flyway	Communications strategy	Communications strategy produced	The communications strategy is made available to experts of the Trinational High Level Working Group for the Conservation of the Monarch Butterfly Migratory Phenomenon
By 2017, information gathered and synthesized from traditional ecological knowledge is available	Information gathered and synthesized	Integration of as much traditional ecological knowledge related to monarchs from as many indigenous communities across North America as possible and appropriate	Integration of traditional ecological knowledge into trilateral messages
By 2017, efforts to coordinate inventory and monitoring protocols have been undertaken	Assessment of protocols	100% of inventory and monitoring protocols have been assessed	Availability of assessment on the CEC's website
By 2017, best practices, novel approaches, and priorities for educational and awareness programs in the three countries have been compiled and are publicly available	Compilation of best practices, novel approaches, and education programs	100% of practices and programs compiled	Availability of practices and links to programs on CEC's website

Tasks necessary to reach the environmental outcome:

1) Trilateral communication strategy
2) Citizen- and local community–based initiatives
3) Trilateral education and awareness programs

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Task #1) Trilateral communication strategy

Subtask	**Project outputs**	**How does the subtask/output move the project toward the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Establish trilateral communication strategy, approved "political" messages; identify target audiences and specific representatives to contact in other sectors; align complementary activities with CEC "Engaging Farmers" project	Meeting with experts representatives of the High Level Working Group Communications strategy produced	Identify priority outreach and communication actions for the three countries and coordinate activities with other initiatives and revision of North American Monarch Conservation Plan	Year 1	Year 1: $25,000 Year 2: $0
1.2 Gather information and synthesize traditional ecological knowledge where possible	Information gathered and synthesized	Indigenous communities are directly and indirectly involved in conservation of the Monarch	Year 1	Year 1: $40,000 Year 2: $0
1.3 Dialogue with representatives from different sectors; identify gaps in communication and develop appropriate messages for target audiences, including indigenous leaders, as appropriate	Cross-sectorial workshop with representatives from target audiences (i.e., health, agriculture, transport) Specific messages developed	Project output aligned with CEC project "Engaging Farmers and Other Landowners to Support Monarch Butterfly and Pollinator Conservation" Target audiences are sensitized to requirements of the Monarch	Year 2	Year 1: $0 Year 2: $45,000

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Task #2) Coordination of citizen- and local community–based initiatives				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Identify partners and facilitate dialogue between partners in order to improve coordination of efforts, and create synergies, including in indigenous communities, as appropriate and as per task 1	In-person or webinar-based meeting with representatives from main organizations devoted to conservation of the Monarch	Citizen- and local community–based initiatives are promoted and their efforts coordinated	Year 1	Year 1: $45,000 Year 2: $0
2.2 Coordinate inventory and monitoring protocols across the three countries, building upon the efforts of the sister protected area network and MonarchNet	Assessment of protocols	Data collection along the migratory route is necessary to better understand the migratory phenomenon.	Year 2	Year 1: $0 Year 2: $45,000

Task #3) Trilateral education and awareness programs				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Identify best practices, novel approaches, and priorities for educational and awareness programs in the three countries	Meeting with experts of Monarch educational and awareness programs and pollinator gardens		Year 1	Year 1: $25,000 Year 2: $0
3.2 Set up a collaborative program between educational programs in all three countries	Exchange programs or create new activities	Communication of experiences, mechanisms and educational programs to	Year 2	Year 1: $0 Year 2 $75,000

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		adapt to the different local and country needs have been shared.		

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

This project addresses the Sustainable Communities and Ecosystems strategic priority and all three subthemes of the priority (Priority Species and Ecosystems, Landscapes and Seascapes, Sustainable Communities and Urban Initiatives) as the Monarch is a priority species which travels across a large number of landscapes and depends on the preservation of fragile habitats that are important resources for humans, who rely on them for their subsistence—crop fields, forest patches or wintering habitats.

Indigenous communities will play a crucial role in this project as the traditional ecological knowledge and customs related to the Monarch flyway will be gathered and synthesized. By emphasizing the importance of their natural and cultural heritage, the project seeks to increase indigenous communities' involvement in Monarch conservation efforts, as well as to raise awareness of the importance of preserving their ancestral traditions and increase interest in their Monarch-related products/handicrafts.

Lastly, the citizen- and local communities–based initiatives and education components of this project will encourage information-sharing and trilateral communication as well as capacity building in educational programs.

- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

The Monarch, symbol of the Commission for Environmental Cooperation, is renowned worldwide for its spectacular and unique flyway across North America. However, habitat loss and degradation pose serious threats to migratory populations throughout their annual cycle (CEC 2008). In December 2013, the number of Monarch butterflies recorded in the wintering habitats in Mexico was the lowest ever documented since 1993. In response to this precipitous decline, the North American leaders agreed to establish, on 19 February 2014, a Trinational High Level Working Group for the Conservation of the Monarch Butterfly Migratory Phenomenon. Based on the North American Monarch Conservation Plan issued by the CEC in 2008, key objectives for the Working Group include promoting social participation, outreach and education in the three countries.

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- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

All project tasks will be carried out from July 2015 to June 2017. The tasks will build on the strong continental partnerships established by the Trinational High Level Working Group for the Conservation of the Monarch Butterfly Migratory Phenomenon and will build on previous trilateral work to develop and share messages, protocols and educational programs.

Performance measures include the following:

- By 2017, a trilateral communication strategy has been developed in the three countries, including key messages relative to each country, indigenous knowledge and trilateral priorities related to the conservation of the Monarch flyway.
- By 2017, information gathered and synthesized from traditional ecological knowledge is available.
- By 2017, efforts to coordinate inventory and monitoring protocols have been undertaken.
- By 2017, best practices, novel approaches, and priorities for educational and awareness programs in the three countries have been compiled and are publicly available.

- **Where applicable, identify with reasonable specificity the following:**

  - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**

This project builds directly on previous CEC projects focused on monarchs, most importantly the North American Monarch Conservation Plan (CEC 2008). It will also collaborate with the "Engaging Farmers and Other Landowners to Support Monarch Butterfly and Pollinator Conservation" project, which is also part of the CEC 2015–2016 Operational Plan. The migratory phenomenon of the Monarch butterfly is better known and understood by the public in general, and specific actions for its preservation better coordinated by target audiences, including local and federal authorities.

  - **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

Stakeholders and key participants include federal, state and provincial government agencies, conservation organizations, academic institutions, educational institutions and, most importantly, indigenous and local communities. Examples of partners follow:

In the US, key NGO partners include The Xerces Society for Invertebrate Conservation, the University of Iowa Tallgrass Prairie Center, and the University of Minnesota Monarch Lab, and federal partners include the USDA Natural Resource Conservation Service and Farm Service Agency, the US Fish and Wildlife Service, and the US Forest Service. Other partners may include state departments of natural resources and county Conservation Districts, and many local and regional nonprofits. The high level of current interest in monarch conservation in all three North American countries will provide a strong incentive for engagement.

In Canada, partner organizations may include provincial departments of natural resources/environment (Ontario Ministry of Natural Resources and Forestry; *Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques*, in Quebec;

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Ministère des Forêts, de la Faune et des Parcs, in Quebec). Other partners may include agriculture nonprofit organizations such as: the Canadian Federation of Agriculture, and the Canadian Forage and Grasslands Association, and NGOs with experience in Monarch education and outreach, such as the Montreal Insectarium, Nature Canada, the Canadian Wildlife Federation, and Pollinator Partnership Canada.

In Mexico, partner governmental organizations may include The Ministry of Education (SEP), the National Commission for Knowledge and Use of Biodiversity (Conabio), the Federal Agency for Environmental Protection (Profepa), the National Forestry Commission (Conafor), and the International Unit for International Affairs Coordination (UCAI-Semarnat). At the regional level, key state governmental partners include the governments of Tamaulipas, Coahuila, Nuevo León, Michoacán, San Luis Potosí, Querétaro, and Estado de México.

Key NGOs partners include *Grupo de los Cien*, World Wildlife Fund, WWF-Mexico, The Nature Conservancy, and ProNatura (*Correo Real*), and partners from universities may include *Instituto de Biología* of the *Universidad Nacional Autónoma de México* (UNAM).

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Project 14: Local Environmental Observer Network	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$250,000 **Year 1: C$125,000** **Year 2: C$125,000**	

Strategic Priorities/Subtheme

- Sustainable Communities and Ecosystems
- Climate Change Mitigation and Adaptation

How will this project address the cross-cutting themes?

The LEO International Project will address the following CEC strategic priorities: Sustainable Communities and Ecosystems, and Climate Change Mitigation and Adaptation. These will be advanced by enhancing information-sharing and building capacity in indigenous communities to build a surveillance system involving traditional ecological knowledge (TEK) that serves to open a dialogue with governmental agencies and collaborate in addressing global climate change and its impacts on communities and ecosystems.

Project Summary (including a clear statement of project goal)

With the growing public health challenges involved in climate change and the environment, it is important that communities have the capacity to monitor, respond, and adapt to new impacts and health effects. Developing effective systems for accessing locally relevant information is part of the challenge. In addition, once such data are available, there are challenges in linking the observations made by indigenous communities to Western science and policy communities. To respond to this challenge, the United States began the Local Environmental Observer (LEO) Network, in Alaska, which is hosted by the Alaska Native Tribal Health Consortium (ANTHC) (www.anthc.org/chs/ces/climate/leo/). LEO is composed of local, indigenous experts who collect observations about unusual environmental events in their communities. This TEK content is uploaded to the LEO account and vetted by LEO content managers to confirm the observations and then posted on Google Maps. LEO managers and advisers can then link the observations and local community to the appropriate decision-makers and experts to help resolve issues identified. In addition, the aggregate data collected by LEO are a powerful repository of information on changes in the environment, an issue of particular concern in the face of a rapidly changing climate system.

The goal of this project is to introduce and expand the Local Environmental Observer (LEO) Network to Canada and Mexico. LEO proposes to focus on the geographic areas of the Yukon, the Northwest Territories, and/or British Columbia, in Canada, and in a designated area of Mexico to be identified by our trilateral partners. The project will assist partners with development and training of their own affiliated LEO Network chapters. It will also assist in identifying climate change–related impacts in the focus regions, along with enhancing dialogue about the value of local observations, the health and environmental effects of climate change, and strategies for mitigation and adaptation.

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Short-term Outputs (at halfway point)

The primary short-term output will be signature of an MOU(s) containing work programs, training plans, and outreach strategies to launch a new, pilot LEO chapter.

Long-term Outcomes (by the end of the project)

Improved access of TEK environmental observations that have been verified and can be used in Western decision-making and scientific processes; increased availability of technical assistance to indigenous communities to address environmental issues; improved mapping of environmental observations.

Longer-term, Environmental Outcome (post-project)

The launch of the LEO network in three countries will provide North American communities with tools and technology to improve monitoring of changes in the environment at the tribal community level as well as on a regional scale, by using an Internet-based system for posting observations. The observations are recorded and archived to provide a lasting record of verified conditions, creating a rich repository of information for both the local community and the overall scientific and policy community. In addition to documenting the impacts of change across North America, the network is also designed to improve communication and facilitate the connection between indigenous communities and scientific and policy organizations in order to provide technical assistance on how to address the environmental problems identified. The CEC LEO International project could serve as model for other regional/global networks via the Arctic Council, UN Environmental Programme (UNEP) or International Union for Conservation of Nature (IUCN), making the CEC a global leader on TEK.

Performance Measures (quantified SMART measures)

- Establishment of pilot North American LEO network comprised of one chapter in each the United States, Canada and Mexico, with soft launch by late 2016.
- Number of people trained to use LEO.
- Number of tribes and organizations trained to use LEO.
- Number of observations recorded each month between January and June 2017 and annually thereafter.
- Number of technical assistance engagements facilitated between January and June 2017 and annually thereafter.
- Number of decisions or reports that use LEO data in their policy or scientific process annually.

Tasks necessary to reach the environmental outcome

(Low-carbon-footprint approach. Focus on watershed communities and connection between watersheds and coastal areas.)

1) Identify appropriate indigenous groups and organizations to partner with in Canada and Mexico.

2) Develop and enhance LEO infrastructure.

3) Train regional partners on LEO processes.

4) Report results.

5) Continue to operate and improve LEO network in Alaska to maintain the US Arctic perspective and enhance the flow of information on new developments with North American partner networks.

Task #1) Identify appropriate indigenous groups and organizations to partner with in Canada and Mexico to establish new Network(s)

Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Outreach, consultations and network development	- List for potential LEO network members and partner organizations - Fact sheets and other materials to educate prospective members on LEO - Site visits, meetings and teleconferences to build support and identify network members - List of potential resources to support sustainable operations for new LEO networks - Refining topical areas of interest, based on local interest and available resources - Letter of intent, resolution or MOU and signing ceremony - Workplan on implementation phase of project	Identification of network participants and resource needs to establish the network for a new LEO chapter	Summer 2015 to Spring 2016	Year 1: $20,000 Year 2: $5,000

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Task #2) Develop and enhance LEO infrastructure				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Identify existing and build new LEO infrastructure	- Identification of regional technological needs; providing the required technology and training,(if needed); for the desired local observation results - Analysis of systems for LEO - Establish infrastructure required for new network(s) to begin recording observations	Provides mechanism inputting observations	Fall 2015–Spring 2016	Year 1: $20,000 Year 2: $35,000
Task #3) LEO training				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Launch of new LEO chapter(s) and regional consultations	- Training on LEO systems for: communication, social media; posting observations, photos and video; electronic surveys; quality control; permissions; intellectual knowledge; mapping; working with technical partners (local, regional, international);	Increases capacity of the partners to use LEO's tools and system, and formalizes the presence of LEO in Canada and Mexico	Mid 2016 - 2017	Year 1: $36,000 Year 2: $36,000

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	webinars/teleconferences; etc. - Regional introductory presentations to include maps, tools, and web presence			
3.2 Identify technical assistance and experts	- Contact list - Enrollment system - Outreach tool for sharing LEO posts - Venues for informing science, management systems, and policy (e.g., OneHealth groups)	Increases knowledge of LEO among external partners and linkages between LEO members and the scientific community	Early to mid-2016	Year 1: $2,000 Year 2: $2,000
3.3 Convene quarterly meetings (webinars) with Canada and Mexico partners to discuss network observations, challenges and progress; continue to develop international dialogue on LEO network	- Webinar meetings	Promotes use of LEO system by participants and validates their capacity to use it	2016–2017	Year 1: $2,000 Year 2: $2,000
Task #4) Report results				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
4.1 Report on environment, and findings assessments	- Report on observations of climate change that documents what is happening in the community and the watershed, with pictures and words (translated and provided to community)	Raises awareness about climate change events and existing knowledge among local people, regional providers,	Fall to Winter 2015	Year 1: $10,000 Year 2: $10,000

	- Findings for Mexico and Canada	and the CEC Allows a better understanding of how LEO is evolving in Mexico and Canada		
Task #5) Continue to operate and improve LEO Network in Alaska to maintain the Arctic US perspective and enhance the flow of information on new developments with North American partner networks				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
5.1 Apply and maintain LEO system to document environmental changes in Alaska and share knowledge regionally, nationally and internationally	- Maps (regional / international) - Webinars - Training - Consultation - E-News - Improved / updated educational tools	Contributes to improving LEO's program implementation and sustainability	2015-2017	Year 1: $35,000 Year 2: $35,000

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**
  By improving a model for engaging communities and connecting with technical experts and resources and informing about specific events and the impacts, needs, and responses required across three countries, LEO contributes directly to the achievement of CEC's strategic priority: Sustainable Communities and Ecosystems. More precisely, by improving monitoring of changes in the environment

and by connecting local environmental and health managers with agencies and organizations that can provide technical assistance and resources at the community level, LEO will contribute to the Priority Species and Ecosystems subtheme.

- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

  Many of the environmental problems we are facing nowadays and we will be facing in the future have considerable impacts and do not limit themselves to countries and their borders. By launching LEO in Canada and Mexico and connecting it to the network already existing in the US, this project will contribute to increasing communication and sharing of information between communities across North America. Furthermore, the new LEO Network will provide a model for engaging communities and connecting them with technical experts and resources not only at the community level but as well at the regional, national and international levels.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

  Multiple results are expected at the end of the project. The main ones are presented below:

  1. Presence of LEO programs in both Canada and Mexico

  LEO programs will have been developed and will be functional in both countries by the end of the project. Progress toward this result will be monitored based on the approved workplan to establish the programs.

  Performance indicator: Number of countries with LEO program in place

  2. Numbers of communities participating in a LEO program will have increased throughout North America

  The number of communities participating in a LEO program across North America will have increased. Progress toward this result will be monitored based on the number of formal agreements signed with communities including them in a LEO program.

  Performance indicator: Number of new communities joining the LEO program

  3. Number of LEO local observers will have increased across North America

  The number of LEO local observers trained across North America will have increased. Progress toward this result will be monitored based on the number of users of LEO system used to report observations.

  Performance indicators: Number of new users of the LEO system. Number of new observations collected

- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking this project, considering these points:**
  - The value added by doing it under the CEC cooperative program
  - Any other public, private or social organizations that work on such activities
  - Opportunities to cooperate and/or leverage resources with such organizations

As stated by CEC, "In North America, we share vital natural resources including air, oceans and rivers, mountains and forests. Together, these natural resources are the basis of a rich network of ecosystems which sustain our livelihoods and well-being."[19] LEO, by providing a model for engaging communities and connecting with technical experts and resources across North America, contributes to the protection of those ecosystems. LEO's expansion from the US to Canada and Mexico will allow increased exchange of information and further collaboration between the three countries and consequently will contribute to successfully protecting the North American environment. CEC, with its mission to facilitate governmental and public cooperation among Canada, US and Mexico to foster conservation, protection and enhancement of the environment, has already the structure and network in place to support the implementation of a project such as LEO and to facilitate coordination between the different countries. As an intergovernmental organization, and through its role in the implementation of the North American Agreement on Environmental Cooperation (NAAEC), the CEC also provides a vehicle to facilitate cooperation and leverage of funds with other organizations.

- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**
  The role of this project is limited to facilitating the expansion of the network to Canada and Mexico and strengthening in the United States. In the actual economic context, having a project in multiple countries represents an enormous challenge which can limit the implementation of a project such as the one proposed. The work proposed in this project will develop LEO resources in Canada and Mexico, concluding with the launch of new LEO chapters by the end of the CEC project. However, once national programs have been created, national organizations (governmental, nongovernmental or private) can take the lead in ensuring the further development and management of those LEO national programs. In Canada, for example, some organizations are already looking at options to secure funding to expand LEO in Canada.

- **Where applicable, identify with reasonable specificity the following:**
  - **Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication**

  In addition to linking to the Ecosystems Functions project currently under consideration by the CEC, the expansion of the LEO network across North America will contribute to the success of many past and future CEC projects. By providing a way to engage communities and connect them with technical experts and resources, LEO's collected observations provide a source of information useful in the monitoring of the environment that can be use by projects such as the ones funded under the CEC's Ecosystems or Climate Change stream.

  - **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**

  Many communities have already expressed interest in joining the LEO network. In Canada, for example, LEO is already present in some scattered communities in the Yukon, Northwest Territories, and British Columbia, demonstrating both the receptivity and the capacity of local community members to participate in such an initiative. In Mexico, one possible area for LEO expansion could be

[19] <www.cec.org/Page.asp?PageID=1246&SiteNodeID=1221&BL_ExpandID=879>

groups or communities residing in specific watersheds or coastal communities (or groups of communities) that have an interest in landscape or species conservation. This project will provide the stepping-stones for the expansion of this network in a more coordinated fashion across the NAFTA party countries.

- **The beneficiaries of capacity-building activities that the project may include**

Local community members will be the target audience for this project. Training and capacity-building activities will be carried out to provide the interested members with the required set of tools and knowledge to adequately document and share environmental changes happening in their community.

- **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

LEO Network's success is based on its capacity to engage communities and to connect them with technical experts and resources. The project will build LEO connections in Canada and Mexico and expand connections already existing with communities, academia, NGOs and industries to include new ones.

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Project 15: Using Ecosystem Function and Traditional Ecological Knowledge Together to Build Resilience and Adapt to Climate Change in North America	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$250,000 **Year 1: C$150,000** **Year 2: C$100,000**	

Strategic Priority/Subtheme:

- Sustainable Communities and Ecosystems / Priority Species and Ecosystems; and Sustainable Communities

This project addresses the Sustainable Communities and Ecosystems strategic priority and in particular the Priority Species and Ecosystems and Sustainable Communities subthemes. One of the many goals of indigenous communities' environmental and natural resource departments is to maintain and restore functionality of stream and wetland riparian and upland areas, which could protect these waterbodies' beneficial uses and values for indigenous communities. Traditional ecological knowledge (TEK) plays a significant role in indigenous communities' approach to natural resource management. One of the mainstays of indigenous communities' interactions with ecosystems is a deep and abiding view that humans are part of the environment. Conservation management by indigenous communities is guided by a respect for the relationships between species, their habitats, and fostering ecosystem resilience, which is critical to ensuring long-term sustainability.

Indigenous communities' environmental programs are leading the way in the paradigm shift towards sustaining natural resources (e.g., wildlife, aquatic habitat) while managing for water quality. Traditional ecological knowledge (TEK) provides the foundation for integrated riparian management focused on riparian and upland ecological function relationships. In Canada, the federal government has funded the development of tools to assist in managing future risks from a changing climate by using TEK and Western science to help forecast impacts and develop risk management options. In the US, the indigenous people and USEPA cooperative stream and wetland applied research program uses the proper functioning condition (PFC) protocol to assess ecological function condition. In Mexico, no federal-level program yet exists; however, there are several local and state initiatives underway. These approaches focus on identifying ecological functions at risk and enabling self-healing connections between ecosystems. Resiliency appropriate for the biogeoclimatic setting sustains an area over time. Restoring resiliency is part of a process dependent on knowledge from indigenous people (with TEK), interdisciplinary collaboration, and monitoring and analyzing key leading indicators (vegetation, hydrology, soil and landform) of ecosystem functions. Implementation of appropriate actions serves to sustain and enhance desired ecosystem services (e.g., fish habitat, livestock and/or wildlife forage, water purification, carbon storage and nutrient cycling) in disparate climatic conditions.

How will this project address the cross-cutting themes?

- *Learning from and assisting vulnerable groups and indigenous communities*

Sharing and applying knowledge and tools of ecological function will clarify the impact of current land management programs affecting riparian ecosystems and/or water catchments. This knowledge and these tools will offer alternatives to managing and enhancing the type, quality, and magnitude of ecological goods and services received. Developing land-management and risk management strategies is an interactive and engaging collaborative process. This process uses information from both Western science and traditional ecological knowledge to understand functions related to local site-specific potential. It begins by assessing the existing attributes of a site, to identify functions missing for each

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specific setting or how functions need to change, or how changing management can enable self-healing. Managers of land, water, ecosystems and infrastructures, and users of the ecological goods and services must collaborate to examine issues and problems via an integrated process.

- *Enhancing information-sharing, transparency, capacity building, and communication*

Terrestrial and aquatic ecosystems produce multiple goods and services. Ecosystem services take place on a spatial and temporal scale whose properties are inextricably linked with the quality of services provided. The vulnerability of an ecosystem to potentially degrading events has not, typically, influenced policy and management decisions because the protocol has been to rely on indicators to identify problems. This project provides tools and methodologies to measure and anticipate ecosystem vulnerabilities to climatic variability. It will also engage participants in discussions on various tools and approaches developed by the three countries to identify vulnerabilities and develop risk management strategies.

Project Summary (including a clear statement of project goal)

The goal of this project is to share tools to assess vulnerability that are available to indigenous communities in the three countries and to pilot new ones, and to demonstrate and test the concepts of integrated riparian and/or water catchment management. Specifically, the project will:

- share vulnerability assessment and management tools that have been developed specifically for indigenous communities;
- demonstrate different tools, including the Riparian Proper Functioning Condition Assessment and Integrated Riparian Management tool, to multiple indigenous leaders and representatives;
- work with indigenous communities, local managers, and stakeholders in Canada and Mexico and, at one study area in each country, demonstrate these concepts and apply them to the local watersheds and management situations;
- derive lessons from the collective experiences, including the identification of key leading performance indicators for the sustainability of an ecosystem and effectiveness of best management practices (BMPs), and correlate alterations in ecosystem functions and water quality with changes in land-use practices;
- evaluate the indicators against historic trends in the designated Mexico and Canada study areas;
- analyze three key metrics—a) vegetation diversity, type and location, b) landform and channel pattern, profile and dimension, and c) water quality related to hydrology—as influenced by land use, restoration, and management, in the two study areas;
- develop trilateral capacity to share tools and experiences; and
- develop an ecological monitoring program as part of an adaptive management plan/strategy that assists in reducing uncertainty from climatic variability.

The best environmental sustainability management decisions are made when communities are given easy-to-use decision support tools and meaningful data. The sharing of tools to assess vulnerability and demonstrate and test the concepts of integrated riparian and/or water catchment management, highlights the benefits of multiple approaches to environmental protection, capitalizes on synergies derived from protecting human and ecosystem health, and reduces the likelihood that policy decisions will have unintended negative consequences. Indigenous communities need to make strategic decisions. It is important to have knowledge, timely data, and cost-effective decision support

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tools within reach to meet objectives and goals.

Functional ecosystems are resilient to disturbances, in contrast to non-functional ecosystems, which fail to adequately process surges in water flow from upland and upstream inputs. Also, ecosystem degradation affects human health and safety, which requires communities to respond and implement adaptive measures. Understanding how ecosystems work and the goods and services they provide will assist decision-makers in identifying the connections between form, function, management, and monitoring. This will allow decision-makers to better address the underlying causative factors behind ecological degradation. Improved knowledge of aquatic and upland interactions, at local to watershed scales, is essential to evaluating and designing land management alternatives for stream and wetland resources.

Short-term Outcomes (at halfway point)

1. Awareness created about functionality and vulnerability assessment concepts and their utility in focusing management and monitoring; as well as exchange of technical information and local knowledge through the coordination of workshops on these concepts in the US, Mexico and Canada.
2. Experts and local stakeholders share and gain knowledge at workshops in selected study areas in Mexico and Canada, about water management tools used at the community level in the three countries.

Long-term Outcomes (by the end of the project)

1. Assessment of risks and opportunities in designated Mexican and Canadian study areas, using traditional ecological knowledge and other information to understand functions related to potential ecological condition throughout a water catchment; and assessment of vulnerabilities of communities to projected climate change.
2. Case study reports, assessments, and study-area adaptive management plans, including monitoring indicators.

Longer-term, Environmental Outcomes (post-project)

The people and agencies engaged in this project will gain experience from hands-on application of vulnerability assessment/management and ecosystem function management concepts. This will enable them to expand this application to provide support to other indigenous and non-indigenous water catchments and riparian areas in need. They will also gain a better understanding of what tools are being used for water management at the community level in Canada, Mexico and the US and how to identify potential uses in their respective countries.

Dissemination of research results will include:

1. convening international meetings and trainings with internal and external stakeholders,
2. developing a quality assurance project plan (QAPP) for all data collected, and
3. producing quarterly and final reports, which will lead to publications in peer-reviewed journals.

Performance Measures (quantified SMART measures)

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Outcome	Measure	Target	Indicator
Awareness created about functionality and vulnerability assessment concepts and their utility in focusing management and monitoring; as well as exchange of technical information and local knowledge through the coordination of workshops on these concepts in the US, Mexico and Canada.	Number of participants at workshops on vulnerability assessment/management and ecosystem function. Before-and-after surveys of participants on level of knowledge of functionality concepts.	3 workshops, with indigenous community representation at each. 100% of workshop participants indicate increased level of knowledge of vulnerability assessment/management and functionality concepts.	Increase in number of workshops held on vulnerability assessment/management and functionality concepts in North America. Increase in the level of knowledge of these concepts in the three countries.
Experts and local stakeholders share and gain knowledge at workshops in selected study areas in Mexico and Canada about water management tools used at the community level in the three countries.	One study area selected each for Canada and Mexico. Number of participants at workshops and participating in CEC work, by area of expertise and organization/indigenous/agency collaboration within each country.	75% of stakeholders identified by Canada and Mexico participate in the workshops.	Increase in the number of study areas in Canada and Mexico focused on community-level water management tools, and in the number and variety of stakeholders engaged in this work.
Assessment of risks and opportunities in designated Mexican and Canadian study areas, using traditional ecological knowledge and other information to understand functions related to potential ecological condition throughout a water catchment; and assessment of vulnerabilities of communities to projected climate change.	Development of new and/or improved information on risks and the opportunities to improve ecological condition and increase community resiliency in selected Mexico and Canada study areas, using TEK and other information.	Appropriate information developed for each study area on risks and opportunities, using TEK and other information.	Increase in the amount and availability of information in the three countries.
Case study reports, assessments, and study-area adaptive management plans, including monitoring indicators.	Publication of case study reports, assessments and management plans.	100% completion and dissemination of case studies, assessments and management plans.	Increase in the availability of publications on the integration of TEK and Western science related to functionality and

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			vulnerability assessment for riparian management in North America.

Tasks necessary to reach the environmental outcome

1) Coordinate knowledge sharing/transfer and prioritize management actions
2) Implement ecosystem management practices and assessments and develop monitoring activities
3) Produce reports of study area assessments, and study-area adaptive management plans, which include monitoring indicators

Task #1) Coordinate knowledge sharing/transfer and prioritize management actions

Subtask	**Project outputs**	**How does the subtask/output move the project toward the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Coordination workshop with managers, scientists and other stakeholders to plan and select tools for vulnerability assessment/management and ecosystem function	Workshop with managers, scientists and other stakeholders to share lessons learned on vulnerability assessment tools and ecosystem function, data needs, and adaptive management planning process, and to identify management priorities and near-term actions.	The group will identify successful strategic actions to conserve and restore ecosystem processes and ecosystem services (e.g., native species), and to support local communities in adapting to potential climate-change effects. Identification of TEK management methods in stream and wetland habitats.	Summer 2015	Year 1: $45,000 Year 2: $0
1.2 Translation of documents	Translation of documents for initial train-the-trainers document		Fall 2015	Year 1: $5,000 Year 2: $0

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Task #2) Implement ecosystem management practices and assessments and develop monitoring activities				
Subtask	**Project outputs**	**How does the subtask/output move the project toward the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1 Study-site visits and on-site ecosystem function workshops with local stakeholders, including a field assessment and education and outreach activities with private landowners, managers, park visitors, and other stakeholders. The workshops will include exchanges on climate-change adaptive management planning, and ecosystem functionality assessments, will identify study sites in Mexico and Canada, and will create a work and quality assurance project plan.	Workshop reports and assessments from study sites, including recommended conservation actions and monitoring on public and private lands to improve landscape and community resilience. Comparison of management alternatives using TEK, and current and future climate change scenarios. Development of quantitative indicators of stream and wetland riparian vegetation and of stream channels. Initiate work on climate-change adaptive management planning in the Mexico and Canada study areas.	Ecosystem management practices will help to maintain or restore the ecological functions, connectivity, and resilience to climate change. Participation by and engagement with communities, visitors and other stakeholders will help to build support for protection implementing an adaptive management plan and monitoring, to increase the long-term sustainability of project outcomes. Study areas will provide a case study for collaborative efforts to develop conservation targets and increase sustainable ecosystem services.	Fall 2015–Spring 2016 Summer 2016–Spring 2017	Year 1: $100,000 Year 2: $80,000

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Task #3) Reports of study area assessments, study-area adaptive management plans, which include monitoring indicators				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Dissemination of case studies reports developed for study areas, including study-area adaptive management plans and monitoring indicators	Reports, journal articles, and information dissemination on website	Scientific validation of TEK management plans	Spring 2017	Year 1: $0 Year 2: $20,000

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

- **How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?**

  The best environmental sustainability management decisions are made when communities are given easy-to-use decision support tools and meaningful data. The sharing of tools to assess vulnerability, and to demonstrate and test the concepts of integrated riparian and/or water catchment management, highlights the benefits of multiple approaches to environmental protection, capitalizes on synergies derived from protecting human and ecosystem health, and reduces the likelihood that policy decisions will have unintended negative consequences. Indigenous communities need to make strategic decisions. It is important to have knowledge, timely data, and cost-effective decision support tools within reach to meet objectives and goals.

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- **Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)**

  Assessment of vulnerability and riparian functions provides North American decision-makers with the connections between form, function, management, and monitoring, which will allow them to better address the underlying causative factors behind ecosystem degradation and restoration. In most streams, loss of riparian functions causes a significant portion of non-point-source pollution. The loss of riparian function and physical form unravels the assimilation processes. With the loss of ecological functions, stream and wetlands riparian areas are no longer able to dissipate energy, sequester pollutants, facilitate sediment deposition, and take up nutrients through plant growth. Instead, pollution can wash into water bodies from wherever it had been and/or would have been stored. In non-functional stream and wetland riparian areas the aquatic environment itself becomes a source of water pollution. Managing for water quality must focus on the drivers of physical functions (vegetation, hydrology, soil and landform). These early indicators will provide data to managers, of the type of interventions needed to prevent the loss of assimilative processes and prevent the progression of water quality deterioration such as found in many communities in Canada, Mexico and the US. In areas with high dependence on riparian functions for water quality, assessing ecological function using proper functioning condition (PFC) protocols has the potential to be more effective than chemical/biological sampling.

  Local qualitative assessments of stream function and biophysical alterations, when incorporated with quantitative in-stream monitoring, empower resource managers to evaluate adaptive management alternatives, prioritize resource allocations, and identify indicators to be monitored. By focusing on stream and wetland riparian functions, a long-term sustainable restoration of the water body, with greater resiliency and assimilative capacity, can be realized.

  Furthermore, the discussion around the different tools used for community-level vulnerability assessment and management in the three countries will contribute to a better understanding of what is currently being used in this sector and could be used or adapted to other communities within each country.

- **What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.**

Through this project, awareness will be created within communities in the three countries about functionality and vulnerability assessment concepts and their utility in focusing management and in monitoring, and as well there will be an exchange of technical information and local knowledge through the coordination of workshops on these concepts, in the US, Mexico and Canada. The knowledge gained by participants at these workshops will be measured through pre- and post-workshop surveys. Target: 100% of participants report increased knowledge after the workshop.

At the Mexican and Canadian study area workshops and field assessments, experts and local stakeholders will share and gain knowledge about water management tools used at the community level in the three countries. The number and variety of stakeholders participating in

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these study area workshops will determine the knowledge transfer potential of these activities. Target: 75% of stakeholders identified by Canada and Mexico participate in the workshops.

The study area risk/opportunity assessments using traditional ecological knowledge and other information will support the ability of communities to make strategic resource management decisions, through better understanding of the functions related to potential ecological condition throughout a water catchment, and of the vulnerabilities of communities to projected climate change. This work will be measured through the successful completion of the assessments. Target: Appropriate information developed for each study area on risks and opportunities, using TEK and other information.

By the end of this project, case study reports, assessments and study-area adaptive management plans, including monitoring indicators, will be completed and available for use by other communities across North America. Target: 100% completion and dissemination of case studies, assessments and management plans.

- **Explain why the CEC is the most effective vehicle for the Parties to use in undertaking this project, considering these points:**

  This project directly responds to the CEC's strategic priority on Sustainable Communities and Ecosystems and builds international collaboration. It is consistent with the CEC's approach of using science to increase ecosystem resilience. This project focuses on improving ecological functions, to create an adaptive management planning process for the sustainability of essential and culturally sensitive ecosystems. In line with the CEC's cross-cutting theme to learn from and assist vulnerable and indigenous communities, the project uses Western science and TEK to strengthen institutional and individual stewardship.

  - **Any other public, private or social organizations that work on such activities**

    In the US, the Department of the Interior (DoI), Bureau of Land Management (BLM) and National Riparian Service Team (NRST) have been instrumental in developing the ecosystem protocol and use for managing public lands.

    Canada has developed tools to assess community vulnerabilities to projected climate change and to do community adaptive management planning.

    In Mexico, the National Commission for the Development of Indigenous Communities (*Comisión Nacional para el Desarrollo de los Pueblos Indígenas*—CDI) is in charge of coordinating actions and/or resources with federal, state and municipal institutions, as well as with social and private organizations, to promote sustainable development, recognition of cultural heritage, intercultural relations, and rights of indigenous people and communities. Within the Ministry of Environment and Natural Resources, two organizations are involved in work related to this project: the National Commission for Knowledge and Use of Biodiversity (*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*—Conabio) and the National Commission for Natural Protected Areas (*Comisión Nacional de Áreas Naturales Protegidas*—Conanp).

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- **Opportunities to cooperate and/or leverage resources with such organizations**

This project will use protocols developed by BLM. Coordination with DoI and the Department of Agriculture (DoA), US Forest Service (USFS) and Natural Resources Conservation Service (NRCS) is dependent on the location of the designated study areas in Mexico and Canada and on common goals.

Conabio has identified Priority Regions for Conservation, among which 70% are located within indigenous territories. Conanp has a specific division in charge of indigenous communities living in protected areas, as almost 30% of the total surface of protected areas is owned by indigenous groups. It is estimated that indigenous lands are among the best preserved natural ecosystems but also harbor the most marginalized communities. Conanp is currently implementing several programs related to this project: subsidies programs to promote participation of indigenous communities in conservation actions; certifications program for areas voluntarily devoted to biodiversity conservation; and programs for the development of indigenous communities, which include capacity-building, social assessments, and inclusion of indigenous people into protected areas' councils. Lastly, a new project is being implemented in collaboration with Conabio and CDI, aiming to promote the fair and equitable sharing of benefits arising from natural resources (Nagoya Protocol). Additionally, Conanp is currently leading the implementation of a Global Environment Facility (GEF) project named Resilience (Strengthening Management Effectiveness and Resilience of Protected Areas to Safeguard Biodiversity Threatened by Climate Change). This project involves 17 protected areas in Mexico and could link with the present project, providing technical assistance in issues related to climate change, as well as providing some funding, as long as the pilot site in Mexico coincides with one of the protected areas.

- **Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.**

The current project is a 2-year project that will pilot new tools in two study areas in North America. The work will involve three phases: an initial planning and knowledge-sharing phase (first workshop); a subsequent phase involving study area workshops, on-site field assessments, and management plans development (study area workshops); and a final information dissemination phase. It is hoped that through this final phase the tools, protocols and management strategies developed through this project will continue to be used and adapted by other communities in the three countries after the life of the project.

- **Where applicable, identify with reasonable specificity:**

  - **The target audience, as well as its receptivity and capacity to use the information that may be produced as a result of the project**

Primary target audiences are indigenous communities across North America, and private landowners. In addition, cities, states and federal land management agencies have benefitted from ecosystem function research. Ecosystem function research is designed to build capacity within the participating indigenous community and or agency. This research integrates traditional environmental

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knowledge (TEK) with ecosystem function and ecological and environmental risk science. Indigenous environmental planning efforts will serve to help people:

- become familiar with assessing functional condition of ecosystems;
- learn about fate and transport of contaminants;
- hone information access skills, which can be used to achieve adaptive management goals;
- work with a case study to gain practical experience; and
- be introduced to vulnerability assessment, riparian proper functioning condition, and integrated riparian management.

- **The beneficiaries of capacity building activities that the project may include**

Indigenous communities have been accumulating traditional ecological knowledge (TEK) for millennia. TEK plays a significant role in an indigenous community's approach to natural resource management. Indigenous conservation management is guided by a respect for the relationships between species, their habitats, and fostering ecosystem resilience, which is critical to ensuring long-term sustainability.

Ecosystem function research is designed to provide transferable applied research in stream and wetland ecological processes. Knowledge of ecological functions allows a manager to see how an indigenous community's cultural practices can be affected by the way an ecosystem absorbs and releases water, nutrients, and toxins. Such knowledge includes:

- relationships among water, vegetation, and landform;
- nutrient and trace-metal solubility;
- fate and transport of sediment, nutrients, and trace metals (e.g., mercury);
- phyto-detoxification;
- aquatic benthic macro-invertebrate criteria; and
- how to incorporate TEK into environmental and ecological risk assessment.

- **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

  - Karen Richardson, CEC, Secretariat
  - Daniel Heggem, USEPA ORD NERL Environmental Sciences Division, Las Vegas, NV
  - Marie-Eve Neron, Climate Change Programs, Aboriginal Affairs and Northern Development Canada
  - Yves Theriault, Climate Change Programs, Aboriginal Affairs and Northern Development Canada
  - Ivy Chan, Environmental Public Health, First Nations and Inuit Health Branch, Health Canada
  - Robert K. Hall, USEPA Region, San Francisco, CA

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- Sherman Swanson, Department of Natural Resources and Environmental Science, College of Agriculture, University of Nevada, Reno
- John Lin, USEPA ORD NERL ESD Landscape Ecology Branch, Las Vegas, NV
- Daniel Mosley, Contractor, Walker River Paiute Tribe, Fernley, NV
- Elizabeth (Betsy) R. Smith, USEPA ORD, Sustainable and Healthy Communities Research Program
- Mariana Bellot Rojas, General Director for Institutional Development and Promotion, National Commission for Protected Natural Areas (*Comisión Nacional de Áreas Naturales Protegidas*—Conanp), Mexico
- Sergio Sánchez López, Division of Wetlands and Costal Areas Affairs, Conanp
- Laura Martinez Pepin, Division of International Cooperation, Conanp
- Noé J. Navarrete Zamora, Division of Indigenous Communities in Protected Areas, Conanp
- Miguel Juárez Flores, Division of Indigenous Communities in Protected Areas, Conanp
- Martín Cadena Salgado, Coordinator of the GEF Resilience project, Division of Strategies for Climate Change, Conanp
- National Commission for the Development of Indigenous People (*Comisión Nacional para el Desarrollo de los Pueblos Indígenas*—CDI), Mexico
- Lucila Neyra, Coordination of Biological and Genetic Resources, National Commission for the Knowledge and Use of Biodiversity (*Coordinación de Recursos Biológicos y Genéticos, Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*—Conabio), Mexico

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Project 16: Marine Protected Areas: Strengthening Management Effectiveness and Supporting Coastal Community Resilience	**Operating Year(s): 2015–2016**
Planned Budget for two years: C$300,000 **Year 1: C$140,000** **Year 2: C$160,000**	

Strategic Priority/Subtheme

- Sustainable Communities and Ecosystems / Landscapes and Seascapes; and Priority Species and Ecosystems
- Climate Change Mitigation and Adaptation / Blue Carbon (Marine and Coastal Ecosystems)

This project addresses the Sustainable Communities and Ecosystems strategic priority and in particular, the Landscapes and Seascapes subtheme. It also has several components that address the Priority Species and Ecosystems subtheme, the Climate Change Mitigation and Adaptation strategic priority and Blue Carbon (Marine and Coastal Ecosystems) subtheme. The project aims to support marine protected area networks, seascape-level Marine Park Partnerships, climate-smart adaptation and mitigation activities, and the integration of traditional knowledge and community-level awareness and engagement. It will work with the private sector as well as with indigenous and local communities to better understand and ameliorate the ecological, social, cultural, and economic vulnerability of fisheries, traditional and nature-based activities within North American seascapes. It also addresses issues and opportunities raised at JPAC's November 2014 meeting on North America's Coasts in a Changing Climate.

How will this project address the cross-cutting themes?

Learning from and assisting vulnerable groups and indigenous communities

This project builds on previous initiatives to improve connectivity of priority ecosystems in North America through the establishment of Marine Protected Area networks. Focusing primarily on sustainable communities, it also builds on other CEC work aimed at identifying and mapping blue carbon habitats in a changing climate. In addition, this project will apply CEC and national guidelines at the seascape level to assist vulnerable and indigenous coastal communities in preserving essential economic, social, and cultural benefits.

Enhancing information sharing, transparency, capacity building and communication

The project will promote information sharing, communication, and capacity building on themes of common interest. The project also aims to support ongoing initiatives on climate change adaptation and mitigation as well as on community-level awareness, engagement and capacity in working collaboratively with marine protected area managers in conserving marine ecosystems and traditional sustainable livelihoods.

Project Summary (including a clear statement of project goal)

The project will develop a North American approach to marine protected area (MPA) management effectiveness and coastal community resilience, building on existing efforts within the three countries and taking into account climate and other related pressures and their impacts on species, ecosystems, and people. This conservation approach recognizes the critical role that MPAs can play in helping to sustain the

benefits that these special places provide to local economies and communities, while recognizing the critical role of sustainable economic activities in helping to maintain and restore species and ecosystems.

This project responds to existing national and international commitments to enhance management effectiveness in MPAs through the development of a new Marine Park Partnership, which will target pilot clusters of MPAs in priority shared seascapes (e.g., Gulf of Mexico, Arctic, Salish Sea, Gulf of California). The main objective of these partnerships will be to work collaboratively to tackle threats affecting shared resources and ecosystems. Marine protected area managers of pilot MPAs will apply existing CEC, national climate-smart and other MPA management guidelines to identify local economic activities that are potentially threatened by climate change and other impacts to the MPA, with a primary focus on one or several of the following: commercial/recreational fishing, nature-based recreation, and traditional use by indigenous communities (including eco-cultural restoration). In collaboration with community partners, the project will promote new cross-sectorial partnerships while nurturing the integration of project outcomes into the management plans and activities of the pilot marine protected areas. The project is intended to be flexible and scalable to address the varying levels of management capacity necessary to address these challenges within different MPAs.

Key elements of the project will include sharing information on how MPAs can be managed more effectively, assessing impacts and vulnerabilities at the seascape and local levels, redefining conservation goals and objectives under changing climate scenarios, improving MPA management plans, recognizing the role of sustainable local economic activities in the conservation of species and ecosystems, and identifying potential policy changes, including planning for new MPAs. By improving climate-smart seascape planning, the project will improve our understanding of how current threats impact migration patterns and ecosystem processes at three different levels: system (across the North American MPA network), seascape (regional clusters), and on-site (local). As Canada, Mexico and the United States connect and expand MPA networks by fostering Marine Park Partnerships, this project can serve as a model for broader implementation of partnerships to enhance conservation at the seascape level and adapt management plans to improve effectiveness. At the same time, the project will improve communities' livelihoods by identifying the most important traditional, fisheries, and nature-based activities linked to MPA resources and by working with communities and the private sector to adaptively manage these activities to address persisting and emerging threats. These actions are critical if we are to conserve the ability of existing and planned protected areas to provide essential ecosystem services that support human life and livelihoods.

Short-term Outcomes (at halfway point)

1. Cooperation among MPA managers within the framework of Marine Park Partnerships
2. Identification of common threats at seascape and local levels of their impact on resources
3. Identification of sustainable economic activities at each pilot site that have a positive impact on MPA conservation
4. Identification of and contact made with community partners in pilot sites
5. Promotion of effectiveness measures through climate-smart approaches that take into account the needs of local economies and interactions between indigenous communities, coastal resources, and eco-cultural restoration (both for social and ecological value)
6. Promotion of sustainable fishing, traditional, and nature-based activities through North American cross-sectorial partnerships

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Long-term Outcomes (by the end of the project)

1. Partnerships at the seascape level that successfully contribute to increased connectivity and improved eco-social resilience
2. Sharing of experiences and knowledge by MPA managers and coordination of seascape-level activities within the framework of Marine Park Partnerships
3. Better acknowledgment and consideration of an array of economically sustainable activities with positive impacts on ecosystem conservation when formulating MPA management plans.

Longer-term Environmental Outcome (post-project)

- Significant expansion of North America's MPA system to key areas in order to increase coastal ecosystem and community resilience
- Increase in coastal ecosystem and community resilience as a result of climate smart practices in MPAs
- Improved local resource-based economies due to social resilience in coastal communities
- Incorporation of traditional indigenous resource practices into MPA management and resilience thinking

Performance Measures (quantified SMART measures)

Outcome	Measure	Target	Indicator
By 2017, MPA managers in at least two selected seascapes have implemented collaborative activities within in the framework of Marine Park Partnerships.	Creation of partnerships based on MPAs that work to address problems at the seascape-level – these can range from informal to formal partnerships depending on the needs of the MPA programs.	2 Marine Park Partnerships established	Memorandums of understanding between the Marine Parks signed (where appropriate)
By 2017, resource vulnerabilities and potential adaptation actions have been identified using climate-smart guidelines for MPA managers in pilot sites, with a primary focus on fisheries, nature-based recreation, and traditional activities.	Completion of pilot vulnerability assessment of MPAs, including assessment of sensitivity, exposure, and adaptive capacity	Assessment completed for 2 seascapes	Assessment available to MPA experts
By 2017, sustainable economic activities related to fisheries, traditional indigenous resource use,	Analysis of factors determining the vulnerability of these	Analysis completed for 2 seascapes	Analysis available to MPA experts, managers and major stakeholders

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and nature-based recreation have been identified, and potential vulnerabilities and adaptation actions have been identified.	activities to potential climate change impacts, sustainability, and potential positive and negative impacts on conservation		
By 2017, at least three workshops have been organized in the pilot seascapes, with participation from key community members, indigenous community leaders, and local businesses.	Participation of key stakeholders and MPA experts and managers in trinational and seascape-level workshops	Three workshops completed	Minutes from workshops available to participants
By 2017, development of recommended management actions for MPAs in the two seascapes have been identified for consideration in future MPA management plan and operational plan updates.	Guidelines, including maps of blue carbon habitats and North American MPAs, highlighting potential opportunities and priorities for network expansion	Guidelines completed and disseminated	Availability of guidelines and maps

Tasks necessary to reach the environmental outcome:

1) Establish Marine Park Partnerships.
2) Apply CEC, national climate-smart and other MPA management guidelines in MPA pilot sites.
3) Identify options to support and enhance sustainable economic activities to improve local and indigenous community livelihoods at the site and/or seascape level.

Task #1) Establish Marine Park Partnerships at the seascape level to address management challenges and enhance network resilience and connectivity (e.g., Gulf of Mexico, Arctic, Salish Sea, Gulf of California)

Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
1.1 Hold workshops to exchange experiences and	Creation of partnerships based on MPAs that work to address	Working within partnerships at the	Year 1	Year 1: $50,000

knowledge, identify common interests, and understand unique circumstances (one workshop for each seascape identified)	problems at the seascape level Identification of a short list of threats, impacts and opportunities to inform Tasks #2 and #3.	seascape level will help increase connectivity and improve eco-social resilience, as well as heighten impacts of system-level activities, while taking into account site-level specificities.		Year 2: $0
1.2 Identify legal and technical conditions for the formal establishment of Marine Park Partnerships.	Completion of a legal and technical assessment and roadmap to facilitate high level agreements with a view to establishing memoranda of understanding	This guideline will help sustain this activity beyond the project period.	Year 1	Year 1:$10,000 Year 2:$0
Task #2) With a primary focus on specified activities and within specific seascapes, apply CEC, national climate-smart and other guidelines to identify common threats that affect resources, local economic activities, and traditional activities potentially threatened by climate change and other impacts to MPAs				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
2.1. Apply CEC, national climate-smart and other guidelines in MPA pilot sites, with a focus on fisheries, traditional, and nature-based activities in two seascapes.	Completion of pilot vulnerability assessment of MPAs, including assessment of sensitivity, exposure, and adaptive capacity	Understanding the vulnerability of MPAs and identification of potential adaptive actions will help address threats to marine species and ecosystems.	Year 1	Year 1: $80,000 Year 2: $0
2.2. Identify opportunities for potential expansion of MPA networks at the North American scale based on	Map of blue carbon habitats and North American MPAs, highlighting potential opportunities and priorities for	It informs the future expansion of MPA networks in the three countries, based on	Year 1	Year 1: $0 Year 2: $5,000

analysis of spatial protection of blue carbon habitats.	network expansion based on blue carbon conservation as a co-benefit.	opportunities for additional protection of blue carbon habitats (with benefits for carbon storage, disaster resilience, and species conservation).		
Task #3) Enhance the management of important fisheries, traditional, and nature-based activities linked to MPA resources, working with communities and the private sector to address persisting and emerging threats.				
Subtask	**Project outputs**	**How does the subtask/output move the project towards the environmental outcome**	**Timing**	**Budget (C$)** (activities)
3.1 Compile and analyze ecological, social, cultural, and economic vulnerability of fishing, traditional, and nature-based activities in pilot sites and seascapes, along with potential adaptive actions to minimize negative impacts.	Identification of fisheries, traditional, and recreational activities at pilot MPAs and seascapes Analysis of factors determining the vulnerability of fisheries, traditional, and recreational activities to potential climate change impacts; sustainability; and potential positive and negative impacts on conservation	This will assist in understanding the vulnerability of strategic economic activities and their direct and indirect impact on conservation activities.	Year 2	Year 1: $0 Year 2: $80,000
3.2. Hold a workshop within each seascape with MPA managers, local communities, and private-sector partners.	Inclusion of cross-sectorial activities into management plans Presentation of information on economic and social vulnerabilities and potential adaptation options and	This will promote sustainable development and/or management of economic activities that benefit marine conservation.	Year 2	Year 1: $0 Year 2: $60,000

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	development of priorities and strategic approach	This will foster effective collaboration with local communities and ensure the long-term viability of sustainable activities.		
3.3. Develop outreach materials to highlight lessons learned and opportunities for MPA adaptation, to enhance effectiveness, and to expand the network.	Outreach materials highlighting project lessons learned Outreach materials for each seascape targeting community, private-sector partners and the public Maps and accompanying analysis on the overlap of key blue carbon areas with areas of ecological, cultural and economic significance to highlight opportunities for additional protection of blue carbon habitats through expanded MPA networks	These materials serve to share key findings of the project with other MPAs and partners, helping to build understanding and support for future implementation in order to enhance coastal resilience.	Year 2	Year 1: $0 Year 2: $15,000

Explain how this project meets the selection criteria adopted by Council in the Strategic Plan (see below)

The goal of all projects funded by the CEC will be to support the efforts of the Parties to conserve, protect and/or enhance the North American environment. The following criteria will guide the Secretariat, Working Groups, Committees, and other appropriate officials of the Parties in considering cooperative activities for Council approval under operational plans. These selection criteria do not apply for activities to be funded through the NAPECA grant program.

How does the project contribute to achieving Council's strategic objectives as described within the current Strategic Plan, or as related to other priorities subsequently confirmed by Council?

This project addresses the Council's Sustainable Communities and Ecosystems strategic priority and, in particular, the Landscapes and Seascapes subtheme. It also has several components that address the Priority Species and Ecosystems subtheme, the Climate Change

Mitigation and Adaptation strategic priority, and the Blue Carbon (Marine and Coastal Ecosystems) subtheme. The project aims to support MPA networks, seascape-level Marine Park Partnerships, climate-smart adaptation and mitigation activities in marine ecosystems, integration of traditional knowledge, and community-level awareness and engagement. This project responds to existing formal national and international commitments, including the Convention of Biological Diversity's Aichi Targets 1, 11, and 15 and the White House Priority Agenda for Enhancing the Climate Resilience of America's Natural Resources to promote awareness of the values of biodiversity, integration of marine and coastal environments, and enhancement of ecosystem resilience and carbon stocks. It builds on precious worked supported by the CEC (2011–2012) to design resilient marine protected area networks in a changing climate and more recent work (2013–2014) to integrate blue carbon assessments into North America's carbon budgets.

Are the proposed objectives North American in scope? In other words, how are the proposed results relevant to protecting the environment in North America? (For example, what would Council members announce to the press at the successful completion of this project?)

At the project's conclusion, Council members will be able to announce new tools and partnerships, including climate-smart guidelines and Marine Park Partnerships for collaboration between MPA programs, resource agencies, coastal and indigenous communities, and tourism and recreation industries to sustain marine ecosystems and local economies.

What specific, clear and tangible results will be achieved and how will progress toward each result be measured over time? Identify performance measures to be used to indicate success at reaching all outcomes and/or performance.

The key performance measures are:

By 2017, managers of MPAs in two selected seascapes -will have implemented collaborative activities within the framework of Marine Park Partnerships.

By 2017, resource vulnerabilities and potential adaptation actions will have been identified using climate-smart guidelines for MPA managers in pilot sites with a primary focus on fisheries, traditional activities, and nature-based recreation.

By 2017, sustainable economic activities related to fisheries, commercial sport fisheries, traditional indigenous resource use, and nature-based recreation will have been identified and potential vulnerabilities and adaptation actions will have been identified.

By 2017, at least three workshops will have been organized in the pilot seascapes, with participation from key community members, indigenous community leaders, and local businesses.

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By 2017, development of recommended management actions for MPAs in the pilot seascapes will have been identified for consideration in future MPA management plan and operational plan updates.

Explain why the CEC is the most effective vehicle for the Parties to use in undertaking the project:

This project builds on and complements previous and ongoing CEC work to address sustainable marine ecosystems and the emerging science on blue carbon. It also helps develop a trinational understanding on how to improve management of marine protected areas in light of a changing climate. This cooperative work gives the three countries the opportunity to join forces at a seascape level to develop and apply climate-smart initiatives that would otherwise be disarticulated. In addition, the CEC is uniquely positioned to support the Parties in achieving their goal of maintaining resilient seascapes, ecosystems, and communities across North America.

Does the project propose a clear timeline for implementation of the activities, including a target end-date for CEC involvement? Where applicable, describe how the work will continue after CEC involvement ends.

The proposed project will be implemented during the 2015–2016 Operational Plan. At the end of the project, the outcomes will serve as a model for broader implementation of trilateral partnerships to enhance conservation at the local and system levels and at the same time improve communities' livelihoods by increasing social and ecological resilience at a the seascape level. In addition, landscape and seascape planning will benefit by expanding MPA networks and improving ecological connectivity.

Where applicable, identify with reasonable specificity:

Linkages with other relevant CEC projects, past or present, in order to create synergies, capitalize on experience, or avoid duplication

The project will be linked to current and proposed CEC blue carbon projects, as well as past projects such as the CEC's 2011–2012 project on *Engaging Communities to Conserve Marine Biodiversity through NAMPAN*, which developed scientific and planning guidelines to design resilient MPA networks in a changing climate. The guidelines will be used to inform some of the proposed seascape-level initiatives. Additionally, the project builds on JPAC discussions/recommendations from the 6–7 November 2014 meeting in Arlington, Virginia on "North America's Coasts in a Changing Climate."

- **The beneficiaries of capacity building activities that the project may include**

The project will also establish Marine Park Partnerships that will enhance the capacity of MPA managers through joint workshops and information exchange.

- **The relevant stakeholders, with particular attention to communities, academia, NGOs and industry, and their involvement and contribution to a successful outcome**

The major stakeholders in each seascape selected will be involved in the project, including indigenous community leaders, nature-based recreation tour operators, fishers, commercial sport industry operators, boaters, kayakers, and divers.

Marlow Pellat – Canadian Parks and Protected Areas, Parks Canada

Lauren Wenzel – Acting Director, National Marine Protected Areas Center, NOAA

Mariana Bellot Rojas – General Director for Institutional Development and Promotion, Conanp

Ivana Fernández Stohanzlova – International Cooperation, Conanp

Laura Martinez Martínez Pepin Lehalleur – International Cooperation, Conanp

Andrew John Rhodes Espinoza – Strategies for Climate Change, Conanp

Valeria Arlette García Lara – Strategies for Climate Change, Conanp

Regional directors and MPA directors in charge of marine parks (pilot sites)

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