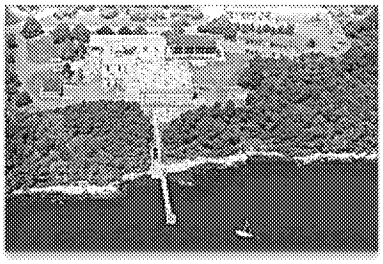

New England State Commissioners' Visit to
US EPA Office of Research and Development (ORD)
Atlantic Ecology Division (AED)

June 19, 2018

27 Tarzwell Drive
Narragansett, RI 02882

AGENDA

8:15 am **Registration in AED Front Lobby**
US EPA staff will meet you in the main lobby and escort you to the meeting room.
Lisa Matthews, Senior Advisor and State Liaison, EPA ORD

8:30 am **Welcome and Introductions**
- *Chris Robbins, Acting Deputy Assistant Administrator for Management, EPA ORD*
- *Paul Mercer, Commissioner, Maine DEP and ERIS Board Member*
- *Alexandra Dunn, Regional Administrator, EPA Region 1*
- *Ken Wagner, Senior Advisor to the Administrator for Regional and State Affairs, EPA*

8:45 am **Overview of US EPA ORD: Science and Technical Capabilities**
Jennifer Orme-Zavaleta, Principal Deputy Assistant Administrator for Science, EPA ORD

9:05 am **States' Perspectives/Topics of Interest**
States are requested to informally talk about some of their most pressing environmental challenges and related science needs.
- Connecticut DEEP
- Maine DEP
- Massachusetts DEP
- New Hampshire DES
- Rhode Island DEM
- Vermont ANR

10:00 am **Break**

10:15 am **Nutrients**
- State perspective (Massachusetts DEP)
  States will tee up issues for the topic sessions, and if possible, give examples from their state's experiences.
- EPA research (Anne Rea)
- Roundtable discussion

11:00 am **Algal Blooms**
- State perspective (Vermont DEC)
- EPA research and Cyanobacteria Assessment Network (CyAN) mobile app demonstration (Darryl Keith)
- Roundtable discussion

11:30 pm **PFAS**
- State perspective (New Hampshire DES)

- EPA research on human health/toxicity, analytical methods, site characterization, exposure and remediation/treatment (Andy Gillespie)
- Roundtable discussion

12:30 pm **Working Lunch**
Order in from Panera, self-pay

1:00 pm **EPA's CompTox Chemistry Dashboard**
- Brief overview and demonstration of potential use applications (e.g., Endocrine Disrupting Chemicals and PFAS)
  Reeder Sams, EPA ORD

1:20 pm **Coastal Resilience**
- State perspective (Maine DEP)
- EPA research (Cathy Wigand)
- Roundtable discussion

1:50 pm **Break**

2:00 pm **ORD Leadership Update**
Jennifer Orme-Zavaleta and Chris Robbins, EPA ORD
- ORD Strategic Plan
- State engagement in ORD's Strategic Research Action Plans refresh
- EPA Science Inventory
- Budget

2:30 **AED Overview**
Wayne Munns, Director, ORD Atlantic Ecology Division

2:45 pm **Facility Tour**
Including analytical laboratories, an estuarine "wet" laboratory, a research greenhouse, boat house, field sampling capabilities and green roof

4:00 pm **Break**

Return to Conference Room

4:15 pm **Recap today's discussion, state feedback and next steps**
Lisa Matthews and Paul Mercer

4:30 pm **Adjourn**

Agenda Topic Descriptions

Overview of EPA Office of Research and Development

The Office of Research and Development (ORD) is the scientific research arm of EPA, whose leading-edge research helps provide the solid underpinning of science and technology for the Agency. ORD supports six research programs that identify the most pressing environmental health research needs with input from EPA program and regional offices, partners and stakeholders. Strategic Research Action Plans outline the research underway in the programs. The research is conducted by ORD's three national laboratories, four national centers, and two offices located in 12 facilities across the country and in Washington, DC.

Nutrients

Nutrient pollution (i.e., nitrogen and phosphorus) remains one of the most challenging environmental and human health issues in the US, with a considerable impact on local and regional economies and can cause adverse environmental impacts (e.g., acid rain, harmful algal blooms, and degradation of drinking-source waters). EPA ORD's research efforts span multiple types of water bodies, and coordinate across media (water, land and air) and various temporal and spatial scales to develop numeric nutrient criteria, decision support tools, and cost-effective approaches to nutrient reduction. These efforts are being used by New England to assist with: informing development of nutrient and related criteria and standards, evaluating approaches to nutrient management and mapping, evaluating the effects of excess nutrients on aquatic resources, using data-intensive models to predict occurances of harmful algal blooms, developing methods for quantification of cyanotoxins in drinking water, and encouraging development of nutrient sensors.

Cyanobacteria Assessment Network (CyAN): An early warning indicator for toxic and nuisance blooms using ocean color satellites

Harmful blooms of cyanobacteria (blue-green algae) in drinking water reservoirs and other freshwater systems cause public health concerns and increase drinking water processing costs. Early detection of emerging blooms can inform management actions to minimize these and other adverse effects. The CyAN mobile app, available on Android devices, helps water quality managers monitor cyanobacterial harmful algal blooms (HABs). The app uses satellite data to map the location of cyanobacterial HABs in fresh and coastal waters across US – providing rapid information about concentrations in US water bodies that can be used to inform decisions regarding recreational and drinking water safety. EPA is collaborating with NASA, NOAA and USGS; the app uses data from the European Space Agency Copernicus Sentinel-3 satellite Ocean. The app provides intuitive ability to scan water bodies for changes in cyanoHAB abundance all without having to filter through numerous satellite images of water bodies not associated with their region of interest. The app allows managers to select a location of interest to quickly visualize the quantified cyanoHAB value, provides a spatial context for the larger water body, and temporal time series capabilities. The app is currently available for beta testing; if interested, contact Blake Schaeffer (schaeffer.blake@epa.gov).

PFAS

Per- and polyfluoroalkyl substances (PFAS) are of growing concern across the US. PFAS have physicochemical properties that make them ideal in many commercial products and applications such as fire-fighting foams and water-repellant textiles. However, these same properties lead to persistence in environmental media and exposed ecological and mammalian populations. There is evidence that PFAS induce a host of health outcomes with hepatic, reproductive, developmental, immunological and metabolic syndrome (e.g., lipid homeostasis) effects in humans and other organisms. There is growing public concern about exposure and effects of PFAS, driven in part by increasing public reports of potential human exposure to PFAS primarily via water, often in association with industrial activities or contaminated sites. The growing public concern combined with the general lack of information about newer generation PFAS, such as GenX or ADONA, is creating challenges for states, tribes and other entities responsible for protecting public health and the environment. States, tribes and other responsible officials often lack the resources to collect, assemble and evaluate the evolving landscape of basic PFAS exposure, hazard and mitigation science needed to inform decisions about potential risks to human health and the environment among respective constituencies. EPA is currently conducting

several lines of research to develop and apply scientific information and tools to enable states, tribes and EPA's program and regional offices to make informed decisions for protecting protect public health and the environment from harm associated with PFAS.

EPA's CompTox Chemistry Dashboard

Information and data on chemicals is used by scientists to evaluate potential health and ecological risks due to environmental exposures. EPA's CompTox Chemistry Dashboard helps evaluate the safety of chemicals by providing public access to a variety of information on over 760,000 chemicals currently in use. Within the Dashboard, users can access chemical structures, chemistry information, toxicity data, hazard data, exposure information, and additional links to relevant websites and applications. These data are compiled from sources including the EPA's computational toxicology research databases, and public domain databases such as the National Center for Biotechnology Information's PubChem database. EPA's CompTox Chemistry Dashboard is available at https://www.epa.gov/chemical-research/chemistry-dashboard

Coastal Resilience: Development and implementation of an adaptive restoration strategy for management of coastal marsh systems

Sea level rise is causing shoreline erosion, increased coastal flooding, and marsh vulnerability to the impact of storms. Coastal marshes provide flood abatement, water quality maintenance, and habitat for fish, shellfish and wildlife. In partnership with RI Coastal Resource Management Council, Department of Environmental Management, US Fish and Wildlife Service, and others, EPA ORD developed and is implementing an adaptive restoration strategy. This adaptive restoration framework supports stakeholders for managing coastal marshes and enhancing system resiliency in Rhode Island. A common adaptive management approach previously used for restoration projects was modified to identify climate-related vulnerabilities and plan adaptive actions. The strategy recommends an experimental BACI (Before-After, Control-Impact) design, described as pre- and post-sampling at the impact site and one or more control sites. Specific adaptive restoration actions are either under consideration or underway in Rhode Island, including increasing marsh elevation (i.e., beneficial use of dredged materials), shoreline stabilization, and enabling upland marsh migration.

EPA ORD's Atlantic Ecology Division

The Atlantic Ecology Division (AED), located in Narragansett, RI, is part of EPA ORD's National Health and Environmental Effects Research Laboratory. AED performs research to identify and quantify the ecological effects of anthropogenic stressors on coastal waters and watersheds of the Atlantic seaboard. This research provides data, models, decision support tools and technical support to EPA program and regional offices, state and local governments, and others to support our joint mission to protect human health and the environment. AED's research addresses national scale issues, with special emphasis given to Northeast estuaries and their watersheds, providing information that informs decision making at multiple levels of governance. AED actively promotes science communication, translation and outreach, by hosting and participating in numerous educational events each year. AED laboratory facilities consist of office space, "dry" analytical laboratories, an estuarine "wet" laboratory, a research greenhouse, and field sampling capabilities. Ongoing renovations, aimed at modernizing facility infrastructure and enhancing energy and water usage efficiencies, include installation of solar panels, a gylcol solar collector to heat domestic water, and green roofs. Large portions of AED's grounds have been converted to native meadows to promote pollinator health.