NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE

NOAA In Your State

Pennsylvania

***NOAA** is an agency that enriches life through science. Our reach goes from the surface of the sun to the depths of the ocean floor as we work to keep citizens informed of the changing environment around them. From daily weather forecasts, severe storm warnings, and climate monitoring to fisheries management, coastal restoration and supporting marine commerce, NOAA's products and services support economic vitality and affect more than one-third of America's gross domestic product. NOAA's dedicated scientists use cutting-edge research and high-tech instrumentation to provide citizens, planners, emergency managers and other decision makers with reliable information they need when they need it.*

The following is a summary of NOAA facilities, staff, programs, or activities based in, or focused on, your state or territory: Starting with highlights, then by congressional districts and cities or towns, Great Lakes programs, and then statewide programs.

Highlights of NOAA in Pennsylvania

Middle Atlantic River Forecast Center	State College	PA-15
Delaware River and Bay PORTS®	Statewide	
Damage Assessment, Remediation, and Restoration Program	Statewide	
Bipartisan Infrastructure Law (BIL) / Inflation Reduction Act (IRA) Projects	Statewide	

The state of Pennsylvania is home to two Weather Forecast Offices, three Science on a Sphere displays, Pennsylvania Sea Grant College Program, and multiple observing platforms.

Weather Forecast Offices

State College PA-15

Pittsburgh PA-12

National Weather Service (NWS) Weather Forecast Offices (WFO) are staffed 24/7/365 and provide weather, water, and climate forecasts and warnings to residents of Pennsylvania. There are 122 WFOs nationwide of which two are in Pennsylvania. Highly trained forecasters issue warnings and forecasts for events, including severe thunderstorms, tornadoes, hurricanes, winter storms, floods, and heat waves to the general public, media, emergency management and law enforcement officials, the aviation and marine communities, agricultural interests, businesses, and others. Information is disseminated in many ways, including wireless emergency alerts, social media,weather.gov, and NOAA Weather Radio All Hazards. Each WFO has a Warning Coordination Meteorologist who actively conducts outreach and educational programs that strengthen working relationships with local partners in emergency management, government, the media and academic communities. Forecasters provide Impact-based Decision Support Services (IDSS), both remotely and on-site during critical emergencies such as wildfires, floods and chemical spills, and major recovery efforts. To gather data for forecasting and other purposes, NWS WFO staff monitor, maintain and use Automated Surface Observing Stations and Doppler Weather Radar. In addition to the WFOs, NWS operates specialized national prediction centers and regional headquarters throughout the U.S. for a total of 168 operational units. Over 85% of NWS' workforce is in the field. For current Pennsylvania weather, visit www.weather.gov and, on the national map, click on the relevant county or district.

Science On a Sphere®

Pottstown PA-4

Harrisburg PA-10

Easton PA-7

Science On a Sphere (SOS) is a room-sized global display system that uses computers and video projectors to display planetary data onto a six-foot diameter sphere, analogous to a giant animated globe. Researchers at NOAA developed Science On a Sphere® as an educational tool to help illustrate Earth System science to people of all ages. Animated images of atmospheric storms, climate change, and ocean temperature can be shown on the sphere, which is used to explain in a way that is simultaneously intuitive and captivating what are sometimes complex environmental processes. They are located at the Whitaker Center in Harrisburg, Montgomery County Community College in Pottstown, and the Nurture Nature Center in Easton.

PA-2
Philadelphia
National Ocean Service (NOS) - National Water Level Observation Network

NOS operates two long-term continuously operating tide stations in the state of Pennsylvania, which provide data and information on tidal datum and relative sea level trends, Great Lakes and interconnecting waterways datum and lake level regulation, and are capable of producing real-time data for storm surge warning. These stations are located at Philadelphia and Erie. The Philadelphia station is associated with a set of tidal benchmarks installed in the ground that is used to reference the height of the water levels and helps connect the water level to land. Station data feeds into many CO-OPS products that are used to support safe navigation, mitigate coastal hazards, and protect communities. Such products include:

- Coastal Inundation Dashboard - view water levels in real-time and during storms
- High Tide Flooding Outlooks
- Sea level trends and maps
- Real-time current measurements
- Hydrodynamic models
- Tidal and water level datums

PA-3, 5

Office of Oceanic and Atmospheric Research (OAR) - CoastWatch

The NOAA CoastWatch Great Lakes regional node obtains, produces, and delivers environmental data and products for near real-time observation of the Great Lakes to support environmental science, decision making, and supporting research. This is achieved by providing Internet access to near real-time and retrospective satellite data and products, as well as in-situ Great Lakes data. The CoastWatch node at Great Lakes Environmental Research Laboratory provides clients including Federal, state, and local agencies, academic institutions, commercial/industries, and the public, both within and outside of the Great Lakes region, with access to near real-time satellite observations and in-situ data for the Great Lakes. CoastWatch data are used in a variety of ways, including near real-time observation and tracking of algal blooms, plumes, ice cover, wind speed/direction, surface water intake temperatures at fish hatcheries, two and three dimensional modeling of Great Lakes physical parameters, such as wave height and currents, damage assessment modeling, research, and educational and recreational activities. In addition, through a cooperative project with Michigan Sea Grant, Great Lakes CoastWatch satellite-derived surface water temperature imagery is contoured and made available via Michigan State Sea Grant's website. Great Lakes CoastWatch data and products benefit riparians as well as research, operational, and recreational users.

Philadelphia

NOAA Office of Education - Environmental Literacy Program

The Environmental Literacy Program (ELP), administered by NOAA's Office of Education, provides grants and support for formal (K-12) and informal education to advance the agency's mission. In Pennsylvania, ELP funded a project by Drexel University in Philadelphia County. The project aims to enhance local resilience to climate change in Philadelphia neighborhoods impacted by environmental racism. Established in the Netherlands in the 1970s, the "Science Shop" is a model for community-based participatory research now found widely throughout the European Union. Science Shops are not "shops" in the traditional sense of the word; they represent the institutionalization—typically within universities—of spaces to help create novel applied knowledge in equal partnership with organizations that lack the capacity, resources, or expertise to carry out such research independently. SS4CR will adopt this model to connect community leaders and residents in Philadelphia with the educational, scientific, technical, and legal resources of NOAA, ANS, Drexel, City of Philadelphia, and other regional, state, and federal experts, as needed, in order build capacity among communities in carrying out impactful climate education, research, and policy advocacy.

PA-4
Pottstown

NOAA Office of Education - Science On a Sphere® at Montgomery County Community College.
Science On a Sphere (SOS) uses computers and video projectors to display planetary data onto a six-foot diameter sphere, analogous to a giant animated globe. Researchers at NOAA developed Science On a Sphere® as an educational tool to help illustrate Earth System science to people of all ages. Animated images of atmospheric storms, climate change, and ocean temperature can be shown on the sphere, which is used to explain complex environmental processes.

PA-6
Avondale

Office of Oceanic and Atmospheric Research (OAR) - U.S. Climate Reference Network
The US Climate Reference Network (USCRN) is an operationally viable research network of more than 138 climate stations that are deployed nationwide. Data from the USCRN are used in various climate monitoring activities and for placing current climate anomalies into an historical perspective. The USCRN provides the United States with a reference network that contributes to an International network under the auspices of the Global Climate Observing System (GCOS). ARL/ATDD manage the USCRN in partnership with NOAA's NESDIS/NCEI.

PA-7
Easton

NOAA Office of Education - Science On a Sphere® at Nurture Nature Center.
Science On a Sphere (SOS) uses computers and video projectors to display planetary data onto a six-foot diameter sphere, analogous to a giant animated globe. Researchers at NOAA developed Science On a Sphere® as an educational tool to help illustrate Earth System science to people of all ages. Animated images of atmospheric storms, climate change, and ocean temperature can be shown on the sphere, which is used to explain complex environmental processes.

Northampton

NOAA Office of Education - Environmental Literacy Program
The Environmental Literacy Program (ELP), administered by NOAA's Office of Education, provides grants and support for formal (K-12) and informal education to advance the agency's mission. In Pennsylvania, ELP funded a project by the Nurture Nature Center in Northampton County. The project aims to build collective environmental literacy and address current and future environmental hazards related to climate change. This approach brings together a wide range of potential agents of change: community-based organizations, artists, students, educators, municipalities, libraries, and residents. Building on the CREATE Resilience project, which began in 2018 and was also funded by NOAA ELP, CREATE Connections focuses on climate action plans (CAPs) recently adopted in two local cities (Easton and Bethlehem, PA) and seeks to build social capital, connectedness, and community resilience through a multi-pronged educational approach..

PA-10
Harrisburg

NOAA Office of Education - Science On a Sphere® at Whitaker Center.
Science On a Sphere (SOS) uses computers and video projectors to display planetary data onto a six-foot diameter sphere, analogous to a giant animated globe. Researchers at NOAA developed Science On a Sphere® as an educational tool to help illustrate Earth System science to people of all ages. Animated images of atmospheric storms, climate change, and ocean temperature can be shown on the sphere, which is used to explain complex environmental processes.

PA-12

Pittsburgh

National Weather Service (NWS) - Weather Forecast Office

Located in Moon Township, this NWS Weather Forecast Office (WFO) is staffed around the clock every day, and provides the best possible weather, water, and climate forecasts and warnings to residents of western Pennsylvania, east central Ohio, northern West Virginia, and western Maryland. Highly trained forecasters issue warnings and forecasts for events, including severe thunderstorms, tornadoes, winter storms, floods, and heat waves. This essential information is provided to the general public, media, emergency management and law enforcement officials, the aviation and marine communities, agricultural interests, businesses, and others. Information is disseminated in many ways, including through dedicated government channels, satellite, the Internet, and NOAA Weather Radio All Hazards.

Forecasters also provide Impact-based Decision-Support Services (IDSS), both remote and onsite, during critical emergencies, such as wildfires, floods, chemical spills, and for major recovery efforts such as those following the Joplin and Moore tornadoes, Hurricanes Katrina and Sandy, and the Sept. 11, 2001, terrorist attacks in New York City and Washington D.C. The WFO collects and disseminates precipitation, river, and rainfall data, and prepares local climatological data. Each WFO has a Warning Coordination Meteorologist who actively conducts outreach and educational programs, which helps build strong working relationships with local partners in emergency management, government, the media and academic communities. The WFO operates Automated Surface Observing Stations (ASOS), as well as the local Doppler Weather Radar, which provides critical information about current weather conditions. The radar data enables forecasters to issue warnings for tornadoes, severe thunderstorms, and flash floods.

PA-15

State College

National Weather Service (NWS) - River Forecast Center

Co-located with the NWS Weather Forecast Office on the campus of the Pennsylvania State University in State College, the Middle Atlantic River Forecast Center (RFC) performs continuous river basin modeling and provides hydrologic forecast and guidance products for rivers and streams in central and eastern Pennsylvania, all of New Jersey and Delaware, southern New York, western Maryland, and parts of Virginia and West Virginia. These products include forecasts of river stage and flow, probabilistic river forecasts, reservoir inflow forecasts, gridded precipitation estimates and forecasts, spring flood outlooks, and flash flood and headwater guidance. Some of the RFCs in the western and central U.S. also provide water supply forecasts. RFCs work closely with local, state and federal water management agencies, including the U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, and U.S. Geological Survey, to provide water and flood information for critical decisions (aka Impact-based Decision-Support Services or IDSS).

National Weather Service (NWS) - Weather Forecast Office

Co-located with the NWS Middle Atlantic River Forecast Center on the campus of the Pennsylvania State University, this NWS Weather Forecast Office (WFO) in State College, is staffed around the clock every day, and provides the best possible weather, water, and climate forecasts and warnings to residents of central Pennsylvania. Highly trained forecasters issue warnings and forecasts for events, including severe thunderstorms, tornadoes, winter storms, floods, and heat waves. This essential information is provided to the general public, media, emergency management and law enforcement officials, the aviation and marine communities, agricultural interests, businesses, and others. Information is disseminated in many ways, including through dedicated government channels, satellite, the Internet, and NOAA Weather Radio All Hazards.

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Office of Oceanic and Atmospheric Research (OAR) - National Trends Network
A NOAA Air Resources Laboratory National Trends Network (NTN) site is located at Penn State, PA. The site has been in operation since 1992 collecting data on major ions in precipitation (rain, snow) on a daily basis and from 1976 on an event basis. Chemistry data collected include: sulfate, nitrate, phosphorus, pH, ammonium, sodium, chloride, and magnesium and potassium. Since 2019, samples have been collected on a weekly basis and sent to the National Atmospheric Deposition Program (NADP) Analytical Laboratory for analysis, data entry, verification and screening.

Office of Oceanic and Atmospheric Research (OAR) - Surface Radiation Measurement Network
The Global Monitoring Laboratory (GML) operates seven stations as part of its surface radiation budget network (SURFRAD). The station measurements support regional and global weather and climate research with accurate, continuous, long-term measurements of the surface radiation budget over the United States. Solar radiation is the driving energy for geophysical and biological processes that control weather and affect planetary life; understanding the global surface energy budget is therefore key to understanding climate and the environmental consequences to agriculture and other statewide concerns. Because it is impractical to cover the whole earth with monitoring stations, the answer to global coverage lies in reliable satellite-based observations. Accurate and precise ground-based measurements across a range of climate regions are essential to refine and verify the satellite observations. These ground-based measurements also support special research projects on radiation and climate processes in the Pennsylvania region and serve as important verification for weather forecasts.

Great Lakes

National Ocean Service (NOS) – Bipartisan Infrastructure Law
The Bipartisan Infrastructure Law is helping coastal communities build the future they want to see. The legislation provides a historic investment in coastal protection and restoration that will increase community resilience to climate change and extreme weather events, and improve how we manage our ocean resources. Projects funded under this law protect and restore ecologically significant habitats, including conserving lands that play a critical role in helping communities become more resilient to natural hazards. Pennsylvania received funding in FY22 to build the state's capacity to protect its coastal communities and resources.

National Ocean Service (NOS) – National Coastal Zone Management Program
Through a unique federal-state partnership, NOAA's Office for Coastal Management works with the Pennsylvania Department of Environmental Protection to implement the National Coastal Zone Management Program in Pennsylvania. NOAA provides the state coastal management program with financial and technical assistance to further the goals of the

Coastal Zone Management Act and ensure coastal waters and lands are used in a balanced way to support jobs, reduce use conflicts, and sustain natural resources.

National Ocean Service (NOS) – Digital Coast
The Digital Coast is a focused information resource developed to meet the unique needs of coastal communities. Developed and maintained by NOAA's Office for Coastal Management, content comes from hundreds of organizations, including federal, state, and local agencies, plus private sector and non-profit contributors. The Digital Coast website provides not only site-specific coastal data, but also related tools, training, and information needed to make these data useful for coastal decision makers. The Digital Coast Act authorizes the Digital Coast as a standing national program and supports NOAA's efforts to increase access to authoritative data, tools, and training that enable coastal communities to plan for long-term resilience, manage water resources, and respond to emergencies.

National Ocean Service (NOS) – National Coastal Resilience Fund
The National Coastal Resilience Fund restores, increases, and strengthens natural infrastructure to protect coastal communities while also enhancing habitats for fish and wildlife. The National Fish and Wildlife Foundation (NFWF) executes this program in partnership with NOAA to invest in conservation projects that restore or expand natural features, such as coastal marshes and wetlands, dune and beach systems, oyster and coral reefs, forests, coastal rivers and floodplains, and barrier islands, which minimize the impacts of storms and other naturally occurring events on nearby communities. In Pennsylvania, five projects have been funded: one in FY18, two in FY21, and two in FY23.

National Ocean Service (NOS) - Office for Coastal Management
The NOAA Office for Coastal Management practices a partner-based, boots-on-the ground regional approach to coastal management, with staff available in the eight regions. Assistance is provided to local, state, and regional coastal resource management and ocean planning efforts. Constituent feedback and assessments are an important part of the effort. In addition to Silver Spring, MD, Mid-Atlantic and Great Lakes staff are located in Annapolis, MD, York, PA, and Albany, NY.

National Ocean Service (NOS) – OR&R Great Lakes Environmental Response Management Application and Response Tools for Oil and Chemical Spills
Assessing important spatial information and designing successful restoration projects rely upon interpreting and mapping geographic information, including the location, duration, and impacts from oil spills, other hazardous materials, or debris released into the environment. Great Lakes Environmental Response Management Application (ERMA®) is an online mapping tool that integrates both static and real-time data, such as ship locations, weather, and ocean currents, providing an easy-to-use common operating picture for environmental responders and decision makers. In addition to ERMA, the Office of Response and Restoration (OR&R) offers a suite of tools to support emergency responders dealing with oil and chemical spills. From Environmental Sensitivity Index (ESI) maps and data which provide concise summaries of coastal resources including biological resources and sensitive shorelines to GNOME, a trajectory and fate model that predicts the route and weathering of pollutants spilled on water, and so much more, these tools provide easy-access to critical data that support a wide range of needs for emergency responders, ultimately supporting our coastal communities.

National Ocean Service (NOS) - Marine Debris Projects and Partnerships in Pennsylvania
The NOAA Marine Debris Program (MDP) in the Office of Response and Restoration (OR&R) leads national and international efforts to reduce the impacts of marine debris. The program supports marine debris removal, prevention, and research projects in partnership with state and local agencies, tribes, non-governmental organizations, academia, and industry. The MDP Great Lakes Regional Coordinator supports coordination efforts with regional stakeholders, provides support to grant-funded projects, tracks progress of projects, and conducts regional marine debris outreach to local

audiences. The MDP also works with local communities and organizations to prevent marine debris. The Great Lakes Marine Debris Action Plan was published in 2020. This plan, which is facilitated by the MDP and supported by local stakeholders, provides a road map for strategic progress in making the Great Lakes, its coasts, people, and wildlife free from the impacts of marine debris.

National Ocean Service (NOS) - Phytoplankton Monitoring Network
The Phytoplankton Monitoring Network (PMN) is a nationwide community-based volunteer program of citizen scientists monitoring for the presence of organisms that can lead to Harmful Algal Bloom (HAB) formation. Volunteers serve as data collectors for marine and freshwater blooms at more than 200 coastal and inland sites in the U.S. and Caribbean. Monitoring is conducted year-round and volunteers are trained to measure salinity, air and water temperatures, and how to collect phytoplankton samples using a plankton net. Samples are then analyzed for any HAB organisms via microscopy. Data collected by PMN volunteers enhances the Nation's ability to respond to and manage the growing threat posed by HABs by collecting important data for species composition and distribution in coastal and freshwater environments and creating working relationships between volunteers and professional marine biotoxin researchers. Event monitoring can assist state and federal agencies to issue timely warnings about shellfish consumption and other public health concerns.

National Ocean Service (NOS) - U.S. Integrated Ocean Observing System (Great Lakes Observing System)
The U.S. Integrated Ocean Observing System, or IOOS®, is a federally and regionally coordinated observing system with 17 interagency and 11 regional partners. The System addresses regional and national needs for coastal, ocean, and Great Lakes data and information. This includes gathering and disseminating regional observations; data management; modeling and analysis; education and outreach; and research and development. Working with government agencies, academic researchers, tribes, first nations and the private sector, the Great Lakes Observing System (GLOS) provides end-to-end services that support science, policy, management and industry in the U.S. and Canada. GLOS provides public access to critical, real-time and historical data and information about the Great Lakes, St. Lawrence River and interconnecting waterways for use in managing, safeguarding and understanding these immensely valuable freshwater resources.

National Ocean Service - National Marine Sanctuary Nominations
NOAA has determined that the Lake Erie Quadrangle sanctuary nomination has successfully met the national significance criteria and management considerations described in the sanctuary nomination process. The area under consideration by NOAA for national marine sanctuary designation may be selected for designation, but being on the inventory does not guarantee that the nominated area will become a sanctuary.

National Ocean Service (NOS) – Treasures of NOAA's Ark (traveling exhibit)
The Treasures of NOAA's Ark traveling exhibit showcases an array of heritage artifacts which tell the story of how the people, technology and resources shaped NOAA and its predecessor agencies over the past two decades. NOAA's responsibilities include preserving, protecting and promoting its own heritage while at the same time sharing this history with the public through innovative programs. From 19th century maps to nautical charts and early scientific instruments, the exhibit recalls NOAA's proud heritage and legacy of service by exploring the themes of history, weather, navigation and fisheries to better understand the land, sea and sky. With a blend of art and science, there is something of interest for everyone. The exhibit will be hosted by the Erie Maritime Museum from May 8, 2024 - May 4, 2025.

National Marine Fisheries Service (NMFS) and National Ocean Service (NOS) - Chesapeake and Great Lakes Bay Watershed Education and Training Programs

The NOAA Bay Watershed Education and Training (B-WET) program is a competitive grants program that provides funding for locally relevant environmental education projects for K-12 audiences. The NOAA Chesapeake Bay Office, a division of NOAA Fisheries' Office of Habitat Conservation, administers B-WET grants for the Chesapeake Bay watershed on behalf of the NOAA Office of Education. The Great Lakes B-WET program is managed by NOAA's Thunder Bay National Marine Sanctuary on behalf of NOAA's Office of Education. The B-WET program recognizes that knowledge and commitment built from firsthand experience, especially in the context of one's community and culture, is essential for achieving environmental stewardship. Chesapeake and Great Lakes B-WET regional grant competitions are responsive to local education and environmental priorities and are supportive of partnerships between school districts and community organizations and institutions that are run by and/or serve marginalized groups, particularly minority communities. The Chesapeake B-WET program offers school district implementation grants, which are available to school districts with 25% or more landmass in the Chesapeake Bay watershed, annually and state-level capacity building grants are typically available on an every-other-year basis. The Great Lakes B-WET program offers grants for projects that serve an audience that is primarily located within the Great Lakes watershed. Capacity building grants, when offered, may serve state-wide audiences in addition to those within the Great Lakes watershed. Please see the funding opportunities for specifics.

National Marine Fisheries Service (NMFS) - Greater Atlantic Regional Fisheries Office and Northeast Fisheries Science Center

NMFS is responsible for the management, conservation and protection of living marine resources within the United States' Exclusive Economic Zone (water three to 200 miles offshore). Using the tools provided by the *Magnuson-Stevens Act*, NMFS assesses and predicts the status of fish stocks, develops and ensures compliance with fisheries regulations, restores and protects habitat and works to reduce wasteful fishing practices, and promotes sustainable fisheries. Under the *Marine Mammal Protection Act* and the *Endangered Species Act*, NMFS recovers protected marine species (e.g. whales, turtles).

The Greater Atlantic Regional Fisheries Office (located in Gloucester, MA) includes divisions that promote sustainable fisheries, habitat conservation, and recovery of protected species, and conducts statistical analysis and programs supporting these divisions. Key fish species managed in the Greater Atlantic Region include the northeast "multispecies complex" (cod, haddock, yellowtail flounder etc.), Atlantic sea scallops, herring, lobster, and summer flounder. Key marine endangered species in this region are North Atlantic right whales, leatherback, loggerhead, and Kemp's ridley sea turtles, Atlantic salmon and Atlantic and shortnose sturgeon. NMFS is the lead agency coordinating the Large Whale and Sea Turtle Disentanglement Program activities and the Marine Mammal Health and Stranding Response Program activities. The core functions of these programs include coordinating volunteer networks to: respond to entanglements and strandings, investigate mortality events, and conduct biomonitoring, tissue/serum banking, and analytical quality assurance. The Office also fosters sustainable aquaculture in the region, with two Regional Aquaculture Coordinators that act as a liaison between federal and state agencies to assist in permitting and coordination activities, supporting aquaculture outreach and education, and collaborating with industry, academia and other stakeholders on regional marine aquaculture issues.

The Northeast Science Center (headquartered in Woods Hole, MA) focuses on collection, analysis, and presentation of scientific information about the Northeast Shelf ecosystem, its condition, and its marine life. In addition to its five laboratories, the Center uses four research vessels to support its work. They are: the NOAA ships *Henry B. Bigelow*, and the small research vessels *Gloria Michelle*, *Victor Loosanoff*, and *Nauvoo*. The Greater Atlantic Regional Fisheries Office and the Science Center are responsible for the District of Columbia and the following states: Maine, New Hampshire,

Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina; and the inland states of Vermont, Minnesota, Michigan, Wisconsin, Illinois, Indiana, Ohio, and West Virginia.

National Marine Fisheries Service (NMFS) - Restoration Center
The NOAA Restoration Center, within the Office of Habitat Conservation, works with partners across the nation to restore habitat to sustain fisheries, recover protected species, and maintain resilient coastal ecosystems and communities. We have over 30 years conducting habitat restoration through competitive funding opportunities and technical assistance. We also work to reverse habitat damage from disasters like oil spills, ship groundings, and severe storms. The Restoration Center works with private and public partners in Pennsylvania to restore tidal wetlands, construct fish ladders, remove dams, modify culverts to improve tidal flushing in coastal wetlands, and remove invasive species for the benefit of managed fisheries and protected species. See the interactive Restoration Atlas to find habitat restoration projects near you. Site visits to see habitat projects may be available in Pennsylvania, please inquire if interested.

In addition, the Office of Habitat Conservation is responsible for executing an unprecedented $1.4 billion in funding under Bipartisan Infrastructure Law and Inflation Reduction Act for habitat restoration and fish passage. We are working with our partners to do this through our expert technical assistance and four funding competitions: Fish Passage, Tribal Fish Passage, Transformational Habitat Restoration, and Habitat Restoration for Tribes and Underserved Communities. We have funded 214 awards totaling $985M in rounds one and two with more to come in round 3. We are funding work all over the country, explore them on our interactive map.

National Marine Fisheries Service (NMFS), National Ocean Service (NOS), and NOAA General Counsel - Damage Assessment, Remediation, and Restoration Program
NOAA's Damage Assessment, Remediation, and Restoration Program (DARRP) assesses and restores habitat, fisheries, protected species, and recreational uses that have been harmed by oil spills, chemical releases, and ship groundings. Working with federal, state, and tribal entities, and responsible parties, we have recovered funding from responsible parties for restoration of critical habitats, fisheries, protected species, and recreational uses nationwide. These projects promote recovery of the ecosystem and provide economic benefits from tourism, recreation, green jobs, coastal resiliency, property values, and quality of life. Pennsylvania is a co-trustee with NOAA for assessment and restoration after pollution incidents in Pennsylvania. For more information about our work in Pennsylvania, visit: DARRP in Your State (and use the top menu to navigate to "Pennsylvania") and this interactive map.

National Ocean Service (NOS) - Regional Geodetic Advisor
The Regional Geodetic Advisor is a National Ocean Service (NOS) employee that resides in a region and serves as a liaison between the National Geodetic Survey (NGS) and its public, academic and private sector constituents within their assigned region. NGS has a Regional Geodetic Advisor stationed in Columbus, Ohio serving the Appalachian region including Pennsylvania. The Geodetic Advisor provides training, guidance and assistance to constituents managing geospatial activities that are tied to the National Spatial Reference System (NSRS), the framework and coordinate system for all positioning activities in the Nation. The Geodetic Advisor serves as a subject matter expert in geodesy and regional geodetic issues, collaborating internally across NOS and NOAA to ensure that all regional geospatial activities are properly referenced to the NSRS.

National Ocean Service (NOS) - OR&R Preparedness, Response, and Restoration Coordinators
NOAA's Office of Response and Restoration (OR&R) is a center of expertise in preparing for, evaluating, and responding to threats to coastal environments, including oil and chemical spills, releases from hazardous waste sites, disasters, and

marine debris. To fulfill its mission of protecting and restoring NOAA trust resources, OR&R provides scientific and technical support to prepare for and respond to environmental threats that coastal communities face; determines damage to natural resources from those releases; protects and restores marine and coastal ecosystems; and works with coastal communities to address critical local and regional coastal challenges.

Eleven regionally based **Scientific Support Coordinators (SSC)** harness the input of a multi-disciplinary team to address issues such as oil slick trajectory forecasting, environmental tradeoffs, best practices, resources at risk, and chemical hazard assessment to reduce risks to coastal habitats and resources. The SSCs for Pennsylvania are based in Point Pleasant, New Jersey at the USCG Station Manasquan, Mobile, Alabama at NOAA's Gulf of Mexico Disaster Response Center; and Ann Arbor, Michigan at the NOAA Great Lakes Environmental Research Laboratory.

OR&R identifies and quantifies environmental injury caused by releases of oil and hazardous materials. Our network of **Regional Resource Coordinators** work with multidisciplinary scientific, economic, and legal teams with the goal of securing the appropriate amount and type of restoration required to restore injured NOAA trust resources and compensate the public for their lost use. We collaborate with NMFS Restoration Center and NOAA General Council through the Damage Assessment, Remediation, and Restoration Program (DARRP) to ensure the process is efficient, legally defensible and restoration focused. The RRCs serving the Northeast/Great Lakes region are based in Boston, Massachusetts and New York, New York.

National Ocean Service (NOS) - OR&R Atlantic Environmental Response Management Application and Response Tools for Oil and Chemical Spills
Assessing important spatial information and designing successful restoration projects rely upon interpreting and mapping geographic information, including the location, duration, and impacts from oil spills, other hazardous materials, or debris released into the environment. Atlantic Environmental Response Management Application (ERMA®) is an online mapping tool that integrates both static and real-time data, such as ship locations, weather, and ocean currents, providing an easy-to-use common operating picture for environmental responders and decision makers. In the fall of 2012, Atlantic ERMA was employed as the Common Operational Picture for the U.S. Coast Guard's pollution response to Hurricane Sandy in New York and New Jersey waters. In addition to ERMA, the Office of Response and Restoration (OR&R) offers a suite of tools to support emergency responders dealing with oil and chemical spills. From Environmental Sensitivity Index (ESI) maps and data which provide concise summaries of coastal resources including biological resources and sensitive shorelines to GNOME, a trajectory and fate model that predicts the route and weathering of pollutants spilled on water, and so much more, these tools provide easy-access to critical data that support a wide range of needs for emergency responders, ultimately supporting our coastal communities.

National Ocean Service (NOS) - NOAA Ocean Guardian Youth Ambassador Program
Youth aged 13-18 from across the United States and its territories that are committed to ocean conservation and stewardship of our blue planet can apply to become a NOAA Ocean Guardian Youth Ambassador. This year-long program looks for enthusiastic youth with new ideas and a unique perspective who want to learn more about America's underwater treasures and share their passion with others. Youth learn how to become a leader at their school or in their local community to make a difference in the conservation of the ocean through marine protected areas.

National Ocean Service (NOS) - Students for Zero Waste Week
Students are inviting their local communities to "Go Green and Think Blue" by joining them in the annual *Students for Zero Waste Week campaign*. During this campaign led by the Office of National Marine Sanctuaries, students focus on reducing land-based waste in order to protect the health of local marine environments. These young leaders are raising awareness of how single-use plastic and other types of litter affect the health of local watersheds, national marine

sanctuaries, and the ocean. In addition, some schools are looking at ways to reduce their energy use on campus with hopes of raising awareness of how the burning of fossil fuels also impacts the health of the ocean.

National Weather Service - **NEXRAD (WSR-88D) Systems**
NEXRAD is used to warn the people of the United States about dangerous weather and its location. This radar technology allows meteorologists to warn the public to take shelter with more notice than ever before. The NEXRAD network provides significant improvements in severe weather and flash flood warnings, air traffic safety, flow control for air traffic, resource protection at military bases, and management of water, agriculture, forest, and snow removal. NEXRAD radar has a range of up to 250 nautical miles, and can provide information about wind speed and direction, as well as the location, size, and shape of precipitation. There are 159 operational NEXRAD radar systems deployed throughout the United States and overseas, of which two are in Pennsylvania.

National Weather Service (NWS) - Automated Surface Observing Systems Stations
The Automated Surface Observing Systems (ASOS) program is a joint effort of the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). ASOS serves as the Nation's primary surface weather observing network. ASOS is designed to support weather forecast activities and aviation operations and, at the same time, support the needs of the meteorological, hydrological, and climatological research communities. ASOS works non-stop, updating observations every minute, 24 hours a day, every day of the year observing basic weather elements, such as cloud cover, precipitation, wind, sea level pressure, and conditions, such as rain, snow, freezing rain, thunderstorms, and fog. There are 23 ASOS stations in Pennsylvania.

National Weather Service (NWS) - Cooperative Observer Program Sites
The National Weather Service (NWS) Cooperative Observer Program (COOP) is truly the Nation's weather and climate observing network of, by and for the people. More than 10,000 volunteers take observations on farms, in urban and suburban areas, National Parks, seashores, and mountaintops. The data are representative of where people live, work and play. The COOP was formally created in 1890 under the NWS Organic Act to provide observational meteorological data, usually consisting of daily maximum and minimum temperatures, snowfall, and 24-hour precipitation totals, required to define the climate of the United States and to help measure long-term climate changes, and to provide observational meteorological data in near real-time to support forecast, warning and other public service programs of the NWS. The data are also used by other federal (including the Department of Homeland Security), state and local entities, as well as private companies (such as the energy and insurance industries). In some cases, the data are used to make billions of dollars' worth of decisions. There are 167 COOP sites in Pennsylvania.

National Weather Service (NWS) - NOAA Weather Radio All Hazards Transmitters
NOAA Weather Radio All Hazards (NWR) is a nationwide network of radio stations broadcasting continuous weather information directly from the nearest National Weather Service (NWS) forecast office. NWR broadcasts official NWS warnings, watches, forecasts and other hazard information 24 hours a day, 7 days a week. Working with the Federal Communication Commission's (FCC) Emergency Alert System, NWR is an "All Hazards" radio network, making it the single source for comprehensive weather and emergency information. In conjunction with federal, state, and local emergency managers and other public officials, NWR also broadcasts warning and post-event information for all types of hazards – including natural, environmental, and public safety. Known as the "Voice of NOAA's National Weather Service," NWR is provided as a public service by the NWS. NWR includes 1,100 transmitters covering all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories. There are 21 NWR transmitters in Pennsylvania.

Office of Oceanic and Atmospheric Research (OAR) – Pennsylvania Sea Grant College Program
The National Sea Grant College Program (Sea Grant) is a federal-university partnership administered by NOAA that integrates research, extension outreach, and education. Sea Grant forms a national network of 33 programs in all U.S. coastal and Great Lakes states, Puerto Rico, and Guam. Pennsylvania Sea Grant promotes the ecological and economic sustainability of Pennsylvania's coastal resources through science-based research, education, and extension programs. Major Geographic Focus Areas include the Lake Erie, Delaware River, and Susquehanna River watersheds. By supporting focused applied research projects, Pennsylvania Sea Grant provides stakeholders with accurate scientific information to help them make informed decisions dealing with such topics as: land-use planning, nutrient loading, harmful algal blooms, aquatic invasive species, fish health, climate adaptation, emerging pollutants, smallmouth bass mortality, and coastal community and economic development. Administrative offices are located in Erie, PA. Get involved with Sea Grant through state and national opportunities like the John A. Knauss Marine Policy Fellowship program at seagrant.noaa.gov.

Office of Oceanic and Atmospheric Research (OAR) - Sustained Carbonate Chemistry Observation Moorings
The Carbonate Chemistry Observing Mooring network is a sustained investment in ocean chemistry observing networks in U.S. waters and abroad. There are currently 19 buoys in coastal, open-ocean and coral reef waters that contribute to this network. The time series created from these moorings are key to understanding how ocean chemistry is changing over time in these ecosystems by providing continuous and long-term observations of ocean conditions. These buoys are seated in three locations in Alaska (Gulf of Alaska, Papa, Bering Sea), two in California (California Current Ecosystem 1 & 2), one in the Chesapeake Bay (DE, MD, NY, PA, VA, WV), Coastal Mississippi (MS), Florida (Cheeca Rocks), Georgia (Grays Reef), Oregon (Newport Hydrographic Line), Maine (Gulf of Maine), and Washington (Cha'ba in La Push).

Delaware River and Bay Districts

National Ocean Service (NOS) - Delaware River and Bay PORTS®
A Physical Oceanographic Real-Time System (PORTS®) is operated cooperatively with the local maritime community along the Delaware Bay and River at which real-time data are quality-controlled and disseminated to local users for safe and efficient navigation. Real-time data are available for water levels from eleven stations, meteorological data from eleven locations, tidal current data from two locations, and air gap measurements from bridges at three locations. .

Delaware Bay and Great Lakes Districts

National Ocean Service (NOS) - Navigation Manager
Office of Coast Survey navigation managers are strategically located in U.S. coastal areas to provide regional support to federal and state agencies in order to assist with navigational challenges. NOAA's navigation managers work directly with pilots, port authorities, and recreational boating organizations in Pennsylvania. They help identify the navigational challenges facing marine transportation in Pennsylvania and provide NOAA's resources and services that promote safe and efficient navigation. Navigation managers are on call to provide expertise and NOAA navigation response coordination in case of severe coastal weather events or other marine emergencies. The Office of Coast Survey has a navigation manager in Norfolk, VA to support mariners and stakeholders in the Mid-Atlantic region. The Great Lakes Navigation Manager position is currently vacant. However, the Office of Coast Survey has an acting Navigation Manager located in Silver Spring, MD to support mariners and stakeholders in Great Lakes waters.

National Ocean Service (NOS) - Navigation Response Team
The Office of Coast Survey (OCS) maintains the nation's nautical charts and publications for U.S. coasts and the Great Lakes. The Office of Coast Survey's Navigation Response Branch (NRB) conducts routine and emergency hydrographic surveys; and working with the regional Navigation Managers, navigation response teams (NRT) work around-the-clock

after storms and other navigation emergencies to speed the reopening of ports and waterways. During emergency response, the NRTs provide time-sensitive information to the U.S. Coast Guard or port officials, and transmit data to NOAA cartographers for updating Coast Survey's suite of navigational charts. NRT-New London is assigned to New London, CT and is able to respond within 24 to 48 hours. The mobile integrated response team (MIST) kit is available to the Great Lakes that can be used on a vessel of opportunity and staffed by NRT members.

Bipartisan Infrastructure Law (BIL) / Inflation Reduction Act (IRA) Projects

The National Oceanic and Atmospheric Administration (NOAA) was entrusted with billions of supplemental federal funding dollars with passage of the Bipartisan Infrastructure Law on November 15, 2021 and the Inflation Reduction Act on August 16, 2022. This historic infrastructure funding has been invested in communities across the nation to build resilience in the face of climate change. NOAA distributed funding to communities, tribal, state and local governments, higher education programs, businesses, non-profit organizations, and facilities in need. NOAA funded billions of dollars in grants and cooperative agreements across the country to fund projects that enhance climate resilience, restore coastal and marine habitats, improve safety, and create jobs. For an interactive map of NOAA BIL and IRA investments in your state, visit https://www.noaa.gov/bil-ira-awards-explorer.

BIL

Improving Engagement Methods for Coastal Resilience and Reducing Climate Risk: Bridging Learning Networks From the Urban Northeast (CCRUN) to the US Caribbean (CCAN), $499,836

This proposal is a partnership between NOAA CAP/RISA's, Consortium for Climate Risk in the Urban Northeast (CCRUN), and Caribbean Climate Adaptation Network (CCAN). This partnership will allow for important knowledge transfer and collaborative research concerned with improving community engagement methods for coastal resilience and climate risk reduction. Through cross-regional co-production of knowledge about coastal climate risk and resilience in highly vulnerable communities, we will analyze, compare and improve community engagement approaches. *This award supports work in MA, NJ, PR, VI, PA*

Infrastructure Investments in the Great Lakes Observing System, $1,836,000

The Great Lakes Observing System will support improving and enhancing observing systems in the Great Lakes. The funding will be used to recapitalize and modernize systems to address sustained monitoring of coastal conditions. Project work will address critical assets and services, including repairs, replacements, and spares to enhance resilience of the observing system and product delivery services to prevent failures. As the IOOS RA in the Great Lakes and ROP equivalent, GLOS will support the sharing and integration of Federal and non-Federal data. The funding will be used to sustain and enhance data accessibility in the regions through data product development, portal management, and outreach and engagement with stakeholders. *This award supports work in MI, MN, NY, WI, IN, IL, OH, PA*

Coastal and Inland Flood and Inundation Mapping, $516,946

To improve predictions of future flood events, Cooperative Institute for Great Lakes Research (CIGLR) will expand on an existing forecast framework and develop improved flood forecasting for the Great Lakes by coupling the lake forecast hydrodynamic model of the lake with the National Water Model (NWM) distributed hydrologic model, and the WAVEWATCH III wind wave model. The team will begin implementing Great Lakes Coastal Forecasting System (GLCFS) improvements starting with Lake Ontario, including developing and testing FVCOM-NWM and FVCOM-WAVEWATCH III

coupling and support for real-time inundation mapping, which is needed for public safety. *This award supports work in MI, WI, IL, IN, OH, PA, NY, MN*

Infrastructure Investment and Jobs Acts (IIJA): Development of Next Generation Prediction System for Great Lakes Water Levels and Lake Management Decisions, $1,444,946
This project aims to develop the next-generation prediction system for determining the mean and extreme net basin supply and water levels to provide the foundation for defining risks of coastal inundation impacts and lake management decisions across subseasonal to annual time scales for the Great Lakes. *This award supports work in MI, WI, IL, IN, OH, PA, NY, MN*

BIL Supplemental: Development of Next Generation Prediction System for Great Lakes Water Levels and Lake Management Decisions, $1,745,237
The project aims to develop the next-generation prediction system for determining the mean and extreme net basin supply and water levels to provide the foundation for defining risks of coastal inundation impacts and lake management decisions across subseasonal to annual time scales for the Great Lakes. *This award supports work in MI, WI, IL, IN, OH, PA, NY, MN*

BIL Supplemental: Coastal and Inland Flood and Inundation Mapping, $487,892
To improve predictions of future flood events, we will expand on an existing forecast framework and develop improved flood forecasting for the Great Lakes by coupling the lake forecast hydrodynamic model of the lake with the National Water Model (NWM) distributed hydrologic model, and the WAVEWATCH III wind wave model. We will begin implementing hydrodynamic modeling improvements starting with Lake Ontario. *This award supports work in MI, WI, IL, IN, OH, PA, NY, MN*

BIL - NOAA WI Shipwreck Coast NMS Observing System Support and Enhancement, $55,455
The Wisconsin Shipwreck Coast National Marine Sanctuary (WSCNMS) received funding to install three Sofar Ocean Technologies smartmoorings within the sanctuary, which transmit via satellite real-time wave, wind and water column temperature information that directly benefits a variety of lake users including charter and commercial fishers, recreational boaters, NWS marine forecasters, and researchers. The project substantially expanded the Great Lakes observing network by deploying new assets in areas that were previously poorly observed and where data was needed to serve stakeholder and lake research needs. This award provides continuing engineering data management, and operational support for the existing smart mooring systems and enhances the original project with additional physical science sensors. *This award supports work in MN, WI, MI, IL, IN, OH, PA, NY*

Implementation of the CZM Infrastructure Investment and Jobs Act funding for program capacity building, $450,000
This funding will build the capacity of the state's federally-approved coastal management program within PA Department of Environmental Protection (DEP) to plan for and implement habitat restoration and conservation projects proposed through funding opportunities connected to the Bipartisan Infrastructure Law. Specifically, the DEP will use these funds to work in partnership with a contractor who will act as an Infrastructure Project Coordinator that will develop guidance and an application process for PA's annual competition. The Project Coordinator will work with Coastal Management Program (CMP) as well as key stakeholders including CMP's Coastal Zone Advisory Committee, networked state agencies, the Lake Erie Coastal Zone Advisory Committee, among others.

Philadelphia Marine Debris Action Coalition, $300,000
To address existing knowledge gaps in terrestrial microplastic contamination, this project will perform an assessment of microplastics in the six watersheds present in and around the Philadelphia and Delaware Counties region of the Upper Delaware Estuary Zone.. The key outcomes of this project will be a greater scientific understanding of the presence of microplastic debris in the Greater Philadelphia Region as part of a newly formed Marine Debris Action Coalition. This research will support the generation of a heatmap of terrestrial microplastic contamination in the targeted region that will directly inform planning and remediation recommendations made by the new Coalition.

IRA

Modular Ocean Model (MOM6) Development for the Great Lakes, $224,730
The proposed work is a new task of NOAA Climate Ecosystem and Fisheries Initiative (CEFI) for regional application: Great Lakes. This project provides a rare opportunity for GLERL and the Cooperative Institute for Great Lakes Research (CIGLR) to develop an ensemble modeling framework (i.e., GLESM + MOM6) to inform and support ecosystem and fisheries management in the Great Lakes. While GLESM is a strong Earth system model, additional guidance provided by MOM6 and the broader NOAA-GFDL suite can only serve to improve our Earth system forecasts. *This award supports work in MN, WI, IL, IN, MI, OH, PA, NY*

Inflation Reduction Act (IRA) Climate Ready Fisheries Funding, $1,426,875
The Mid-Atlantic Fishery Management Council (MAFMC) will use funding to evaluate existing challenges and identify potential management strategies within the context of a changing climate and the discard implications due to changing stock distributions and fishing fleet behavior. Proposed activities will improve areas within existing programs, policies, and practices that contribute to bottlenecks or inefficiencies during the development of a fishery management action and enhance the Council's capabilities to respond to the systemic challenges posed by changing climate to our process. *This award supports work in NY, NJ, PA, DE, MD, VA, NC*

Multi-decadal projections of extratropical cyclones and their associated extreme precipitation, snowfall, and surface winds, $41,171
During the cool season, severe Extratropical Cyclones (ETCs) and their associated fronts can produce hazardous weather events that include heavy rain, snow, and strong winds. Such EventsSuchevents lead to significant losses of human life and property and account for many of the billion dollar weather and climate related disasters. The goal of this work is to use three global climate model large-ensembles (GCM-LEs) produced by U.S. modeling centers to develop near-to-long term projections for ETCs and their storm-scale extremes.

Building Ecological and Community Resilience Through the Floodplain Restoration of Lower Darby Creek at John Heinz National Wildlife Refuge, $9,500,000
This project will restore the Lower Darby Creek wetland complex in John Heinz National Wildlife Refuge, an urban wildlife refuge located in Philadelphia. They will provide habitat for numerous species that depend on wetlands by increasing tidal connectivity to the 150-acre Henderson Marsh. They will also complete design and permitting to reintroduce a natural tide into an adjacent man-made impoundment. Installation and improvement of a kayak launch, observation tower, interpretive signage, and the surrounding trail system will expand opportunities for the local community to access and experience these natural areas.

Implementation of the CZM Inflation Reduction Act funding for Lake Erie bluff recession monitoring, $376,000
This funding will build the ability of the Commonwealth’s federally-approved coastal management program within the Pennsylvania Department of Environmental Protection (DEP) to implement projects, initiatives, and programs that

increase the climate resilience of coastal communities within coastal counties. Specifically, the DEP will use these funds to acquire updated lidar and orthoimagery along Lake Erie to evaluate bluff recession and update the Bluff Recession Hazard Areas to help the Pennsylvania Coastal Resources Management Program and local communities make data-driven, accurate decisions for bluff management.

FloodWise: Autonomous Geotagging for Disaster Response, $174,747
RESILIFT will develop the Residential Lifting Safety Sensor System (RLS3), a house-lifting technology offering accessible flood mitigation for homeowners. With 14.6 million properties in the 100-year floodplain facing a 26% risk of flooding, effective structural lifting is essential. Current methods are inefficient and hazardous. Our goals include developing a prototype, testing the RLS3, and assessing market feasibility. This project aims to improve community preparedness and shift to mitigative retrofits, targeting a $1.168 trillion market and exploring financing for homeowners and 400,000 U.S. home-building businesses.

A Multi-University Consortium for Advanced Data Assimilation Research and Education (CADRE), $1,197,199
The next-gen NOAA Unified Forecast System Data Assimilation (DA) faces significant challenges associated with earth system modeling and observations. Serious gaps in DA inhibit addressing these challenges. A Multi-University Consortium for Advanced Data Assimilation Research and Education will partner closely with NOAA to advance DA education and research. Supported will be 12 DA research thrusts and their implementation to the UFS. The projects will deliver improvements to DA, the workforce, and improve short range to S2S forecasts.