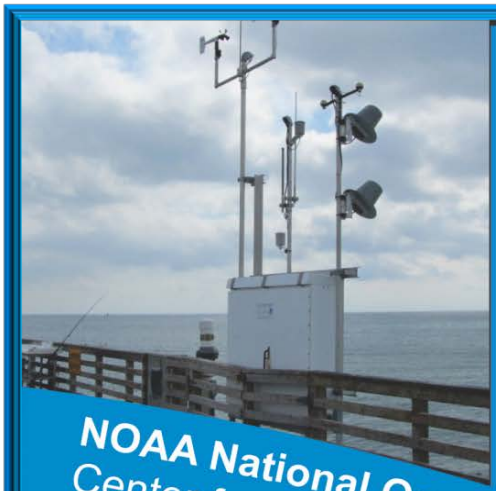
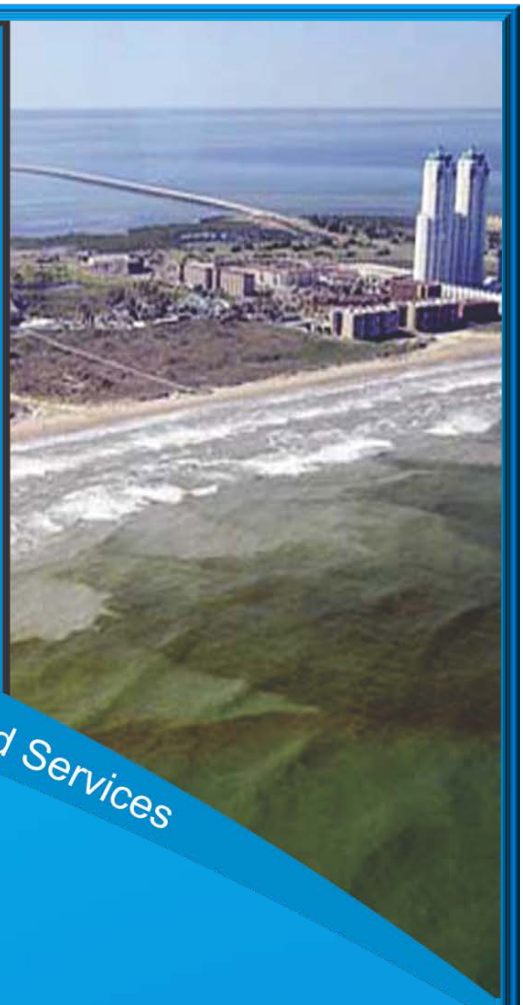




NOAA National Ocean Service
Center for Operational Oceanographic Products and Services

Strategic Plan
2015-2019

Turning Operational Oceanographic Data
Into Meaningful Information For The Nation

Message from the Director

The Center for Operational Oceanographic Products and Services (CO-OPS) is a unique scientific organization that collects and disseminates reliable and accurate oceanographic and meteorological data for a wide spectrum of users. Our robust and innovative observing systems deliver a constantly evolving suite of real-time, forecast, and trends products. The demand for our products and services continues to grow each year. Maritime commerce is expanding at exponential rates and demands more precise and accurate data for decision support. Our coastal communities are increasingly threatened by coastal hazards and long-term sea level changes; they need quality information and tools to plan for a resilient future.

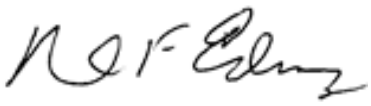
We take great pride in our rich history of supporting the National Oceanic and Atmospheric Administration's (NOAA's) mission of science, service, and stewardship. Our dynamic and experienced staff of scientists, engineers, and technicians carries out our core mission to be a reliable center of expertise for coastal physical oceanography, continually providing critical information to busy ports and monitoring threatening storm surges and tsunamis. Delivering our broad array of products with a high level of customer service is a strong driver for us.

Our *Leadership Team* emphasizes strategic planning and adopting new and innovative technologies to respond to increasing demand for oceanographic information. While our program is largely focused on day-to-day operations to deliver a steady stream of highly valuable products and services, we are poised to seize opportunities to make new investments in strategic directions, whether they are well-established paths or new avenues. Many of these opportunities will build on existing partnerships; others will require new ones to be formed, as both are force multipliers.

The *CO-OPS Strategic Plan* is the result of a structured planning process. The plan focuses us on completing key ongoing projects, while recognizing new opportunities for projects over the next five years. The plan sets forth a vision for our role in NOAA's Ocean Service *Position America for the Future* by providing the Nation's coastal observing network and suite of information products needed to address the economic, environmental, and societal needs of the most populated area of the country—our coasts.

We will encourage, attract, and facilitate the partnerships needed to set this vision in motion. The *Strategic Plan* serves as a forward-looking framework for our annual planning process each fiscal year. I am excited to watch our progress and celebrate the successes as we reach our strategic goals in the coming years.

Thank you for your support,



Richard Edwing
Director, Center for Operational Oceanographic Products and Services

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Who We Are

For over 200 years, NOAA's Center for Operational Oceanographic Products and Services (CO-OPS) and its predecessors have gathered oceanographic data along our Nation's coasts. Technological advances have enabled us to turn those data into meaningful information that is vital to protecting life, property, and the environment, while also contributing to our National economy.

Our baseline data are the foundation for a sound geospatial infrastructure, which is critical for enabling water levels to be accurately vertically referenced along our coasts and the Great Lakes. CO-OPS is the legal authority for computing and updating tidal and Great Lakes datums, including *mean sea level*. Our real-time oceanographic data and other products, such as tidal current predictions, promote safe and efficient navigation. We operate and maintain physical oceanographic observing systems designed to operate reliably along our dynamic coasts. These systems continually collect information about tides and water levels, currents, meteorology, and other environmental parameters, which in turn serves as the springboard for our products and services designed to meet a wide range of customers' needs.

Three core CO-OPS programs focus on and serve specific customers and user communities—Mapping and Charting Services, Maritime Services, and Coastal Oceanographic Applications and Services of Tides and Lakes (COASTAL).

- The **Mapping and Charting Services Program** focuses on the Nation's vertical reference system. CO-OPS calculates tidal and Great Lakes datums utilizing data collected from the National Water Level Observation Network (NWLON), comprised of more than 200 long-term permanent stations, and other subordinate stations. The program provides specialized products and services to NOAA's Office of Coast Survey and National Geodetic Survey to support bathymetric and shoreline mapping surveys. We also install and operate short-term water level stations to support a variety of other programs, such as marine boundary determinations, U.S. Army Corps of Engineers coastal projects, and the VDatum program.

- The **Maritime Services Program** concentrates on providing products that support the needs of the maritime community for safe and efficient navigation. CO-OPS gathers and disseminates real time data via a variety of media, which we also transform into products that mariners need to navigate safely, such as predictions and nowcast/forecasts of water levels, currents, salinity, and meteorological parameters (e.g., winds, atmospheric pressure, and air and water temperatures). We have also added two new parameters, visibility and waves, to our suite of sensors offered through the partnership-based Physical Oceanographic Real-Time System (PORTS®) to provide additional information crucial to safe navigation.

- The **COASTAL Program** leverages CO-OPS rich data holdings, observing systems, and oceanographic expertise to better serve non-traditional, non-navigational applications. The program specifically supports specialized products for ecosystem restoration, coastal hazard mitigation, ecological forecasts, and climate observation and adaptation. These applications include coastal planning projects, marsh restoration projects, long-term sea-level assessments, storm-surge and tsunami monitoring, emergency preparedness, HAZMAT response, and Harmful Algal Bloom bulletins.

CO-OPS Vision, Mission, and Goals

Vision

Safeguarding coastal communities and supporting the Nation's economy with oceanographic information accessible by anyone, at any time, from anyplace.

Mission Statement

Our mission is to serve as the authoritative source for accurate, reliable, and timely tide, water level, current, and other oceanographic information to support safe and efficient navigation, sound ecosystem stewardship, coastal hazards preparedness and response, and the understanding of climate change.

NOAA envisions a coastal intelligence network that brings together both observing and information delivery systems to effectively serve the Nation's coastal needs. CO-OPS will play a key role in providing the foundational observing system backbone and an "on ramp" for partners to deliver information through established and emerging products and services. We will continue progress toward integrating our observing systems and will work with a broad coalition of partners to assess and support a wider range of environmental observing needs at national, regional and local levels. We will continue to facilitate access to our sophisticated data management tools and expand our ability to work with and manage different levels of data quality. We envision supporting this effort with a strong customer service ethic and investments in our human capital and information technology infrastructures.

Strategic Goals

I. Customer Service

Demonstrate a customer-centered operating model that responds to emerging customer requirements and feedback.

II. Integrated Observing System

Develop one cohesive observing system with integrated products and services that are responsive to evolving customer needs.

III. Advanced Products and Services

Continually improve and evolve CO-OPS products and services to meet customer needs and keep pace with rapid changes in requirements, technologies, and media.

IV. Human Capital and Infrastructure

Align our organization's workforce, resources, and infrastructure to consistently deliver high-quality and cost effective products and service.

Strategic Goal 1: Customer Service

Demonstrate a customer-centered operating model that responds to emerging customer requirements and feedback.

> ***"Superior customer service and strong communications are integral components of a high performing organization."***
>
> Richard Edwing, Director, CO-OPS

CO-OPS is part of a 200-year history of providing tide, water level, and current information critical for safe and efficient navigation, maritime commerce, and military readiness. Vessel operators need our accurate real-time and forecast water level and current information to safely chart their course and determine how much cargo they can safely carry. Shippers use our products to transport over $1.5 trillion in foreign imports and exports, a large piece of our Nation's economy. Customers risk the safety of their businesses, projects, vessels, cargoes, and lives because they believe our products are accurate and reliable.

As the world economy has grown, so has the need to import and export more cargo. This growth has resulted in ever-larger vessels pressing the safety limits of the channels and bridges that they must pass through and under—often with only inches of clearance. Traditional approximations of water levels no longer suffice for these mega-ships. Instead, ship operators need very accurate real-time measurements of tides, currents and bridge air gaps, along with accurate forecasts of water levels out to 72 hours.

In recent years, we have identified additional applications of CO-OPS products, beyond the traditional maritime commerce ones. Tsunami detection and warning, storm surge monitoring, sea level trends, wetland restoration, coastal resource management, and harmful algal bloom forecasts all benefit from accurate tide, water level, and currents information and forecasts.

The key to CO-OPS' success is the best possible customer service—knowing who needs our products and understanding their present and emerging requirements. Most research shows that organizations that listen to and implement customer feedback are more likely to retain those customers for future interactions.

Measures of Success:

- Contact two new organizations (representing potential customers) each year and identify their requirements.
- Increase the volume of data downloaded from the CO-OPS website by 5% or more annually.
- Exceed the Federal Government average for customer satisfaction through the use of an accredited survey.

Objective 1.1: Identify customers and understand their requirements.

CO-OPS employees seek to know as much as possible about our customers. An effective customer service strategy begins with identifying target customers – knowing who they are, what they need from our organization, and how they interact with us. We must understand their requirements on all levels—their existing and future requirements and how they are prioritized.

Actionable Strategies:

- Develop lists of common customer groups and organizations, and prioritize into target customer groups with key contacts.
- Seek out and identify non-traditional customers.
- Interact regularly with customers to validate their current requirements, identify emerging requirements, and understand evolving needs. Determine how target customers prioritize their requirements, including critical instruments/measurements, timeliness, accuracy of products and services, convenience, and reliability. Consider what is most important to customers and determine how it aligns with the mission and capability of CO-OPS.
- Understand existing and potential partners to identify opportunities for enhanced collaboration geared toward meeting greater customer needs.
- Analyze all customer requirements to identify common areas for priority development of targeted products and services.

Objective 1.2: Develop a culture of customer service.

CO-OPS will create an organizational culture of customer service. CO-OPS employees at all levels will have the tools to serve our customers well and will understand how critical their work is to our customers. They will take pride in being part of a service-oriented organization.

Actionable Strategies:

- Establish and communicate a vision for customer service excellence.
- Establish, communicate, and implement clearly defined standards for employees to follow.
- Conduct internal customer service training sessions.

Objective 1.3: Educate customers to increase utility of CO-OPS products.

CO-OPS will work to increase the knowledge, understanding, and awareness of our products. To maximize the use of CO-OPS products among populations who could benefit from them, we will

establish and conduct an education and outreach strategy to inform the public, other governmental organizations, the Administration, and Congress about the value, proper uses, and limitations of CO-OPS information. We will help to brand NOAA's Ocean Service as the Nation's coastal agency that "positions America for the future."

Actionable Strategies:

- Identify potential areas where existing customers could expand their knowledge and understanding of CO-OPS products and services; conduct targeted trainings.
- Develop an outreach strategy to reach and educate both traditional and non-traditional customers.
- Implement the strategy through an annual outreach plan supported by outreach and educational materials, including ideas for best practices.

Objective 1.4: Monitor customer satisfaction.

CO-OPS will monitor our customers' satisfaction and provide a feedback loop to incorporate customer input—positive or negative—into the planning process. We will strive to become an organization where customers expect to be more than satisfied with the quality, reliability, and the usefulness of our products and with the professionalism, knowledge, courtesy, and responsiveness of our employees.

Actionable Strategies:

- Afford customers the opportunity to evaluate the timeliness and quality of the service we provide.
- Conduct periodic formal customer satisfaction surveys through an *American Customer Service Index* mechanism.
- Make improvements based on customer feedback. Ensure that a complaint-resolution strategy supports our customer-focused vision.

Strategic Goal 2: Integrated Observing System

Develop one cohesive national observing system that facilitates collaboration with local and regional partners.

CO-OPS recognizes that it is vital to transform our existing observing systems, e.g., NWLON, the Physical Oceanographic Real-Time System (PORTS®) and the National Current Observation Program into one national coastal observing system. An integrated system will allow us to continually infuse new technology, drive national standards, and partner with other public, private, and academic observing systems to better serve the Nation. Such a system will also ensure the efficiency, effectiveness, long-term sustainability, and high quality of our observing systems, products, and services. It will establish a backbone for the Nation's coastal observing system that provides an "on-ramp" for partner systems to easily access standards and provide data toward larger regional and national missions.

This backbone can also be an operational nexus for providing other types of environmental parameters needed to address national needs such as water quality and ecological forecasting. This cohesive observing system will be a key contribution to the NOS vision for providing a coastal intelligence network that is responsive to evolving customer needs across the entire Nation's coastal regions. It will be important to establish priorities at all stages given progress will likely need to be achieved within existing resources.

Measures of Success:

- Expand integration of external (to CO-OPS) partner observing assets by at least one new partnership each year.
- Transition a minimum of 10 NWLON stations annually to microwave water level technology.
- Complete transition of real-time current meter data transmissions using the Geostationary Operational Environmental Satellite (GOES).
- Develop and implement an improved calibration system for acoustic sensors and a new calibration system for microwave radar water level sensors.
- Develop a prototype GPS water level buoy for operational offshore water level data collection in collaboration with the Office of Coast Survey and National Geodetic Survey.

Objective 2.1: Enhance and consolidate CO-OPS' physical oceanographic observing systems.

CO-OPS will become the operational nexus for coastal oceanographic and other environmental parameter measurements. We will improve and consolidate our observing systems for various oceanographic and meteorological measurements, implement new sensor technology (to improve service and reduce costs), and integrate with partner measurement systems (to increase spatial coverage). These actions will substantially

improve our observatory network so that our infrastructure becomes a platform of opportunity beyond the core parameters. We envision this integrated system to become the backbone of a national coastal observing network (see Objective 2.2) to provide continuous spatial coverage to support all coastal communities and ecosystems in the U.S.

Actionable Strategies:

- Develop and pursue a strategy to achieve a sustainable business model for all CO-OPS observing systems that enables economies of scale and streamlines the present system of numerous agreements and contracts.
- Leverage external partner observing system assets through integration of sensor technology already tested and evaluated by CO-OPS or its federal partners.
- Prioritize and fill critical gaps in the NWLON as resources become available.
- Transition to microwave water level technology as the primary water level sensor used in CO-OPS observing systems.
- Develop and implement a retrievable bubbler orifice to eliminate diving requirements at all stations being transitioned to microwave water level primary sensors.
- Fully implement improvements that enable the full transmission of current meter data over GOES to improve data reliability.
- Develop an implementation plan to fully harden NWLON stations to withstand coastal storms.
- Expand continuous Global Positioning System measurement at long-term water level stations to improve observations and understanding of global sea level, as well as local land motion.

Objective 2.2: Assess and develop an integrated national coastal observing network.

CO-OPS' consolidated observing system represents a foundational component of the Nation's coastal observing network by providing timely, accurate, and reliable physical environmental measurements. However, other mission areas such as ecological forecasting, dredging, and habitat restoration require water quality, biological, and chemical parameters not presently provided by a national observing system. CO-OPS' observing system could provide the national backbone and serve as a catalyst to help fulfill this need. Working with partners, we will assess recommendations and requirements from a broad range of sources to identify which parameters will provide the most benefit for the most customers. Coastal stakeholders require a comprehensive coastal intelligence network to fully inform a wide range of decisions, so we will assess the role our observing network can play to fulfill these needs by identifying the end-to-end enhancements required for our observing and data management systems.

Actionable Strategies:

- Work with the NOAA Integrated Ocean Observing System (IOOS) and other NOAA centers/programs, such as the National Weather Services (NWS)/National Data Buoy Center, National Marine Fisheries Service (NMFS)/Chesapeake Bay Interpretive Buoy System, NOS/National Estuarine Research Reserve System's System-Wide Monitoring Program, and others to envision and identify a path forward for a NOAA coastal observing system to serve federal missions not presently being well served by NOAA coastal observing assets or other sources.
- Assess the capability of the CO-OPS observing network (including the data management system) and partner systems to serve these missions and identify enhancements needed.
- Work with partners to identify a common set of customer-driven standards for full implementation of a comprehensive national coastal observing network.
- Identify strategic partnerships to jointly test and evaluate biological, chemical, and other oceanographic sensors required for reliable operation in dynamic environments.
- Provide CO-OPS' partners opportunities to utilize our infrastructure as a platform of opportunity for other parameters of interest.
- Foster relationships with outside organizations, such as the U.S. Geological Survey, U.S. Army Corps of Engineers, Alliance for Coastal Technology (ACT), Quality Assurance/Quality Control of Real-Time Ocean Data working group (QARTOD), Regional Associations, etc., to develop new technology, standards, and innovative methodologies.

Objective 2.3: Continually develop and infuse technology to improve and enhance operational systems.

CO-OPS will ensure the quality, efficiency, health, and sustainability of our integrated observing systems through continuous system improvements, enhancements, and infusion of new and emerging technology to our observing systems and networks.

Rapid technological change and evolving requirements from the Government, as well as our partners and customers, make it essential for us to adopt new technologies to ensure that we can sustain these integrated observing systems and capabilities in the future.

We will continue to conduct research, development, test, and evaluation (RDTE). These efforts will help us optimize our operational systems to collect and report data in the most efficient and effective way possible. These efforts will also help us explore and incorporate available and emerging technologies for our observing systems.

Actionable Strategies:

- Complete CO-OPS' test and evaluation on microwave water level sensors to expand and improve our operations, including more dynamic environments.

- Complete RDTE of new systems for improved capability to measure water levels in the Arctic, including both short-term and long-term applications.
- In partnership with Office of Coast Survey and the National Geodetic Survey, develop and transition GPS buoys to operations for offshore water level data collection.
- Complete long-term plan for the RDTE of a suite of measurement systems that will improve CO-OPS' capability to rapidly establish real-time ocean/meteorological observations in response to emergency or urgent requests.
- Develop and expand CO-OPS' water quality capability to monitor and provide data needed to protect human and ecosystem health.
- Develop the capability to derive wave observations from existing water level and current monitoring technology.
- Develop and incorporate surface buoy technology into coastal current survey and other parameters' applications.
- Update and improve CO-OPS' laboratory test and calibration facilities in accordance with ISO principles and methodologies.

Strategic Goal 3: Advanced Products and Services

Continually integrate and evolve CO-OPS products and services to meet customer needs.

One of CO-OPS' central functions is to provide accurate and timely products and services to a wide range of data users. Our core navigation customers require an ever-expanding suite of products to meet the needs of a larger and more complex marine transportation environment. Our coastal physical oceanographic information has wide application outside the navigation community as well. For example, those whose missions involve coastal monitoring and restoration, hazards mitigation, and ecosystem forecasting often employ our data and products.

Over the next five years, we will continue to advance and expand our full suite of products. We will collaborate on product development to leverage partner innovation and local knowledge, as well as to better enable their value added products. By strategically developing new in-house capabilities and leveraging partnerships with other data and technology providers, we will offer an integrated suite of products and delivery mechanisms to meet our customers' needs.

Measures of Success:

- Ensure that all NWLON real-time data products have 95% or greater availability.
- Complete transition of all water level data—either from CO-OPS' observational network or from external sources—to processing through a web-based interface.
- Deliver an integrated website product that combines NOS Operational Forecast System (OFS) and NWS forecast products with NOAA in-situ observations.
- Increase by 50% the number of locations in the Arctic with modern tidal datums, bench mark sheets, and tidal predictions.
- Increase annually the amount of partner data meeting NWLON and PORTS standards that is ingested and disseminated.
- Upgrade and operate all OFS models within *NOAA's High Performance Computing* environment.

Objective 3.1: Enhance web presence and web products.

CO-OPS will continuously provide the most effective mainstream product-dissemination service available. Through our up-to-date and expanded website, we will provide accurate and comprehensive physical oceanographic data and products in easy-to-use and customizable formats.

Actionable Strategies:

- Implement a *Next Generation* website that provides the capability for one-stop shopping for all CO-OPS products and services.
- Make geospatial (e.g., KML, JSON) formats available for all real-time data sets.

- Deliver user-customizable web pages, e.g., *My Everything*, for all CO-OPS real-time data sets that provide user-defined alert capability.
- Provide public access to real-time sensor status information for CO-OPS stations.
- Expand the utility of water level data to include the ability to reference to multiple tidal datums.
- Work with the Office of Coast Survey and the National Geodetic Survey to continue implementing and improving the web based VDATUM (i.e. improving accuracy and reducing uncertainty) tool.

Objective 3.2: Diversify products and expand support for other NOAA mission areas.

CO-OPS' continuous improvement and expansion of our suite of products is key to meeting the needs of both navigational and non-navigational customers. Our expertise in making physical oceanographic measurements and deriving meaningful products provides value to a broad range of applications for our customers and the Nation. We will leverage that value by collaborating with partners to provide observations and forecast products at a single website where customers can obtain all the oceanographic and meteorological information they need to safely navigate, receive vital storm surge information, and other information.

Actionable Strategies:

- Develop services and applications to deliver our products through mobile devices.
- Partner with the National Geodetic Survey to provide integrated products clarifying the contributions of land motion and local oceanography to relative sea level change.
- Partner with the Office of Coast Survey to supply information to create tide-aware electronic nautical charts in all locations where we operate an OFS.
- Partner with the NWS, IOOS and others to integrate their observations and forecasts into PORTS, OFS, and water level observation web pages.
- Partner with the U.S. Coast Guard to expand U.S. carriage requirements to accept non-paper-based tide and tidal current predictions.
- Provide improved tools and training to better communicate storm surge information to the public.
- Continue improvements of CO-OPS sea level trend products to support climate analysis that provides customers with a greater understanding of changing sea levels.
- Initiate activities to upgrade the International Great Lake Datum (IGLD) in 2020.

Objective 3.3: Increase available Arctic geospatial information.

CO-OPS' tide and currents products provide critical baseline information for the Arctic, which is undergoing extraordinary climate upheaval with conditions changing faster than at any time in the past 10,000 years. These changes are leading to greater use of the Arctic for marine transportation, natural resource extraction, and tourism. Climate change has also increased shoreline erosion through the effects of severe weather events during the longer ice-free season. Our baseline information will aid in safe use of the Arctic and will help map the changes that the region is experiencing.

Actionable Strategies:

- Establish the baseline Arctic datum reference system through the installation of both long-term and seasonal water level gauges.
- Increase up-to-date tide and tidal current predictions for the region.
- Support the development of VDatum grids in the Arctic.
- Provide increased access to legacy products that no longer meet CO-OPS operational standards for web-based access but can still provide value to customers.

Objective 3.4: Expand ability to ingest and disseminate data from partners.

CO-OPS will work with other federal, state, and regional organizations to develop a set of common standards for the collection and use of water level data. The policy and standards will give CO-OPS customers access to more data from our partners.

Actionable Strategies:

- Establish a multi-tiered set of standards for the collection and dissemination of tidal current and water level data.
- Establish umbrella agreements with regional partners to increase the volume of partner data ingested and disseminated.
- Incorporate National Data Buoy Center data quality control results into CO-OPS' meteorological data so that customers can assess the quality of the data.
- Ensure that all applicable PORTS systems disseminate wave data from nearby *Coastal Data Information Program* buoys.
- Integrate U.S. IOOS high frequency radar (HFR) data into the suite of navigation products and services in conjunction with PORTS products when HFR data is available.
- Coordinate with the National Geodetic Survey to directly link bench mark information from both program offices' databases.

Objective 3.5: Continue expansion of operational forecast systems (OFS) and ecological products.

Over the last ten years, CO-OPS has significantly expanded the percentage of the U.S. coastline covered by OFS hydrodynamic models. These models provide guidance for the 48-hour forecast of total water elevations and complement CO-OPS real-time data and tidal predictions. Through our expertise and leadership in providing the *Harmful Algal Bloom (HAB) Bulletins*, we have demonstrated that we are the NOS operational center of expertise for ecological forecasting. We will expand our role to meet the Nation's need for timely and accurate operational ecological forecasting products.

Actionable Strategies:

- Continue expanding OFS models to new areas and retrofitting existing models to run on NOAA's supercomputing environment using state-of-the-art community modeling techniques.
- Support use of community models for development of new modules that could be incorporated into operations, e.g., ice, hypoxia, HAB, data assimilation, etc.
- Develop the standards, criteria, and process for incorporating partner hydrodynamic model output into the CO-OPS suite of products.
- Explore the infrastructure and logistical requirements to develop ensemble modeling forecasting capability.
- Support NOAA's *Ecological Forecast Roadmap* actions to achieve a national operational HAB bulletin system.
- Continue working with NOAA to expand the utility of CO-OPS OFS to support ecological forecasting efforts in hypoxia and pathogens, along with enhancing navigational products, such as forecasting sea ice in the Great Lakes.

Strategic Goal 4: Human Capital and Infrastructure

Align the organization's human capital and infrastructure to consistently deliver high-quality products and services.

CO-OPS will successfully harness people, processes, and technology to accomplish our mission. The strength of our 200-year legacy derives from the expertise, dedication, and professionalism of our workforce. We are committed to empowering our employees so that they can excel by creating and delivering products and services that exceed customer expectations. Our culture and infrastructure will support teamwork, cooperation, and accountability.

An employee-empowered organization requires clearly defined roles and responsibilities, evolving operational guidelines, and streamlined standard operating procedures. We will continue to improve organizational effectiveness through refinement of the Reliable Operating System (ROS) and our repository of standard operating procedures and policy documents. Enhancements to the ROS will not only improve operational efficiency but also increase product and service quality through process standardization.

Information technology (IT) systems and infrastructure are key enablers of the CO-OPS mission. We are committed to the reliability and security of our IT systems and infrastructure. We will pursue technology modernization efforts that fully support the mission requirements of today, while ensuring that the IT infrastructure is secure, stable, and responsive to the needs of the future.

Measures of Success:

- Complete development and implementation of training modules for internal technical training.
- Achieve 80% utilization of CO-OPS internal training program by employees.
- Complete development and implementation of ROS Version 2.0.
- Address all IT security *Plan of Actions and Milestones* by the established due dates.
- Complete modernization of legacy IT software systems.
- Ensure authorization to operate IT systems.

Objective 4.1: Foster and sustain a culture of accountability and adaptability.

CO-OPS will ensure that our workforce continues to create high quality oceanographic products and services by helping them obtain the technical skills required to perform at increasingly higher levels. To accomplish this objective, we will focus on succession planning and new skills development.

Succession planning will ensure that corporate knowledge is passed on to future generations of CO-OPS employees so that critical skills

are not lost. Acquiring and maintaining other skill sets, such as project management and new/emerging capabilities, will enable us to deliver planned products and services in a timely manner but also to quickly adapt to new requirements.

Becoming a learning organization will ensure that we maintain core competencies, such as operational oceanography and engineering, and will improve our ability to proactively identify and respond to emergency events and emerging trends.

Actionable Strategies:

- Conduct a baseline assessment of CO-OPS workforce knowledge and skills.
- Conduct a gap analysis between present skills and future mission requirements.
- Conduct succession planning to transfer core knowledge to future generations of CO-OPS employees.
- Develop and maintain a CO-OPS education and training program.
- Build and sustain a nationally recognized core capability in operational oceanography and engineering, as well as IT architecture and engineering.
- Encourage employee participation in professional groups, on committees and boards, and at conferences.
- Develop partnerships with academic institutions and foster relationships with industry leaders for long-term training and research.
- Explore the concept of a cross-divisional applied research team.
- Continue to foster a CO-OPS culture of high performance through accountability.

Objective 4.2: Improve the Reliable Operating System.

CO-OPS is committed to implementing quality management principles that improve internal business practices, data quality, and product availability. We will assess the ROS 1.0 and make refinements that improve operational efficiency, align with approved governance, reinforce standards, and ensure delivery of quality products.

Actionable Strategies:

- Periodically investigate and evaluate CO-OPS operational practices and identify areas for improvement.
- Improve operational efficiency with new tools and refined procedures/processes.
- Provide training on the use of and enhancements to ROS.
- Institute a feedback process through which employees may propose changes or improvements to current standard operating procedures.

Objective 4.3: Improve the security and management of information technology systems and infrastructure.

CO-OPS recognizes that the success of our mission depends on the flexibility, stability, and security of our IT systems and infrastructure. Modernization of the IT infrastructure is crucial to our ability to fulfill that mission, as well as strategies and future initiatives. We will continue to improve our effectiveness and efficiencies in managing the IT infrastructure, while modernizing existing technology and developing our capacity to detect, assess, and position CO-OPS to take advantage of technology trends in accordance with DOC/NOAA/NOS policy and industry best practices.

Actionable Strategies:

- Maintain a stable, secure, and flexible IT infrastructure in accordance with the *CO-OPS IT Modernization Roadmap*.
- Develop a *CO-OPS Data Management Plan* focused on future trends and industry best practices to better support CO-OPS in maintaining a source of quality data and information.
- Continue to refine the CO-OPS IT governance process to improve efficiencies, enhance stability, and increase overall quality of CO-OPS' product delivery.
- Establish a stable, secure, and robust environment for the analysis of new advancements in tools within IT, oceanography, and marine engineering.
- Continue to participate in the NOS IT strategic planning process.

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service

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