Atlantic Sturgeon Presence Around Areas of Navy Activities in the Chesapeake Bay

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Atlantic Sturgeon Life Cycle

- Atlantic sturgeon are anadromous, spending 1-3 years in fresh water before heading to sea
- Become coastal wanderers along the continental shelf, migrating seasonally
- As adults, 88% of Atlantic sturgeon return to their natal rivers to spawn:
  - Males every 1-2 years
  - Females every 2-5 years

Photo Credits: Chris Hager

Atlantic Sturgeon Life Cycle

- Grow up to 14 feet long and weigh as much as 800 lbs
- Northern fish grow slower than those further south
- Can live up to 60 years in the north, less in the south
- Reach sexual maturity as early as 5 years in Georgia and as late as 30 years in Canada; mature around age 12 in the Chesapeake Bay

Photo Credit: Ramsey Noble

Photo Credit: Jason Kahn

Sturgeon Tagging Location
Kilmarnock
Onan
MATTAPONI RESERVATION
PAMUNKEY RESERVATION
sville
land Springs
NEW KENT CO AIRPORT
MOND INTL AIRPORT
West Point
CHESAPEAKE BAY
Exr
11 m
CAMP PEARY NAVAL RESERVATION
CAMP PEARY LANDING STRIP
NSC CHEATHAM ANNEX
NWS YORKTOWN
Hopewell
Williamsburg
WILLIAMSBURG JAMESTOWN AIRPORT
Gloucester Point
U.S. NAVAL SUPPLY CENTER
FORT EUSTIS
FELKER AAF
NEWPORT NEWS WILLIAMSBURG INTL AIRPORT
Poquoson
LANGLEY AFB
LANGLEY AFB
LANGLEY AFB CLEAR ZONE PARCEL
Hampton
FORT MONROE
Smithfield
Newport News
NORFOLK NS
NAVAL STATION NORFOLK
NSA NORFOLK
JOINT EXPEDITIONARY BASE LITTLE CREEK
JOINT EXPEDETIONARY BASE LITTLE CREEK - FORT STORY
CRANEY ISLAND DISPOSAL AREA
NORFOLK INTL AIRPORT
NAVAL MED CENTER
Norfolk
Virginia Beach
33
5
10
17
60
31
0 4 8 12 16 Kilometers
0 4 8 12 16 Miles
Hagerstown
Wilmington
NEW JERSEY
MARYLAND
Frederick
Vineland
Baltimore
Columbia
Germantown
Dover
Delaware Bay
Washington, D.C.
Annapolis
DELAWARE
Dale City
Fredericksburg
California
Salisbury
Chesapeake Bay
Richmond
Hampton
Virginia Beach

Atlantic Sturgeon Tagging in the Pamunkey River

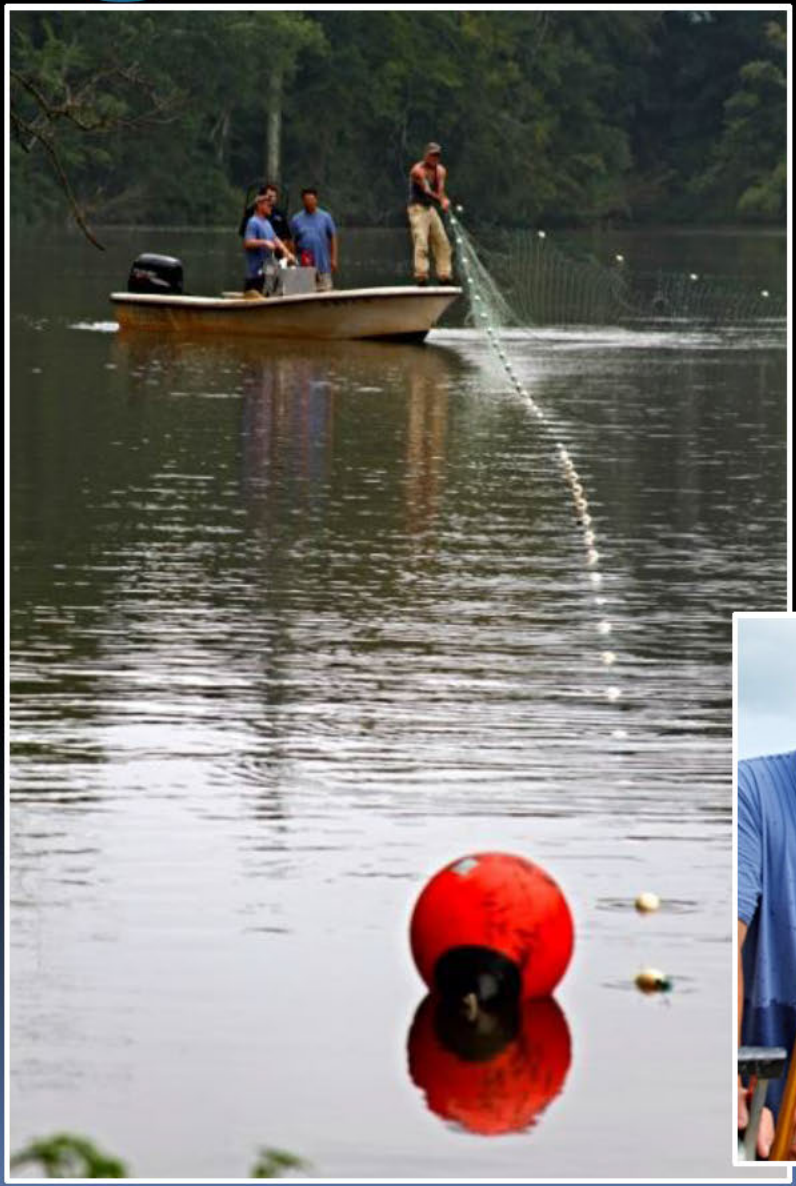

Photo Credits: Sarah Rider

Photo Credit: Jason Kahn

Atlantic Sturgeon Tagging in the Pamunkey River

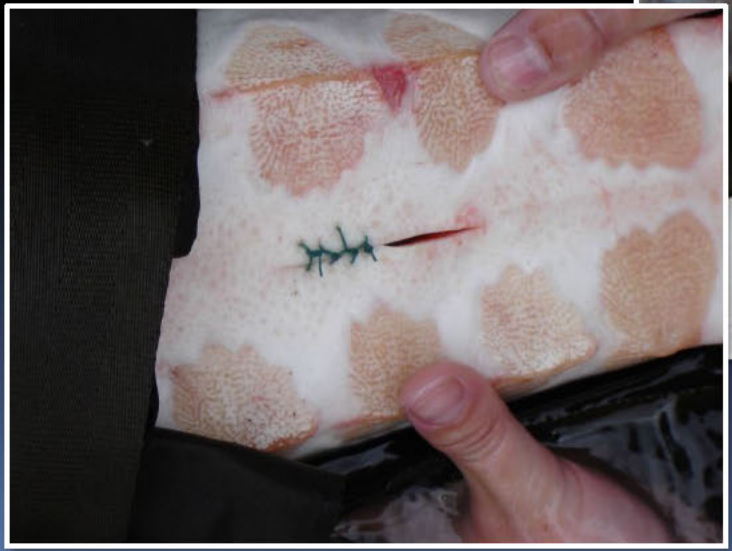

Photo Credits: Sarah Rider

Atlantic Sturgeon Tagging in the Pamunkey River

2013 Sampling Period

- Sampling occurred from August through October
- 17 sturgeon were tagged
  - 11 males
  - 1 female
  - 5 unknown
- 2 sturgeon were recaptured
- 2013 spawning population estimate: 75 individuals (17-168 95% C.I.)

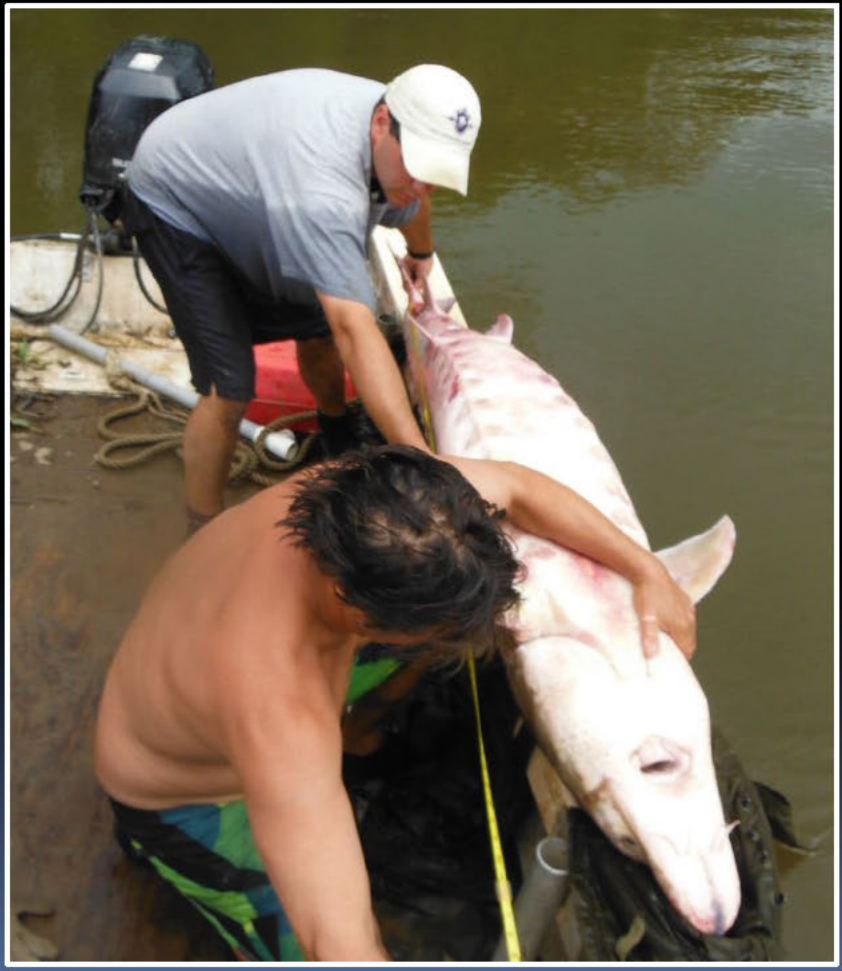

Photo Credit: Ramsey Noble

Atlantic Sturgeon Tagging in the Pamunkey River

2014 Sampling Period

- Sampling occurred in August and September
- 63 sturgeon were tagged
  - 40 males
  - 4 females
  - 19 unknown
- 13 sturgeon were recaptured
- 2014 spawning population estimate: 151 individuals (89-213 95% C.I.)

Photo Credit: Ramsey Noble

Atlantic Sturgeon Tagging in the Pamunkey River

Received November 13, 2

Rec
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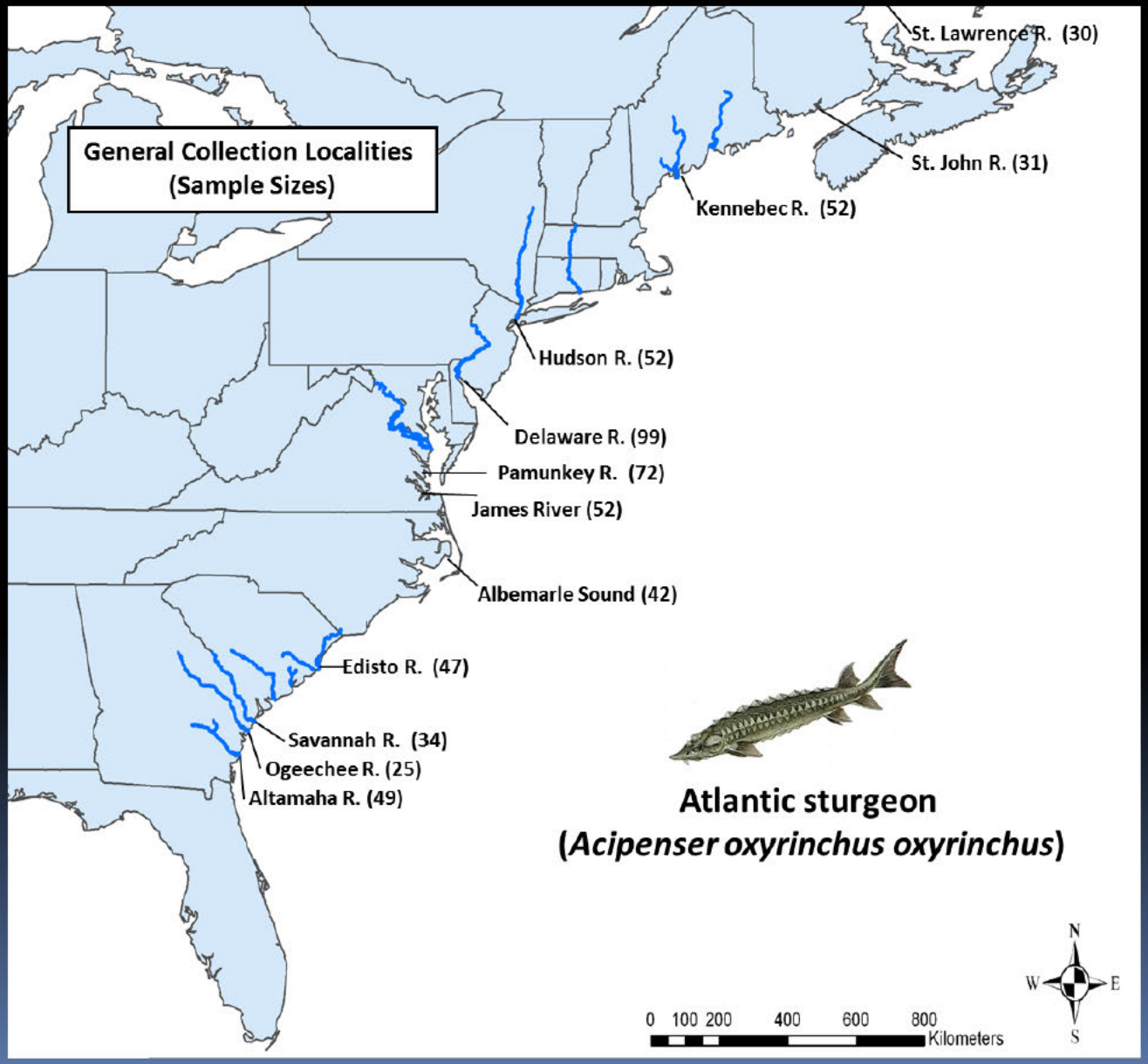
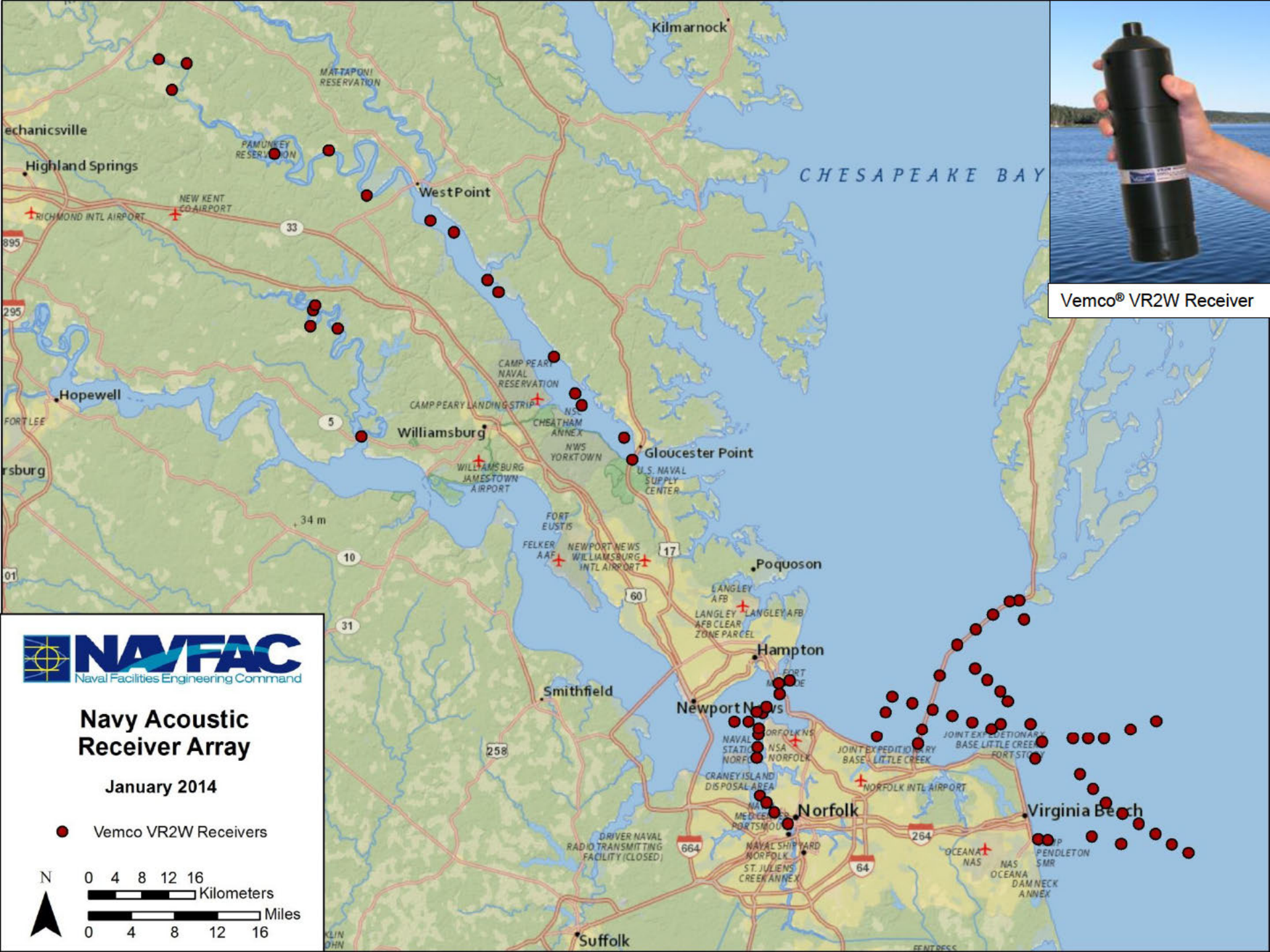
Atlantic Sturgeon Tagging in the Pamunkey River




Navy Acoustic Receiver Array
January 2014
Vemco VR2W Receivers
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Kilometers
Miles
0 4 8 12 16
NAVFAC
Naval Facilities Engineering Command
Vemco® VR2W Receiver
CHESAPEAKE BAY
Kilmarnock
MATTAPONI RESERVATION
echanicsville
Highland Springs
PAMUNKEY RESERVATION
NEW KENT CO AIRPORT
RICHMOND INTL AIRPORT
West Point
Hopewell
FORT LEE
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CAMP PEARY NAVAL RESERVATION
CAMP PEARY LANDING STRIP
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NAVAL STATION NORFOLK
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JOINT EXPEDITIONARY BASE LITTLE CREEK
JOINT EXPEDITIONARY BASE LITTLE CREEK FORT STORY
CRANEY ISLAND DISPOSAL AREA
NORFOLK INTL AIRPORT
Norfolk
Virginia Beach
DRIVER NAVAL RADIO TRANSMITTING FACILITY (CLOSED)
NAVAL SHIPYARD NORFOLK
ST. JULIENS CREEK ANNEX
OCEANA NAS
NAS OCEANA
DAM NECK ANNEX
PENDLETON SMR
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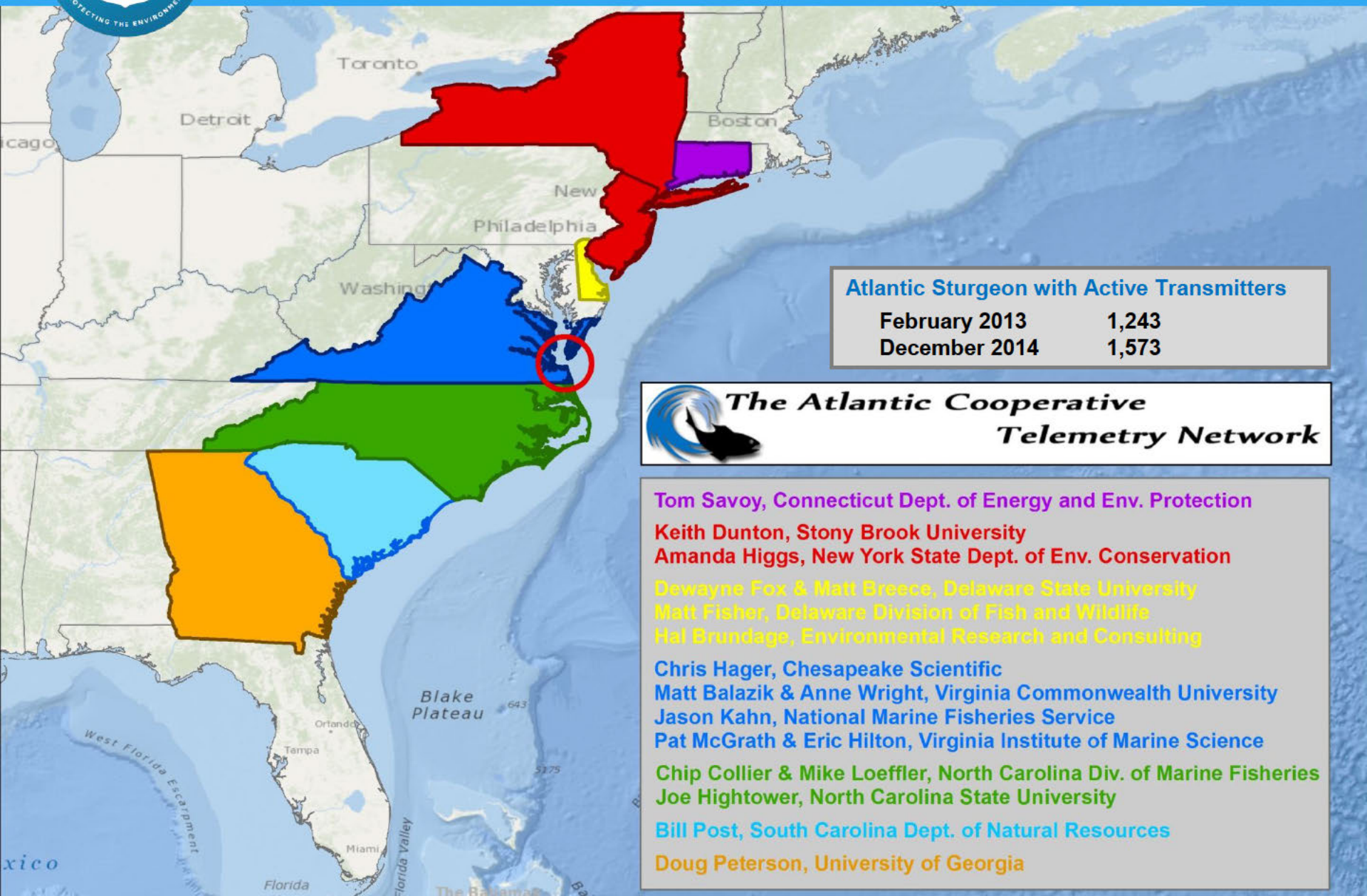
Navy Receiver Array in the Lower Chesapeake Bay



Atlantic Sturgeon with Active Transmitters

February 2013	1,243
December 2014	1,573

The Atlantic Cooperative Telemetry Network

Tom Savoy, Connecticut Dept. of Energy and Env. Protection

Keith Dunton, Stony Brook University
Amanda Higgs, New York State Dept. of Env. Conservation

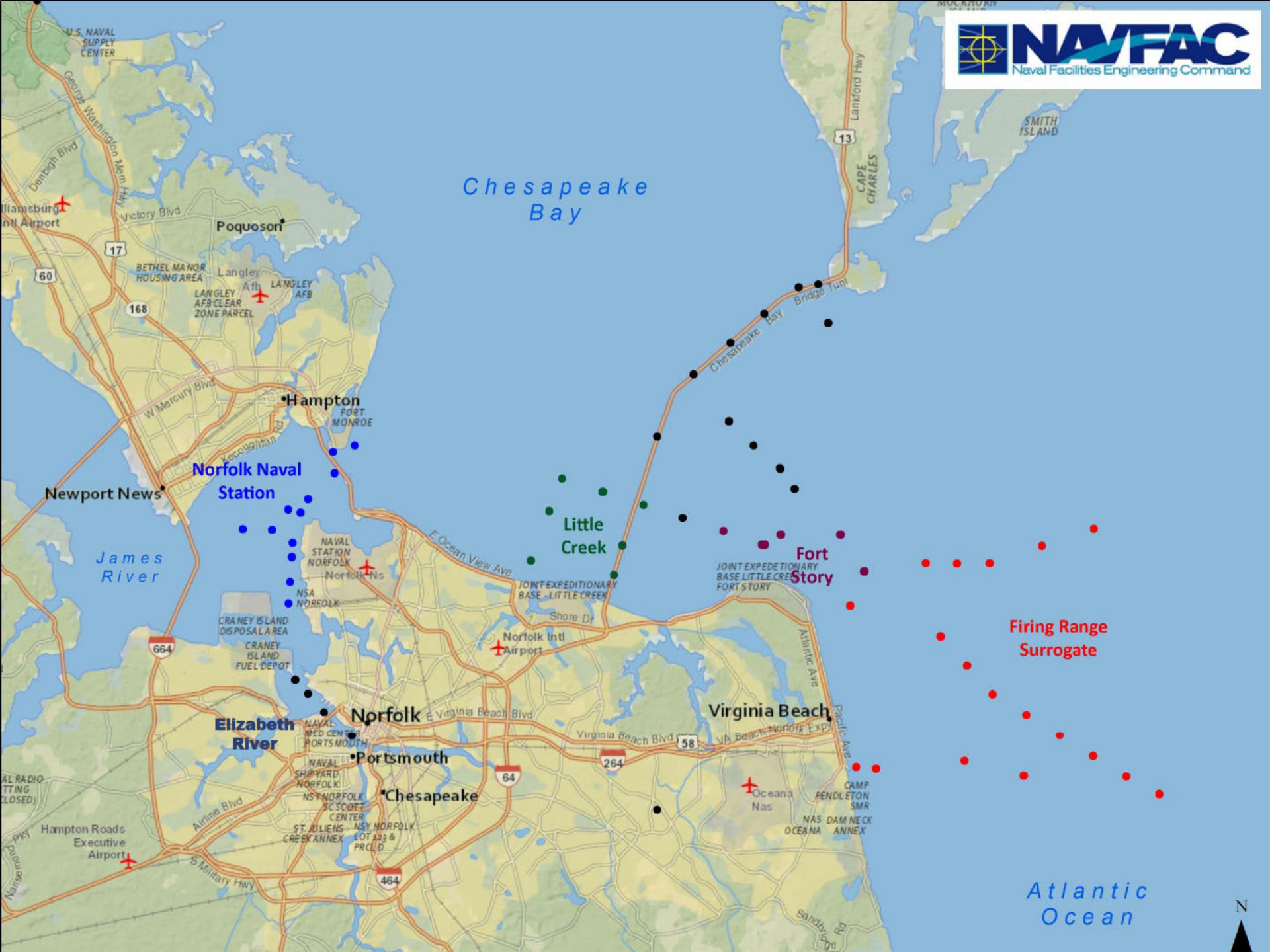
Dewayne Fox & Matt Breece, Delaware State University
Matt Fisher, Delaware Division of Fish and Wildlife
Hal Brundage, Environmental Research and Consulting

Chris Hager, Chesapeake Scientific
Matt Balazik & Anne Wright, Virginia Commonwealth University
Jason Kahn, National Marine Fisheries Service
Pat McGrath & Eric Hilton, Virginia Institute of Marine Science

Chip Collier & Mike Loeffler, North Carolina Div. of Marine Fisheries
Joe Hightower, North Carolina State University

Bill Post, South Carolina Dept. of Natural Resources

Doug Peterson, University of Georgia


NAVFAC
Naval Facilities Engineering Command
Chesapeake Bay
James River
Atlantic Ocean
Norfolk Naval Station
Little Creek
Fort Story
Firing Range Surrogate
Elizabeth River
Poquoson
Hampton
Newport News
Norfolk
Portsmouth
Chesapeake
Virginia Beach
Norfolk Intl Airport
Hampton Roads Executive Airport
Langley Afb
Norfolk Ns
Oceana Nas
U.S. NAVAL SUPPLY CENTER
George Washington Mem Hwy
Denbigh Blvd
Victory Blvd
BETHEL MANOR HOUSING AREA
LANGLEY AFB CLEAR ZONE PARCEL
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W Mercury Blvd
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Shore Dr
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Atlantic Ave
Pacific Ave
E Virginia Beach Blvd
Virginia Beach Blvd
VA Beach Norfolk Expy
NAVAL MED CENTER PORTSMOUTH
NAVAL SHIPYARD NORFOLK
NSY NORFOLK SC SCOTT CENTER
ST. JULIENS CREEK ANNEX
NSY NORFOLK LOT 123 & PRCL D
Airline Blvd
S Military Hwy
Nansemond Pky
Lankford Hwy
CAPE CHARLES
SMITH ISLAND
Chesapeake Bay Bridge Tunl
CAMP PENDLETON SMR
NAS OCEANA
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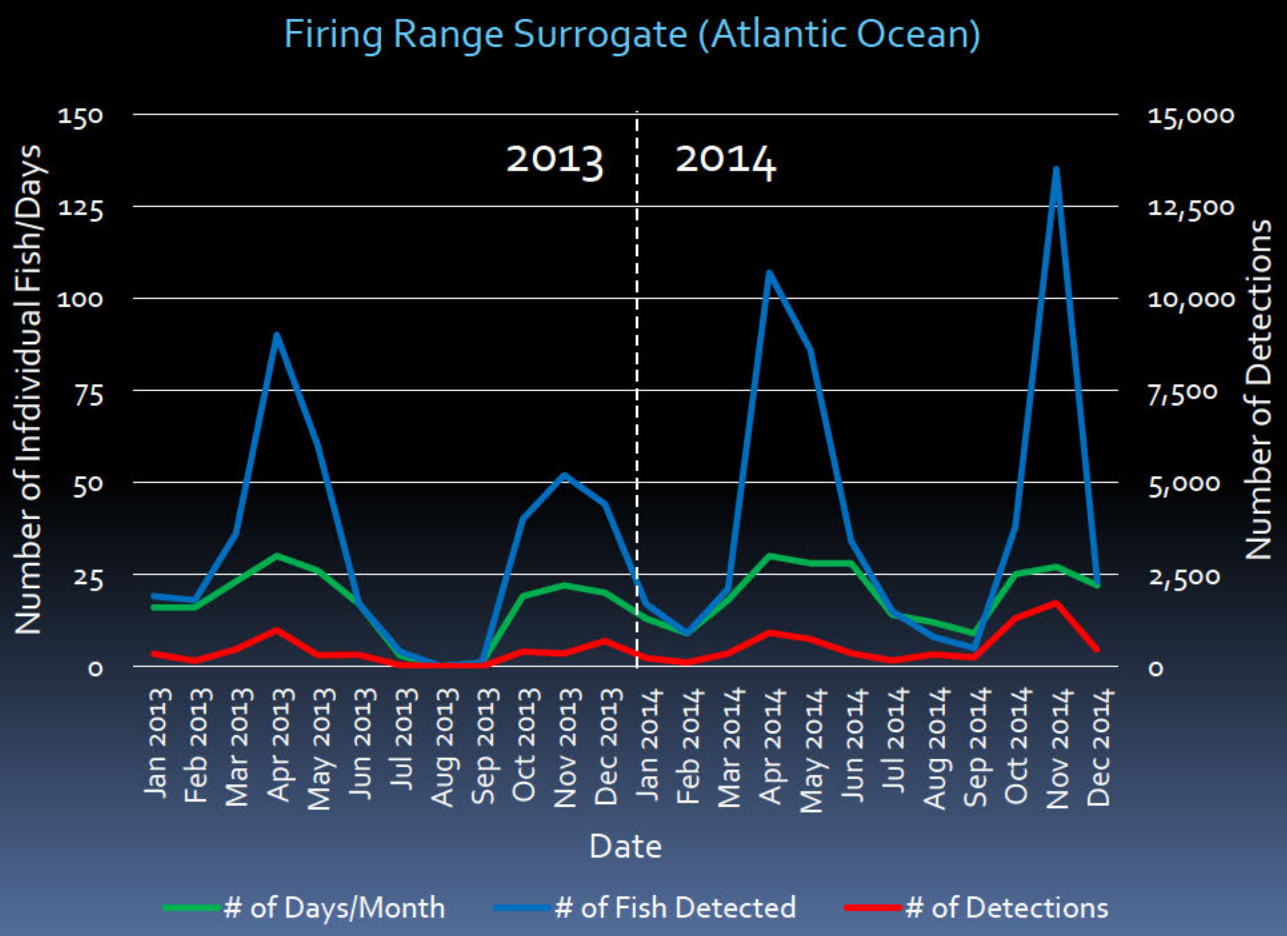
Navy Receiver Array in the Lower Chesapeake Bay



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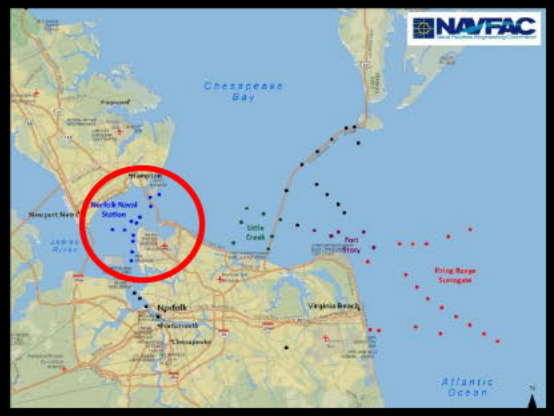

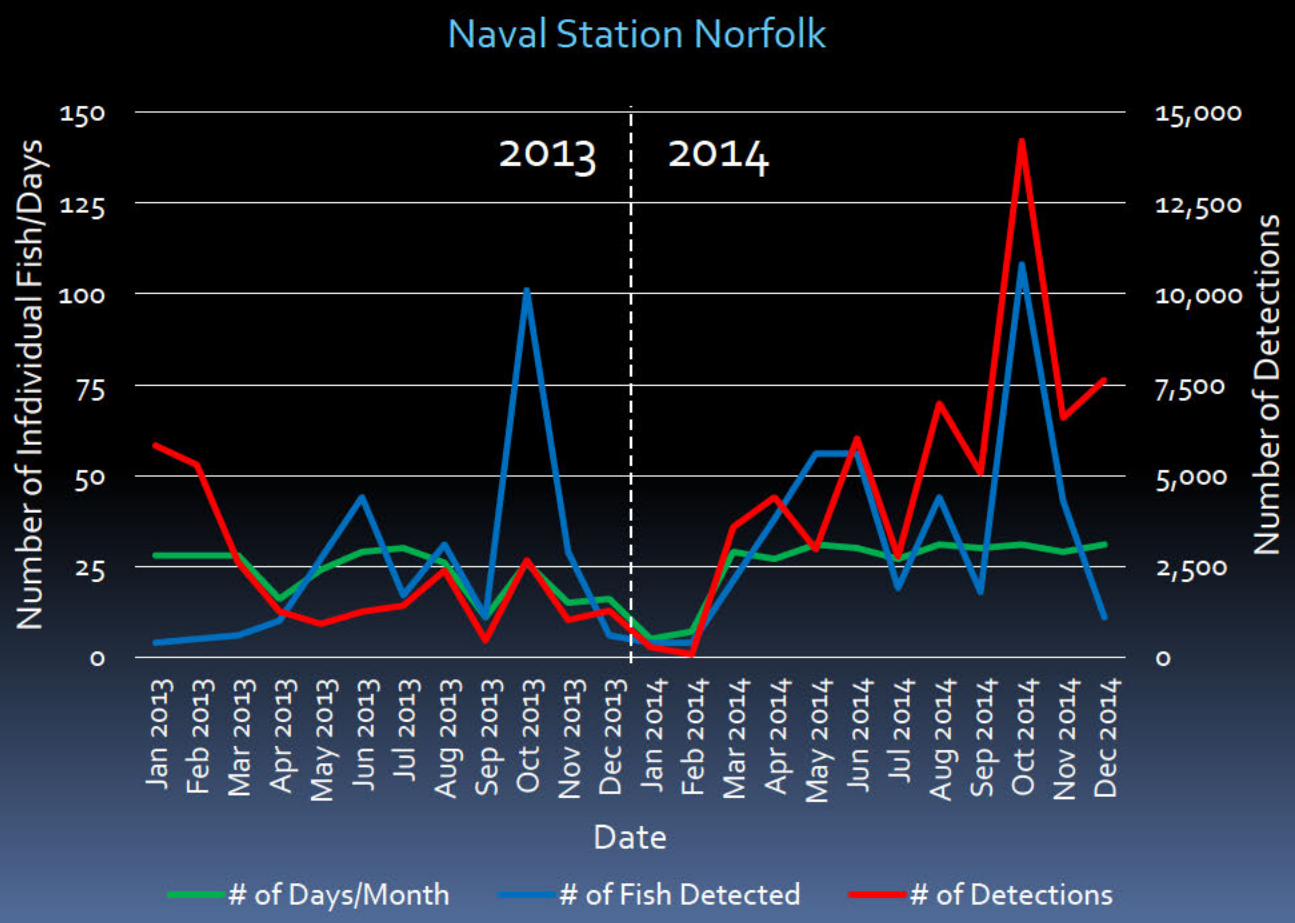

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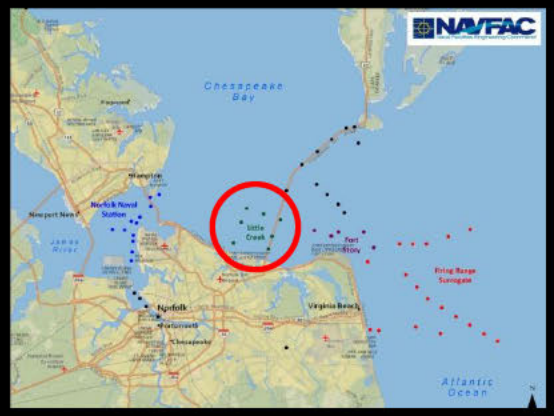

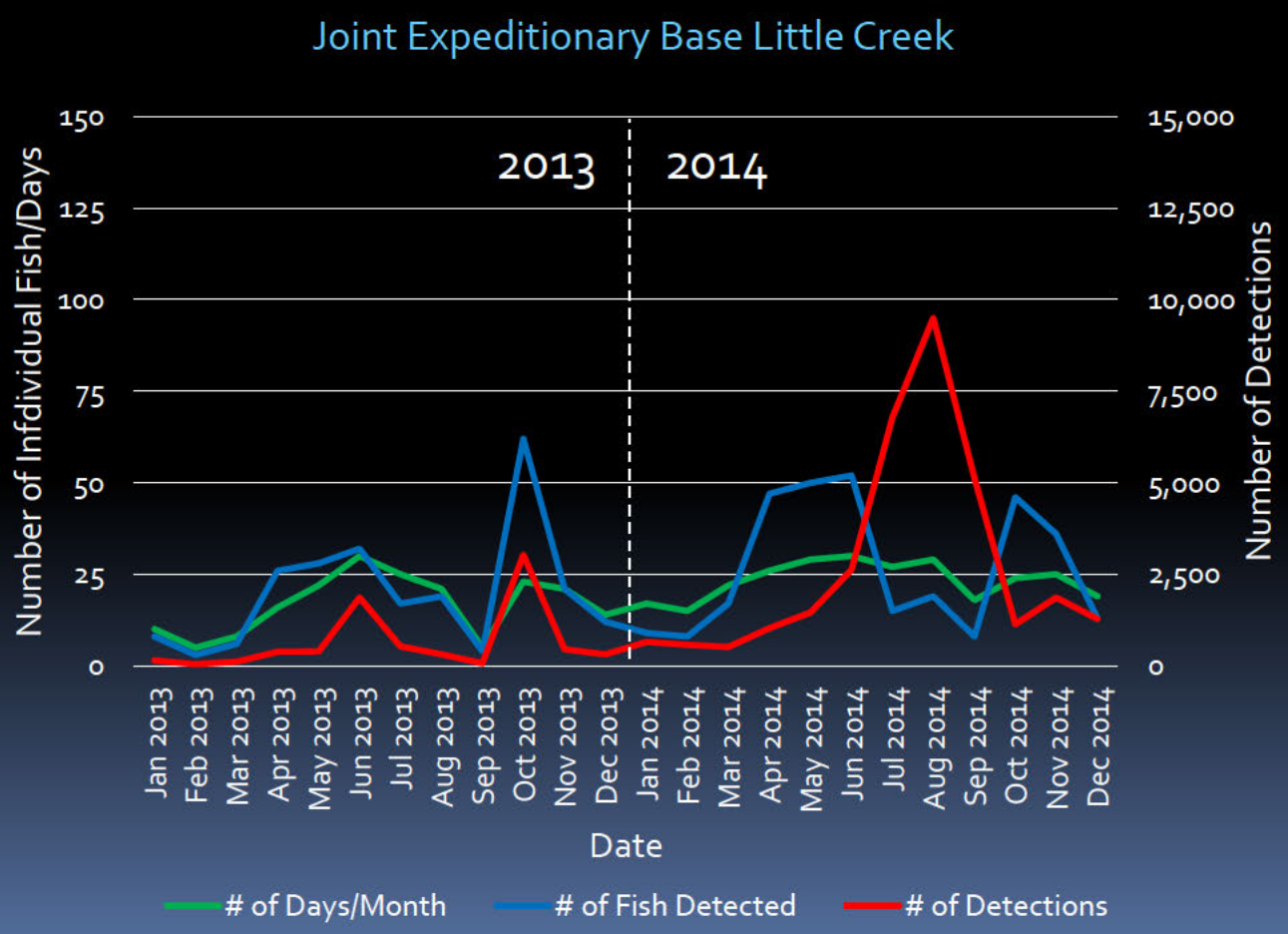

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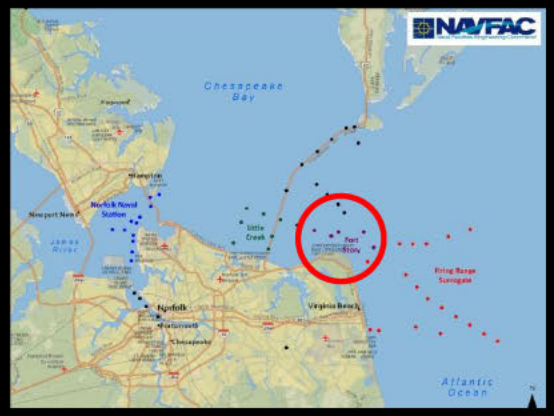

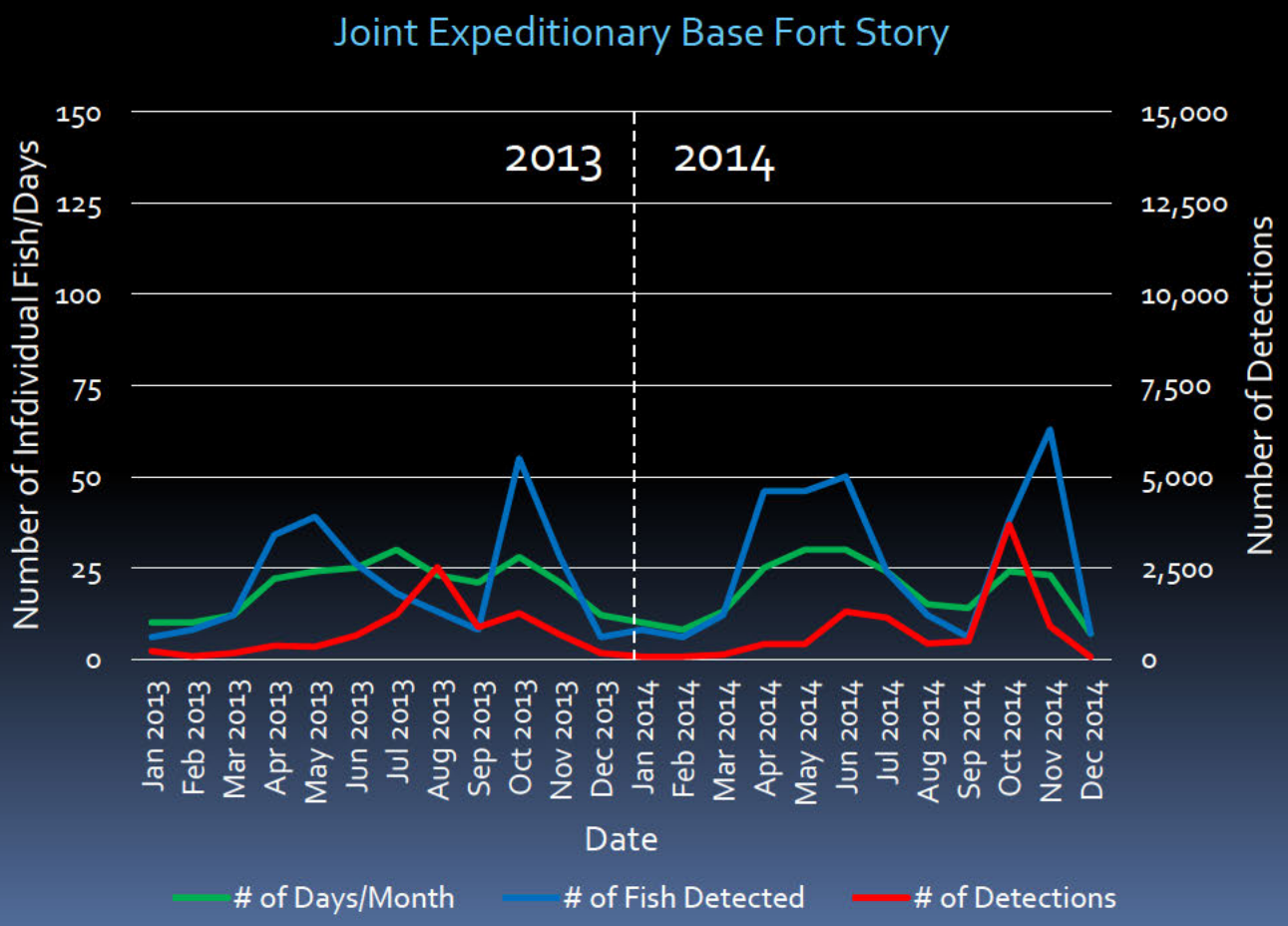

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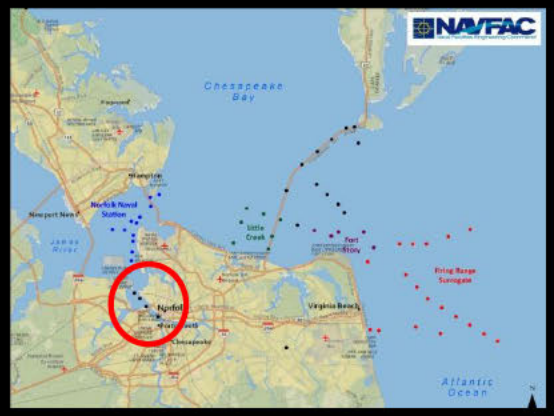

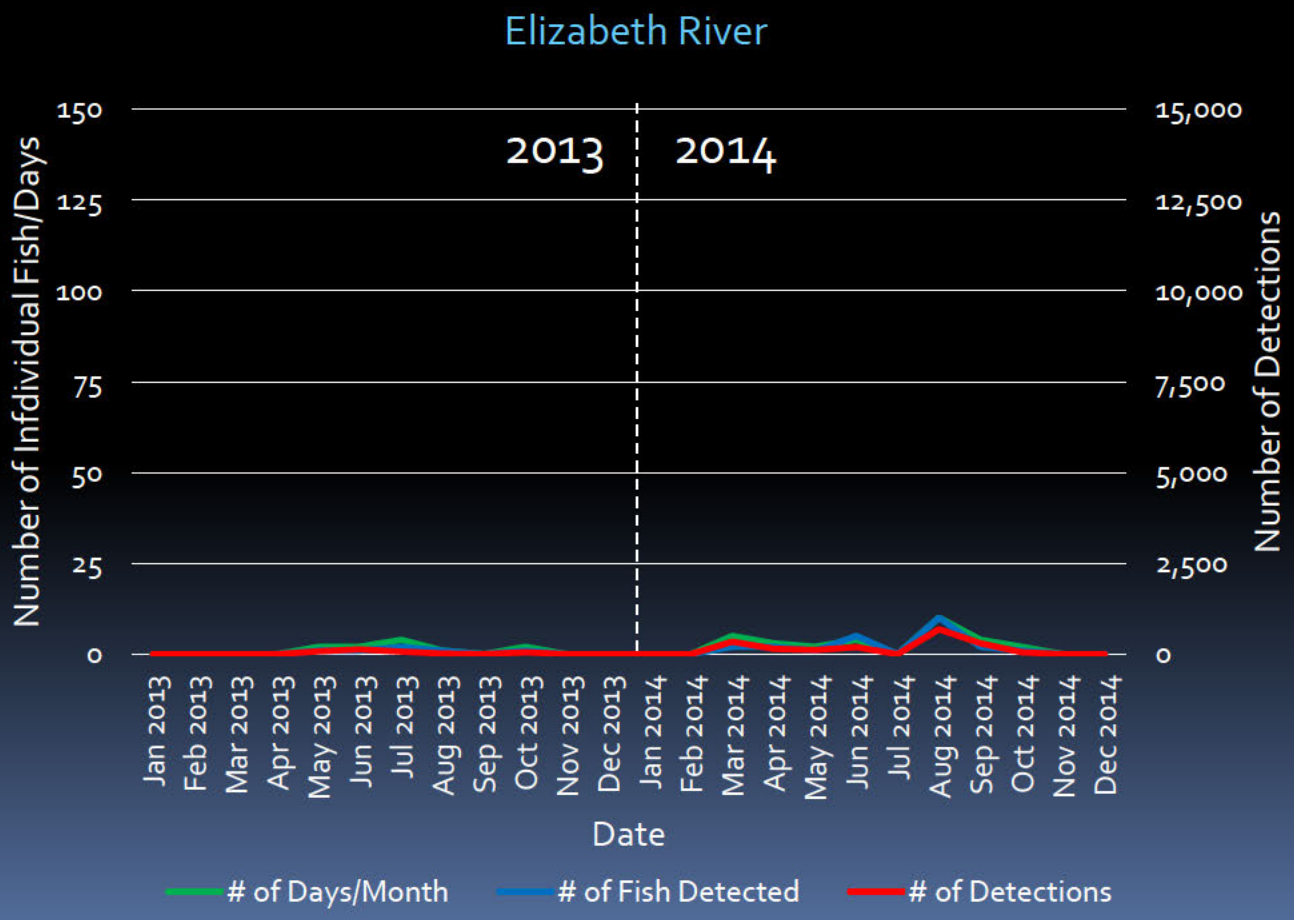

Navy Receiver Array in the Lower Chesapeake Bay

From December 2012 through December 2014, the Navy's Chesapeake Bay receiver array had 617,057 detections of 1,098 individual fish:

Species	*Navy Tagged*	*# of Fish Detected*
Atlantic sturgeon	Partially (7%)	653
Black drum		3
Blue catfish		2
Blueback herring	Yes	45
Speckled trout		1
Striped bass		46
Blacktip shark		1
Bull shark		4
Sand tiger shark		156
Sandbar shark		19
Spinner shark		1
Spiny dogfish		7
White shark		5
Cownose ray		27
Green turtle	Yes	3
Kemp's ridley turtle	Yes	11
Loggerhead turtle	Partially (92%)	13

Navy Receiver Array in the Lower Chesapeake Bay

U.S. NAVY STEWARDS OF THE SEA — DEFENDING FREEDOM — PROTECTING THE ENVIRONMENT

Department of the Navy — United States of America

NOAA — National Oceanic and Atmospheric Administration — U.S. Department of Commerce

U.S. Fish & Wildlife Service — Department of the Interior

USGS — science for a changing world

NASA

BOEM — Bureau of Ocean Energy Management

Smithsonian Environmental Research Center

Connecticut Energy Environment

Delaware Department of Natural Resources and Environmental Control

District Department of the Environment

Maine DMR Marine Resources

MassDEP

Department of Environmental Conservation — New York State

New York State Thruway Authority

Maryland Department of Natural Resources

Virginia Department of Game & Inland Fisheries

North Carolina Marine Fisheries

South Carolina Department of Natural Resources

Riverhead Foundation for Marine Research & Preservation

Virginia Aquarium

Wildlife Conservation Society

Delaware State University

East Carolina University

North Carolina State University

Stony Brook University

University of Delaware

The University of Georgia

University of Maryland 1856

University of Massachusetts Dartmouth 1895

Westvirginia University

Virginia Commonwealth University — MCV — RPI — 1838

William & Mary VIMS — Virginia Institute of Marine Science — School of Marine Science

Florida Atlantic University — Est. 1961