

**National Oceanic and Atmospheric Administration
National Ocean Service
PORTS & NWLON Major Application
006-48-01-15-01-3402-00-118-062
Operational Analysis
2007**

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Executive Summary

CO-OPS Mission Statement

CO-OPS is the authoritative source for accurate, reliable, and timely tides, water levels, currents and other oceanographic information.

Our data, products and services support safe and efficient navigation, sound ecosystem stewardship, coastal hazards preparedness and response, and the understanding of climate change.

CO-OPS Vision Statement

Everyone has ready access to tide, water level, current and other coastal oceanographic information needed for informed decision-making.

The National Physical Oceanographic Real Time System (PORTS7) and NWLON (National Water Level Observation Network) Major Application ingests, quality controls, processes, analyzes, and disseminates water level, current, and meteorological observations and products based on measurements received from the oceanographic sensors installed at PORTS and NWLON locations. The application provides operationally sound observations and monitoring capabilities coupled with operational Nowcast/Forecast modeling.

This operational analysis (OA) is an annual, in-depth review of the application's performance based on the following:

- Customer Results
- Strategic and Business Results
- Financial Performance
- Innovation

This report focuses on the operational state of the application as of December 31, 2007, and is based on guidance developed by the Department of Commerce.

The PORTS and NWLON Major Application directly facilitates NOAA's Strategic Goals to:

- Support the Nation's commerce with information for safe, efficient, and environmentally sound transportation;
- Serve society's need for weather and water information;
- Protect, restore, and manage the use of coastal and ocean resources through an ecosystem approach to management; and
- Understand climate variability and change to enhance society's ability to plan and respond.

The current Major Application meets established cost, schedule, and performance parameters.

1.0 Customer Results

The PORTS and NWLON Major Application is meeting the customer's needs and is delivering the services that it intends to deliver. In 2007, the application aided users by providing water level and elevation information for successful coastal wetlands rehabilitation; continuing to provide real time data to support safe navigation at fourteen PORTS with [Mobile Bay, AL PORTS](#) becoming initially operational in May 2007; providing real time water level data to improve storm surge forecasts generated by the NWS; expanding support for the NWS Tsunami Warning Network through expansion of 60 new 1-minute water level NWLON stations and implementation for public availability of the [1-minute Water Level Data](#) web page; upgrading the [Storm Quicklook](#) suite, including its software, graphic product, web page and [Storm Quicklook Archive](#); and continuing support of the Coast Guard AIS initiative which requires all ships to carry a transponder beacon. The value and success of this application in terms of meeting customers' needs mandates a continued need for this investment. Figure 1 describes the logic model employed by the application to determine its outputs and outcomes. The application provides these documented outputs and customer focused outcomes.

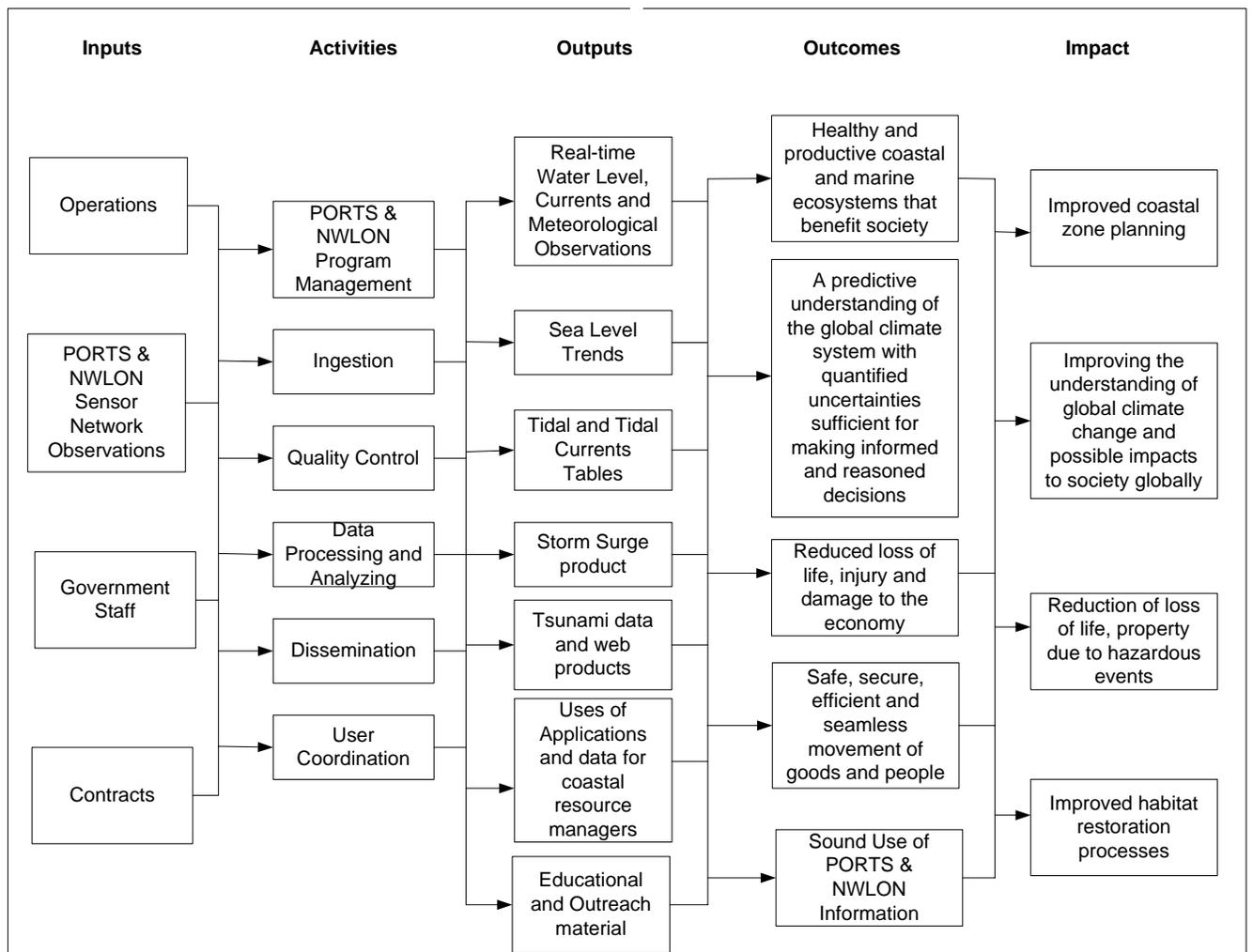


Figure 1 PORTS and NWLON Major Application Logic Model

1.1 Customer Requirements and Costs

The PORTS and NWLON application's principal customers and stakeholders are the commercial shipping industry, the US military, and government agencies responsible for search & rescue (SAR), hazardous material spill response and planning, and environmental management and the general public in coastal communities. PORTS and NWLON information, when combined with up-to-date electronic or digital nautical charts and precise global positioning data, provides the mariner with a clearer picture of the potential dangers that can threaten navigation safety. Shipping companies seeking to improve economic productivity use navigation systems aboard ships to maximize cargo load. Real-time knowledge of the currents, water levels, winds, waves, visibility, and density of the water gained through these navigation systems can decrease the turnaround time and increase the amount of cargo moved through a port and harbor by safely utilizing all available dredged channel depth. The economic benefit is significant. For example, one foot of draft accounts for between \$36,000 and \$288,000 of increased revenue per transit for vessels in Tampa Bay ([Estimating Economic Benefits from NOAA PORTS Information - A Case Study of Tampa Bay](#) July 2005). Another report for Houston/Galveston Bay PORTS suggests that a best estimate of the presently realized quantifiable economic benefit from Houston/Galveston PORTS® data is \$14.1 to \$15.6 million ([Estimating Economic Benefits from NOAA PORTS Information - A Case Study of Houston/Galveston](#) March 2007).

PORTS and NWLON information also benefits community preparedness and response during severe weather events. Timely information about coastal flooding and surf conditions can help coastal communities develop better evacuation and hazard response plans, protect lives and property, and minimize impacts to sensitive habitats. Physical characteristic data such as currents, water levels, salinity, and meteorological variables in and around waterways has been used to document freshwater inflows into sensitive saltwater habitats and minimize environmental impacts from pesticide spraying, one of many sources of non-point source pollution.

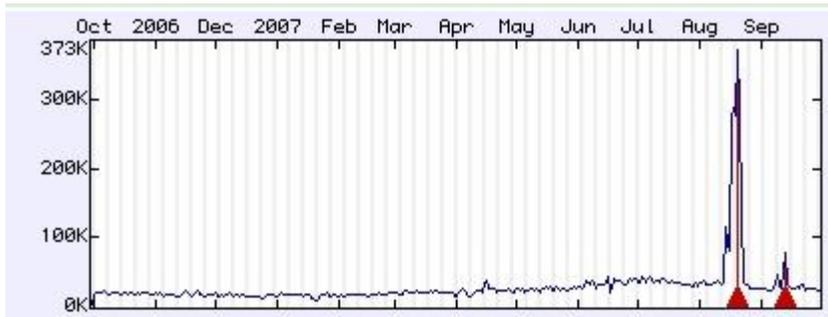
PORTS installations are customer/stakeholder driven and cost shared. Before establishing a PORTS site, requirements from customers and stakeholders are gathered, documented and agreed upon to make sure their local needs will be met. This process may involve talking with site managers, harbor masters, regional resource managers, usually those interested stakeholders that will be investing in the system. The PORTS and NWLON application works with other partners, such as the NWS Tsunami Warning Centers, the NWS Weather Forecast Offices, the OAR Office of Global Programs, and coastal estuarine managers, by providing them with timely, quality controlled real-time water level information for their programs. Working with partners helps to ensure that the best value is achieved for everyone involved.

Tidal current observations are conducted at various key locations around the nation to update tidal current predictions primarily used by mariners for safe navigation. Locations are prioritized by user feedback on locations where tidal current predictions are no longer accurate due to local bathymetric changes, the age of the original observation data and other factors. User feedback is gathered through a variety of methods ranging from outreach efforts on a local level to web based reports.

Methods used to track performance are conducting economic benefits analyses, and gathering user feedback with the customers and stakeholders at meetings, conferences, and on-site. In addition, user information can be gained from a NOAA web statistics web page for the PORTS and NWLON application ([Overview of Tides and Currents web pages](#)). These pages present the yearly number of

visits (see Figure 2). Spikes shown in the graphic in Figure could be due to the increased number of visits to the Quicklook web pages when Hurricane Humberto (9/12-13/2007) and Hurricane Dean (8/21/2007) were threatening U.S. coastal waters.

Figure 2 Number of visits for FY2007



	Visits	Bytes
Total (365.00 days)	10,308,673	3,446.3G
Daily		
Peak on 08/20/07	373,895	
Peak on 08/17/07		25,761M
Average	28,243	9,668.6M
Recent Average	26,731	11,171M
Monthly		
Average	861,410	288.0G
Recent Average	815,285	332.7G
September 2007	896,909	313.9G
August 2007	2,613,376	386.2G
July 2007	1,106,831	339.1G

1.2 Performance Measures

The PORTS and NWLON Major Application supports the customer's requirements. These measures align with the Customer Results Measurement Area within the Performance Reference Model developed by the Federal Enterprise Architecture Program Management Office (FEA-PMO). Table 1 summarizes these measures.

Table 1: Customer Results Performance Measures

Measurement Area	Indicator	2007 Baseline	2007 Actual Result	Comments
Customer Results	% of real-time data accessible via web services portal	0% of real-time data accessible	100%	To expand public data accessibility capabilities

2.0 Strategic and Business Results

The PORTS and NWLON Major Application is meeting its own goals and objectives as well as those of the agency. Program management and controls are in place to ensure the Major Application continues to meet its goals and objectives and monitor how well the PORTS and NWLON Major Application performs.

2.1 PORTS and NWLON Helps to Achieve Strategic Goals

The PORTS and NWLON Major Application directly facilitates NOAA's Strategic Goal to support the Nation's commerce with information for safe, efficient, and environmentally sound

transportation. Specifically, by providing near real-time oceanographic information, products and services to mariners, navigational safety and efficiency are improved.

In particular:

- Added a new PORTS system, includes water level, current meters, barometer pressure, water temperature, air temperature and wind sensors at Mobile Bay, AL.
- Upgraded 65 Data Collection Platforms to use the newer Xpert technology
- Added to operations an automated system, CMIST, to process currents survey data. CMIST has reduced the currents process person hours from approximately 8 hours to 20 minutes and in the past year, 156 currents meter survey stations have been processed into production.

The PORTS and NWLON Major Application helps achieve NOAA's goal to serve society's need for weather and water information by providing real time data to support emergency responders and to improve NWS forecasts for storm surge, tsunami and other hazardous events.

In particular:

- Revised the Storm Quicklook software and product
- Integrated with the Coast Guard's AIS system, they are able to pull data using web services directly into their AIS system
- Implemented public access to the 1-minute water level data web pages

The PORTS and NWLON Major Application helps achieve NOAA's goal to protect, restore, and manage the use of coastal and ocean resources through an ecosystem approach to management by providing accurate tidal datums, frequency of inundation analyses, and other tools which are used to improve how habitat restoration is planned, implanted and maintained.

In particular:

- Established two short-term water level stations through a partnership with the Elkhorn Slough, CA NERR, one of which is moved every three months to support various research goals of the NERR. These water level data are directly supporting restoration, biomonitoring, sea level study, and hydrodynamic modeling efforts.
- Established a long-term tide station at the Weeks Bay NERR in Alabama through the NOS Storm Surge Partnership Project to support monitoring and research in the NERRS as well as NOAA sea level, storm surge, and modeling efforts in Florida and Alabama.

The PORTS and NWLON Major Application helps achieve NOAA's goal of understanding climate variability and change to enhance society's ability to plan and respond. Specifically, updating and adding new long term sea level trends support coastal zone management and long term planning for development along the coast. It also aids in understanding the state of the climate system.

In particular:

- Worked with the Climate Program Office to install backup water level sensors for specific Pacific stations
- Continued processing sea level trend data for global stations so that they may be added to the CO-OPS [Sea Levels Online](#) web pages

- Worked with Coastal Services Center on the PRICIP project to create a climate product which includes heavy rain, strong winds and high seas for an area of interest in Pacific. These products will include sea level trend graphics.

2.2 Business Results

2.2.1 Program Management and Controls

The NWLON is statutorily authorized to collect, analyze, and disseminate data on tides pursuant to the 33rd United States Code, Sections 883a-883f established under the auspices of the Act of August 6, 1947 (61, Stat, 787). Each PORTS implementation is a partnership effort in consultation with the local harbor or waterway organizations and with the local community providing installation and operation costs and is guided by an agreement between the Federal Government and the local partner. PORTS is explicitly authorized through the Hydrographic Services Improvement Act of 1998. Through this United States Code and these agreements new requirements or enhancements to the PORTS and NWLON Major Application are driven.

A detailed baseline of anticipated activities and expenditures is provided on an annual basis which includes maintenance of operational systems as well as new development, expansion, and modernization. The baseline takes into consideration the planning contained within the various IT Plans and within the context of the IT Architecture Plan. Prior to submitting the detailed baseline for the coming year, it is checked for any course corrections that are needed using actual activities and costs from the previous year as a guide and benchmark. This plan is submitted for approval by the Director of the Center for Operational Oceanographic Products and Services (CO-OPS).

The PORTS and NWLON Major Application is managed by teams which meet on a weekly basis to discuss operational issues, including performance, cost, and scheduling concerns. A report of any relevant issues is made to senior management every week. Once a quarter, the baseline plan is reviewed. An analysis of any budget and performance level variances is conducted by the Information Systems Division, program manager(s) and budget control staff of CO-OPS. Significant variances that would keep a project from returning to the plan if not addressed and mitigated trigger management action. Although all causes of variances revealed in the analysis are addressed, technical issues, more often than not, cause unfavorable cost or schedule conditions. If technical deficiencies are found, alternatives for corrective action are considered including but not limited to redesign, scrap and remake, rework, etc. When considering these alternatives, the impact on cost and schedule is weighed in addition to the technical considerations. After an alternative is selected, it may become necessary for the PORTS and NWLON baseline plan to be adjusted. In some cases, a decision may be made to provide additional resources to the plan. Ultimately, the cost/benefit and price/performance factors are weighed in the decision making process to select the best response to any variance. What is most important is that the PORTS and NWLON application is monitored regularly, any and all variances are analyzed, and CO-OPS remains vigilant in refusing to address variances by simply increasing the budget, assigning more staff or extending the schedule.

2.2.2 Monitoring Cost, Schedule and Performance

Cost – Every quarter the Deputy Director meets with each Division Chief to review the quarterly budget. Monthly reports are submitted by contractors to their respective contracting Officer's Representatives (CORs) to ensure contracts are within cost and on schedule. Tools used for budget

tracking (i.e. planning and execution) are CAMS (Commerce Administrative Management System), COAST (Coastal Ocean Automated System for Tracking), and AAP (Advanced Acquisition Plan). In FY2008, use of COAST will transition to using the Management Analysis and Reporting System (MARS).

Schedule – Microsoft Project is used to track various technical components, critical tasks and milestones of the PORTS and NWLON application. This software tool integrates the scope of work to be conducted with schedule and personnel resource elements for optimum project planning and control. Microsoft Excel is used to track cost components of the PORTS and NWLON application. This software tool tracks monthly spending, both planned and actual, for any IT-related costs. Accounting codes dedicated to IT are used.

Performance – The PORTS and NWLON application contribute to a number of corporate milestones and performance measures associated with a number of NOAA programs. Quad charts are generated on a quarterly basis to provide execution details regarding the performance parameters, schedule, budget, and any key risks that arise. This information is reported by the Program Manager of the Marine Transportation System Program, a component of NOAA's Commerce and Transportation Strategic Goal. The Program Manager reviews this information to ensure consistency with agency established budgets, program goals and policies, and mission objectives and requirements.

2.3 Reviews

A comprehensive review and assessment of the current information architecture for the PORTS and NWLON Application was performed by a consulting contract with Northrop Grumman in FY2003. The assessment noted two distinct data flows, a PORTS data flow and a NWLON data flow. It found that these two data flows sufficiently supported the original goals of PORTS and NWLON when each was an individual program, but that the capacity to leverage the information available through both data flows as they exist now in an attempt to meet the increasing information needs of the business requirements of today since the merger of the two programs is severely limited. It was therefore recommended that the capacity of the current information architecture be restructured to better accommodate the business user requirements that span both data flows. Based on the assessment, a decision was made to proceed with the recommended changes to the architecture. As the requirement analysis and the development of proposed solutions progressed, it became apparent that the level of effort required to complete the re-engineering of the information architecture exceeded available resources. As a result, an information architecture team was established and focused on the procurement of contract services to perform the re-engineering efforts. A 5-year contract award was made to Project Performance Corporation (PPC) in August, 2006. The scope of the re-engineering effort includes: 1) development of applications for collecting and managing inventory and field configuration information for PORTS and NWLON measurement equipment and locations; 2) development of a new database model that consolidates the water level and current metadata into a single database; 3) development of new applications to ingest, quality control, analyze, and distribute the data to simplify the processes, ensure consistent processing across all data, and support anticipated data growth; and 4) phased implementation of these changes.

2.4 Security

The PORTS and NWLON system is accredited under requirements spelled out in NOA 212-13 (03/17/03) and the DOC IT Security Program and Minimum Implementation Standards (2005) that

are based on OMB and NIST guidance. System Security Plans, Risk Assessments, and Contingency Plans were certified and approved for the PORTS and NWLON Major Application in August 2006. Management, operational, and technical security controls are adequate to ensure the confidentiality, integrity and availability of information.

All CO-OPS systems contributing to the PORTS and NWLON Major Application are scheduled to be re-certified and re-accredited by FY09. All systems are continuously monitored for security incidents by the NOAA Computer Incident Response Team (N-CIRT) and undergo quarterly vulnerability assessments and quarterly self-assessments of all security controls.

2.5 Performance Measures

The PORTS and NWLON Major Application supports the strategic and business requirements. These measures align with the Mission and Business Results, Processes and Activities, and Technology Measurement Areas within the Performance Reference Model developed by the Federal Enterprise Architecture Program Management Office (FEA-PMO). Table 2 summarizes these measures.

Table 2: Business Results Performance Measures

Measurement Area	Indicator	2007 Baseline	2007 Actual Result	Comments
Mission and Business Results	# of NWLON Stations	196 NWLON Stations	200 NWLON Stations	To expand area of coverage for which water level information can be provided
Processes and Activities	% survey water current data processed and analyzed via an automated system	0% of survey water current data processed and analyzed via an automated system	100% of survey water current data processed and analyzed via an automated system	To maximize operational effectiveness by implementing an automated system for processing and analyzing water current data collected via surveys
Technology	# of Data Collection Platforms using Xpert technology	110 Xpert Data Collection Platforms	175 Xpert Data Collection Platforms	To maximize capabilities of data collection platforms

2.6 Other

The PORTS and NWLON application has a requirement that 80% of the real-time data that it is capable of obtaining be acquired, be of good quality, and be displayed in real-time. Currently, 86.4% of real-time data is meeting these performance metrics. The application also has a requirement that 95% of the near real-time data that it is capable of obtaining be acquired, be of good quality, and be displayed in real-time. Currently, 96.9% of near real-time data is meeting these performance metrics.

3.0 Financial Performance

3.1 Current Performance vs. Baseline

The current PORTS and NWLON financial performance, as shown in Figure 2, compares the actual cost of the program compared to an annual spending plan.

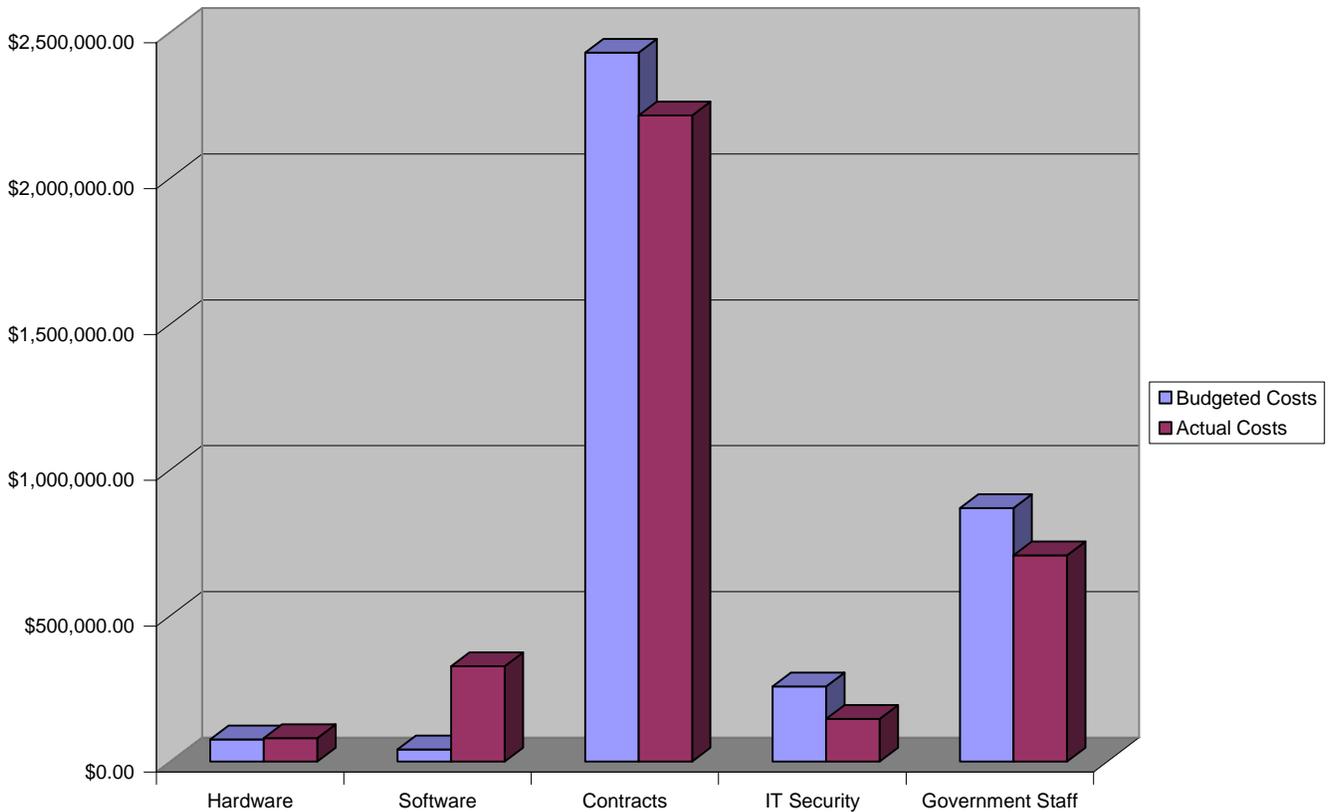


Figure 3 FY2007 Budget vs. Actual Costs

Monies were budgeted in five major areas: Hardware, Software, Contracts, IT Security and Government Staff. The deviation in software was the result of making two significant Sybase database software purchases in FY2007 that were originally planned for FY2008. The decision to make these purchases in FY2007 allowed CO-OPS to meet Internet Access Licensing requirements recently instituted by Sybase without having to purchase a temporary licensing solution until the planned purchases were made in FY2008. The deviation in contracts was the result of several contractors leaving the project and the months of time required to find replacements. The deviation in IT Security was the result of accomplishing much of the work with Government staff versus contracting personnel as originally planned. Finally, the deviation in Government staff was the result of difficulties in trying to fill 2 Government positions that were expected to be filled at the time the anticipated FY2007 funding requirements were documented.

3.2 Performance Measures

During the reporting year, financial performance of the PORTS and NWLON Major Application is achieved through divisional monthly reviews and quarterly reviews with the Deputy Director of CO-OPS in examining quarterly variance measurements of what was planned for in the yearly spending plans and what was actually spent. By creating spending plans prior to the beginning of each fiscal year, it is possible to track spending for each month down to the object class level. In addition, by submitting anticipated major procurements early in the planning process, it is possible to track spending more closely.

3.3 Cost Benefit Analysis

Two economic benefit reports were completed, one for Tampa Bay PORTS in 2005 and the other for Houston/Galveston Bay PORTS in 2007, which showed the economic benefits derived from each the PORTS. The reports describe the estimated benefits in terms of dollars to the extent possible, and they also describe non-quantifiable benefits.

Sources of economic benefit include:

- Greater draft allowance/increased cargo capacity and reduced transit delays for commercial maritime transportation (water level information)
- Reduced risk of groundings/collisions for maritime traffic (currents and wind information)
- Enhanced recreational use of the Bays by boaters, windsurfers, fishermen, etc. (winds, weather forecasts, and other information)
- Improved environmental/ecological planning and analysis, including hazardous material spill response

Houston/Galveston Bay PORTS economic benefit report (March 2007)

URL to report: [Estimating Economic Benefits from NOAA PORTS Information - A Case Study of Houston/Galveston](#)

The report estimates suggest that some \$11.9 million in direct annual economic benefits can be attributed to PORTS data in the Houston/Galveston area with a reasonable degree of confidence. Another \$2.2 to \$3.7 million in annual benefits are less easily traced but may be linked to PORTS; and an additional \$1.8 to \$2.8 million could potentially be realized with the full utilization of PORTS data. Thus, our best estimate of the presently realized quantifiable benefit from Houston/Galveston PORTS data is \$14.1 to \$15.6 million. This estimate is best interpreted as a lower bound on total benefits flowing from PORTS data, since not all uses of PORTS data can be quantified.

Most of these benefits are in the nature of avoided costs (increased producer surplus, or profit) for commercial operations in the Houston Ship Channel and adjacent waterways and approaches, and avoided costs or increased consumer surplus, including non-market benefits, for recreational users of Galveston Bay.

Tampa Bay PORTS economic benefit report (July 2005)

URL to report: [Estimating Economic Benefits from NOAA PORTS Information - A Case Study of Tampa Bay](#)

The report estimates suggested that \$2.4 to \$4.8 million in direct annual economic benefits can be attributed to PORTS data in the Tampa Bay area with a reasonable degree of confidence. Another \$2.2 million in annual benefits are less easily traced but may be linked to PORTS; and an additional \$2.2 million could potentially be realized with the full utilization of PORTS data. Thus, the best estimate of the 2005 realized quantifiable benefit from Tampa Bay PORTS data is \$4.4 to \$7.0 million. This estimate is best interpreted as a lower bound on total benefits flowing from PORTS data, since not all uses of PORTS data can be quantified.

Most of these benefits are in the nature of avoided costs (increased producer surplus, or profit) for commercial operations and avoided costs or increased consumer surplus, including non-market benefits, for recreational users of the Bay.

3.4 Financial Performance Review

Financial performance is typically subjected to a periodic review for reasonableness and cost efficiency. Monthly budget reviews are held with the program manager, CORs and contract managers to ensure contracts are within cost and on schedule. Quarterly budget reviews are held between the Division Chief and the Deputy Director to ensure that project spending is reasonable. Monthly reports from contractors are required to ensure the Government has the information it needs to evaluate cost performance. A detailed review of work and priorities is undertaken if cost is significantly above base lined values. Also, any necessary corrective actions are also identified and implemented.

4.0 Innovation to Meet Future Customer Needs

CO-OPS is in the process of upgrading its conference room with Video TeleConferencing capabilities to facilitate easier communication and collaboration. This provides the organization with greater flexibility and capacity for reducing travel time and costs with its field operations as well as its contracting partners. CO-OPS will soon be able to take advantage of 2 larger wall-mounted video monitors. These monitors can be used via laptop for presentations or interactive design sessions, or can be split to accommodate simultaneous presentations and video conferencing. In addition, there is a 3rd monitor in each room dedicated for sign language interpreter services. The size and resolution of the monitors will enable vastly more information to be shared with everyone. There will also be dedicated workstations with wireless keyboard and mouse, eliminating the need for in-house staff to bring their own laptops to meetings.

4.1 Number and Types of Users

The number (Figure 4) and types (Figure 5) of users continue to rise at the local, state and national levels as the importance of oceanographic information for coastal projects increases as well. Users of the PORTS and NWLON application primarily are ships underway and navigating through major U.S. harbors, U.S. Coast Guard, estuarine managers and other federal environmental agencies.

How have visitors found the site each year

Year	Visits	1 Page Visits	1 Page Visits % of Visits	Tracked Visits	Tracked Visits % of Visits	Search Visits	Search Visits % of Visits	Robot Visits	Robot Visits % of Visits
2006	1,616,067	922,998	57.11%	0	0.00%	93,352	5.78%	552,701	34.20%
2007	8,692,606	6,339,824	72.93%	0	0.00%	402,615	4.63%	3,437,741	39.55%

Figure 4 Number of visits* to the CO-OPS tidesandcurrents.noaa.gov web site

Top Level Domain	Description	% of Pages
com	Commercial, frequently U.S.	28.52%
net	Network Providers	22.61%
gov	U.S. Federal Government	19.87%
(Unknown)	Numeric IP Address	12.25%
edu	U.S. Educational Institutions	11.49%
mil	U.S. Military	3.12%
org	Organizations, mostly U.S.	0.75%

Figure 5 Types of visitors* to the CO-OPS tidesandcurrents.noaa.gov web site

*Information from [NOS Web Site Analytics and Guidance](#)

As the number and types of users increase, their demand for denser coverage, new sensors, timeliness of data and new applications also increases. These issues pose interesting challenges for the PORTS and NWLON application. Issues that will have to be addressed are:

- How best to determine areas for improved coverage?
- How to meet the regional or local marine observational needs?
- How to improve data ingestion and delivery to users in a timely manner?
- How to ensure the data is adhering to established quality control measures?

Project to Address Challenge: *Expansion of area coverage for which water level and current data is provided by installing additional PORTS and NWLON stations*

To meet user's needs, it is desired that by 2015 there will be approximately 500 NWLON station observing systems (300 stations associated with NWLON and 200 cooperative regional and local stations) and to operate and maintain PORTS services at the top 150 U.S. seaports.

The challenge in expanding the coverage of the PORTS and NWLON application is in creating partnerships with regional and local harbor or waterway organizations, with the local community and implementation partnership effort based on extensive collaboration to identify and satisfy user needs in order to improve safety and derive economic benefits. PORTS comes in a variety of sizes and configurations, each specifically designed to meet local user requirements, and to take into account very real geographic and hydrologic differences between waterways. In the past, these types of partnerships have been very successful and will be continued to be pursued. To improve the coverage of NWLON stations, efforts are currently underway to identify those areas with under-coverage (not enough sensors in an area) and over-coverage (too many water level sensors too close

together in an area). By identifying these areas, corrections can be made with local resource managers for improving coverage in an area.

Project to Address Challenge: *Expansion of on-line product suite*

Because of the speed in which it is easier to update web base software versus paper products, it will be necessary for traditional paper products, such as Tidal and Tidal Current tables and charts to be made available online. There will be challenges with bringing these paper-based products to the web in an efficient and reliable manner. In addition to bringing traditional products on line, new capabilities will be developed to allow any user to design their own PORTS and NWLON display web page that would have the data picture products that they would like to see arranged in a way they would like to view them, along with the ability to store these preferences to allow the tailored display to be rebuilt on demand. During the FY2007 plans were developed and development has begun for making Tidal and Tidal Current tables and charts to be made available online and user designed PORTS graphic web pages.

By allowing users to create their own specific web based products containing the data and graphics that fit their specific need will be an innovative area of development. To help overcome these challenges, working with new, secure web technologies and working with external partners during beta-testing of these new capabilities will help ensure the on-line products for PORTS and NWLON will meet data users' needs.

Project to Address Challenge: *Maximize capabilities of data ingestion and data storage*

Meeting the needs for rapid data ingestion and data retrieval is vital for a real time system. To overcome these challenges for the PORTS and NWLON application, separation of the ingestion and quality control processes from the data retrieval processes will improve data reliability and delivery. This will be achieved by separating a single operation database into two. One will be a dedicated operational database for performing data ingestion and quality control processes; the other will be a data warehouse database for performing data retrieval processes.

Project to Address Challenge: *Increase data available to the public that has been quality controlled*

CORMS (Continuously Operational Real-Time Monitoring System) is a manned quality control support system which provides 24 hour a day, 7 day a week quality control monitoring of real-time marine environmental data to ensure the availability and reliability of this data before application of the data by real-time users such as the maritime navigation community. Currently, CORMS performs minimal quality control checks on discrete 6-minute samples and flags these values for further investigation and action by watch standing personnel. As the amount of data being acquired in real-time has increased and the need exists for more sophisticated quality control checks to better ensure reliability, CO-OPS has embarked on the development and implementation of a new toolset for CORMS known as CORMS AI (Artificial Intelligence). CORMS AI will: 1) employ rule- and case-based logic to monitor the status of CO-OPS data acquisition and dissemination networks and perform real-time quality control on collected data; 2) notify watch standing personnel of communications outages and suspect data, and; 3) identify potential mitigating actions to correct the reported problem.

CORMS AI will greatly improve the effectiveness of the quality control process by allowing authorized users to introduce complex rules and cases against which data will be evaluated. CORMS AI will provide valuable information regarding trends in the overall health of the data and the systems that support its acquisition and dissemination. CORMS AI will also ensure more consistent actions are taken by the watch standing personnel.

4.2 New Technological Growth Areas

CO-OPS growth in new areas (National HF Radar Program, mobile devices PDAs, etc.) will require monitoring infrastructure and modeling enhancements. CO-OPS is assuming the lead for providing the NOS contribution for the operational coastal component of the U.S. Integrated Ocean Observing System (IOOS). Expanding the suite of sensors (parameters and quantity) will require a corresponding expansion in CORMS real-time quality control, commercial communications, data and information management, and product development. Expanding the number and function of operational models will require additional partnerships with both the academic and scientific consulting communities.

In addition to improving the hardware infrastructure and expanding the quality control algorithms, CO-OPS has many data offerings suited to display on PDA devices. Information such as Automated Real-Time Narrative Summaries (ARNS) for PORTS sites, tide predictions, water level observations, and more could be easily modified to display on modern consumer PDAs and cell phones. With data offerings already present on the web, minor modifications would allow CO-OPS to disseminate an entire suite of data products to mobile users in a fashion readily accessible and easy to read. The mobile market is constantly expanding: a 2006 survey by the Bureau of Labor Statistics revealed that the average US household spent nearly as much on wireless products as on land-lines and the current trends point to 2007 as being the first year when wireless spending will surpass land-line spending ([Cell Phone Spending Surpasses Land Lines - The Associated Press](#)). CO-OPS would benefit well by leveraging this ever expanding market to provide oceanographic and meteorological data to this growing segment of users.

4.3 Improving IT infrastructure

CO-OPS must maintain computational equilibrium with other IT intensive organizations. Further, the office network infrastructure must allow seamless capability to fully utilize computational capacity. CO-OPS will stay current with IT hardware and software technology in general and solicit and engage specialists in IT fields such as AI that can apply the technology to solve real world operational problems. Toward this goal, an effort is underway for improving internet connectivity between the CO-OPS field facility in Chesapeake, VA and CO-OPS Headquarters in Silver Spring, MD. Providing the field office with increased bandwidth will result in greater productivity of reviewing data outputs, troubleshooting failed sensors, and improving metadata quality.

4.4 Funding Levels

Recent trends in government spending indicate that agencies should not expect significant increases in their budgets. This, coupled with the requirement to accommodate more users and incorporate

evolving technology, will force the program to find efficiencies and to do more with the same amount of resources.

Project to Address Challenge: *Leveraging external resources*

There are countless benefits with doing business in concert with partners. Shared ownership of an activity leverages the resources (including intellect) of all partners. In addition, non-Federal partners have license to influence the legislative process. Partnerships are resource intensive. Considerable effort goes into the partnership process. CO-OPS strengthens core capabilities through additional partnership links with outside groups including private organizations. CO-OPS is a highly leveraged organization that is in the business of partnering with other parties to meet the needs of a broader user community. The strategy for the future includes building upon and enhancing the existing NOS operational infrastructure and culture which has emphasized cross-program and cross-NOAA integration. CO-OPS mission growth has been accomplished through advances in technology and outsourcing, while streamlining the number of personnel required maintaining the internal core workforce capability.

Annex A

System Interconnections/Information Sharing

System Name	Organization	Type of Interconnection	ISA/ MOU MOA	Agreement Date	FIPS 199 Category	C&A Status	Authorizing Official
NOAA6002 National Ocean Service (NOS) Messaging and Collaboration System	National Ocean Service (NOS)	General Support System; NOS Enterprise Email and Intranet Web Server System. It is a trusted connection and is located in a Government facility with both government and contractor personnel operating the IT systems. This system provides enterprise email and LDAP directory services for all NOS users. This system provides collaboration services to NOS organizations that can be in the form of web sites and/or Microsoft SharePoint sites.	NOAA6205 SLA for NOAA0200: NOAA6205 SSA for NOAA6001 (separate files from this plan)	June, 2006 (NOAA0200) July, 2006 (NOAA6001)			Elizabeth Scheffler (Chief Financial Officer)
NOAA6001 NOS Assistant Administrator/Management and Budget office (AAMB) Local Area Network (LAN)	National Ocean Service (NOS)	General Support System; Network (LAN) NOS SSMC Campus Backbone, AAMB LAN, and Secure Public Information Network (SPIN) (i.e., secure web farm network). Trusted connection. Located in a Government facility with both government and contractor personnel operating the IT systems.	NOAA6205 SLA for NOAA0200: NOAA6205 SSA for NOAA6001 (separate files from this plan)	June, 2006 (NOAA0200) July, 2006 (NOAA6001)			Elizabeth Scheffler (Chief Financial Officer)

System Name	Organization	Type of Interconnection	ISA/ MOU MOA	Agreement Date	FIPS 199 Category	C&A Status	Authorizing Official
NOAA0200 NOAA Network Operations Center (NOC)	National Oceanic and Atmospheric Administration (NOAA)	General Support System. NOAA SSMC Campus backbone operated by the NOAA NOC. Trusted connection. Located in a Government facility with both government and contractor personnel operating the IT systems. This system provides campus level infrastructure including LAN, WAN, and MAN networking, secure networking segments, and Internet access. This system provides campus level network monitoring, network management, NOAA enterprise VPN management and administration, campus level network help desk support and services.	NOAA6205 SLA for NOAA0200: NOAA6205 SSA for NOAA6001 (separate files from this plan)	June, 2006 (NOAA0200) July, 2006 (NOAA6001)			John Kyler (Acting Chief, Enterprise Network Services Division)
NOAA0100 NOAA Computer Incident Response Team (N- CIRT) Network	National Oceanic and Atmospheric Administration (NOAA)	General Support System. NOAA operated security monitoring for all Internet/Internet2 connection located in Silver Spring Metro Campus (SSMC) and NOAA wide computer incident response capabilities. Trusted connection. Located in a Government facility with both government and contractor personnel operating the IT systems. This system provides limited intrusion detection and monitoring services for NOAA networks scattered throughout the country. This system provides a centralize computer incident response support and reporting for all of NOAA.	NOAA6205 SLA for NOAA0200: NOAA6205 SSA for NOAA6001 (separate files from this plan)	June, 2006 (NOAA0200) July, 2006 (NOAA6001)			Becky Vasvary- Gaujot (Director, NOAA Office of IT Security)

System Name	Organization	Type of Interconnection	ISA/ MOU MOA	Agreement Date	FIPS 199 Category	C&A Status	Authorizing Official
NOAA0300 NOAA Message Operations Center (MOC)	National Oceanic and Atmospheric Administration (NOAA)	General Support System; NOAA Enterprise wide Messaging, LDAP Directory, and Calendar is operated by the NOAA MOC. It is a trusted connection and is located in a Government facility with government and contractor personnel operating the IT systems. This system provides NOAA wide email (as requested), LDAP Directory services, calendaring (as requested), and help desk services for supporting these functions.	NOAA6205 SLA for NOAA0200; NOAA6205 SSA for NOAA6001 (separate files from this plan)	June, 2006 (NOAA0200) July, 2006 (NOAA6001)			John Kyler (Acting Chief, Enterprise Network Services Division)
NOAA3100 Pacific Marine Environment al Laboratory Local Area Networks	NOAA/OAR Pacific Marine Environmental Laboratory (PMEL)	General Support System; Office of Oceanic and Atmospheric Research's Pacific Marine Environmental Laboratory Campus Backbone Network located in Seattle, Washington providing local campus, Internet access, and computer security monitoring. It is a trusted connection and is located in a Government facility with government and contractor personnel operating the IT systems. This system provides infrastructure and networking services to the Seattle Campus. This system provides intrusion detection and network monitoring to all organizations connected to this network.	NOAA6205 SLA for NOAA0200; NOAA6205 SSA for NOAA6001 (separate files from this plan)	June, 2006 (NOAA0200) July, 2006 (NOAA6001)			Eddie Bernard (Director, PMEL)

System Name	Organization	Type of Interconnection	ISA/ MOU MOA	Agreement Date	FIPS 199 Category	C&A Status	Authorizing Official
NOAA6201 CO-OPS Silver Spring LAN	National Ocean Service (NOS)	General Support System; CO-OPS operated LAN located in Silver Spring Metro Campus (SSMC). It is a trusted connection and is located in a Government facility with government and contractor personnel operating the IT systems. The NOAA6201 provides underlying enabling infrastructure for NOAA6205, such as user workstations for analyzing and processing data.	NOAA6205 SLA for NOAA0200: NOAA6205 SSA for NOAA6001 (separate files from this plan)	June, 2007 (NOAA0200) June, 2007 (NOAA6001)			Michael Szabados (Director, CO- OPS)
NOAA5004 Data Collection System Automatic Processing System	National Environmental Satellite and Data Information Systems (NESDIS)	General Support System; NOAA5004 receives all GOES transmissions and retransmits the data to DOMSAT sites, as well as pushes the data to NOAA8870. It is a trusted connection and is located in a Government facility with government and contractor personnel operating the IT systems.		December 31, 2003			Kathleen Kelly
NOAA8870 National Weather Service Telecommun ication Gateway	National Weather Service (NWS)	General Support System; NOAA8870 is the conduit over which all NWS data is transmitted. NOAA6205 provides water level and ancillary data to the NWS via NOAA8870. It is a trusted connection and is located in a Government facility with government and contractor personnel operating the IT systems.		December 31, 2003			Larry Curran
Verizon Internet/Back bone FTS2001	MCI	General Support System					

Annex B

The following management control processes are implemented:

Operational Monitoring – The Continuous Operational Real-time Monitoring System (CORMS), a sub-system within the PORTS and NWLON Application, is primarily intended to provide quality assurance and monitoring of sensor data before application of the data by real-time and near real-time users. It is a decision support system which provides data communications, data analysis, system monitoring and notification support to a variety of users. CORMS provides seven days a week, twenty four hours a day monitoring and quality control of sensors and data in order to insure the availability, accuracy, and quality of tide, water level, current, and other marine environmental information. CORMS is intended to identify invalid and erroneous data and information before application of the data by the real-time and near real-time users. The Center for Operational Oceanographic Products and Services (CO-OPS) is responsible for the quality of the real-time data provided to local users in support of navigational safety. The system provides 24 x 7 personnel coverage.

Weekly Status Meetings – Twice a week, the Operations Manager meets with other divisional representatives within CO-OPS to gather information of the operational readiness of the PORTS and NWLON measurement systems in the field and the components within the PORTS and NWLON application. The information provided may address issues relating to station outages, data availability, data quality control and station repair status. In addition to these meetings, the Operations Manager provides senior management with weekly briefings on the operational readiness of the PORTS and NWLON system.

Configuration Control and Management – Configuration control is the systematic process of maintaining the formally established baseline identification and regulating all changes to the baseline. Configuration control is achieved through an ordered process of proposal, evaluation, approval or disapproval, and implementation of approved changes to a configuration item (CI) after a configuration baseline has been established. Configuration control maintains the integrity and continuity of the design, engineering, and cost trade-off decisions which are recorded, communicated, and controlled. Configuration control prevents unauthorized, unnecessary, or marginal changes, while expediting the approval and implementation of those that offer significant benefits. Changes to the CO-OPS baseline is monitored and implemented by the groups and policies listed: CO-OPS Web Committee (CWC), Software Configuration Control, Configuration Audits and Reviews, Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA). Depending on the size and complexity of the system under control, other audits may be conducted to help ensure complete traceability of the requirement throughout the life cycle.

Configuration and Management (CM) is applied over the life cycle of a product (hardware and software) and provides visibility and control of its performance and functional and physical attributes. CM verifies that a product performs as intended and is identified and documented in sufficient detail to support its projected life cycle. Implementation of CM procedures and guidance is done in such a way as to complement other CO-OPS processes already established such as the planning and financial processes; systems integration management (SIM); and operational systems and technical architecture developments. The CM which is followed is the Department of Energy's Systems Engineering Methodology.

Project Process Improvements – CO-OPS is implementing a new process to facilitate the use of standard processes in the development and operation of applications such as the PORTS and NWLON application. This new process is called the Reliable Operating System (ROS). It is the roadmap for operating with a systematic approach to continue CO-OPS' long tradition of providing critical products and services. The ROS provides checks and balances as well as clearly defines roles and responsibilities. It supports wise decision-making and efficient use of scarce federal resources. Most importantly it ensures:

- Systems that deliver products on time and within budget
- Systems that deliver consistently accurate data
- Systems that work as designed
- Systems that work upon installation
- Systems that operate at a high level of performance
- Systems that operate with a minimum of unscheduled repairs

To assist in implementing the ROS, this past fiscal year, a major effort was put forth in finding, updating, categorizing and publishing documents related to the PORTS and NWLON application from station reconnaissance, sensor installation, data ingestion, decoding, and quality control to data product outputs.

Monthly Budget Reviews – Monthly budget reviews are held with Division Chiefs, product managers, project managers and CORs to ensure products and their associated projects are within budget and on schedule. Monthly reports from contractors and their project managers are required to ensure that the Government is receiving the information and deliverables as stated in the contracts helps the Government with cost performance evaluations.

Quarterly Organizational Budget Reviews – Quarterly budget reviews are held between the organizational budget manager and the Division Chiefs to ensure that each division is meeting their quarterly objectives, their projects are on time and within costs and to identify any resources that may or may not be needed.