

January 25, 2012

MEMORANDUM FOR: Michael C. O'Hargan
Chief, Field Operations Division (FOD)

FROM: Richard F. Edwing
Director, Center for Operational Oceanographic Products and
Services (CO-OPS)

SUBJECT: 2012 Project Instructions – Coastal and Great Lakes Water Level
Station Components

The enclosed document, "Project Instructions: Installation, and Maintenance of Coastal and Great Lakes Water Level Stations for 2012," is forwarded for implementation.

These Project Instructions are technical requirements and are provided in three parts. PART A, General Requirements, and PART B, Standing Project Instructions for the Coastal and Great Lakes Water Level Stations, Updated August 2011 are applicable to all stations. PART C, Specific Requirements, addresses NWLON and subordinate station project support, specific categories of priority work, and individual station requirements. These instructions apply to both the coastal "sea level" and Great Lakes water level stations.

PART B, the Standing Project Instructions, provides general requirements essential for maintenance of station integrity and the collection of high quality data for the Water Level Program. Standing Project Instructions document the program standards to which the data is collected. Adherence to these standards is very important for accomplishing CO-OPS' goals. The products derived from the NWLON stations are used for NOS multi-purpose applications such as PORTS[®], tsunami detection and notification, control for hydrographic and photogrammetric surveys, long-term sea level analysis and trends, boundary determinations, etc.

The Standing Project Instructions cannot take into account the dynamic year-to-year changing budget situations in CO-OPS, and when operational decisions have to be made because of the lack of budget, FOD shall consult the Engineering Division.

These instructions apply to all types of stations that are installed, maintained, or removed by CO-OPS or CO-OPS' Indefinite Delivery Indefinite Quantity (IDIQ) contractors. The requirements are explicit; available resources throughout the year will govern actual accomplishments at each station.

This year CO-OPS has made a decision to not perform the annual inspections for the Great Lakes NWLON stations because of the reduced budget and travel ceiling. So even though the station specific requirements are listed for the Great Lakes NWLON Stations in the Section 2.15 of the PART C of the Project Instructions, they will not be carried out. The station specific requirements for the Great Lakes Stations are documented in PART C so that requirements can be captured for the development of next year's Project Instructions.

Prior to scheduling of each field trip, FOD and OET will hold a pre-inspection meeting and customized station specific requirements for each station will be discussed, agreed, and performed. The agreed upon station specific instructions will be documented. This modified procedure is applicable only to FOD maintained stations.

PARTS A and C provide background information and list individual station requirements. An Excel file, 2012 Station Operational Lists, has been prepared to identify stations supporting various programs such as PORTS[®], Operational Forecast Systems (OFS), Continuous Operating Reference Systems (CORS), climate/sea level, hydro, international treaties, tsunami/storm surge, or ecosystem restoration. The list also groups the stations according to the NOAA mission goals they support. Counters are provided at the end of the list to indicate the number of stations supporting each type of project as well as the groupings of NOAA mission goals.

The specific requirements for each station in PART C, Section 2.0 have been prioritized in descending order of importance. Field personnel will accomplish as many of the requirements as possible based on the order listed in PART C, Section 2.0.

In an effort to standardize the requirements for all of CO-OPS field efforts, and to ensure that the critical information is verified immediately by OET, submissions of the draft site report (e-site report when available) and level abstract within one working day requirement applies to all annual maintenance and emergency maintenance activities for FOD and contractors. The draft site report will indicate if these requirements have been completed. Final documentation shall be submitted to OET within 30 calendar days of completion of annual maintenance and leveling for stations maintained by IDIQ contractors and within 30 days of completion of a trip for stations maintained by FOD. This year onwards requirements for a chartlet and a bench mark sketch are combined into one document called bench mark diagram.

OET will evaluate the station package (final documentation) and then inform the person or appropriate party who submitted the documentation of any corrective actions.

OET will provide FOD and contractors bench mark stability reports that indicate which marks were not leveled the previous year, as an aid to help ensure that all marks are leveled every two years. The reports are available on the network server at K:\5-Station_Archive_Files\2012 Documentation\2012 Stability Analysis for those who have access to CO-OPS' secure network. Task Managers should provide the reports to their IDIQ contractors, or OET will supply the report upon request.

FOD should update the planned monthly schedule of stations to visit and work to be accomplished based upon the maintenance requirements specified in PART C, Section 2.0, and the best use of their available resources. CO-OPS has set operational goals of 150 annual inspections in FY 2012; monthly accomplishments towards these goals will be tracked and reported to CO-OPS management. The CO-OPS field activities calendars on the new Google calendar shall be continually updated by assigned team leaders and contract task managers.

Enclosures

cc:

All CO-OPS Personnel



CY 2012 Combined Project Instructions for Coastal and Great Lakes Water Level Stations

January 2012

Engineering Division
Center for Operational Oceanographic Products and Services
National Ocean Service
National Oceanic and Atmospheric Administration

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PART A: GENERAL REQUIREMENTS

These project instructions provide the requirements for installation, maintenance, and removal of water level stations in the National Ocean Service (NOS) National Water Level Observation Network (NWLON), Physical Oceanographic Real Time Systems[®] (PORTS[®]), Coastal Oceanographic Applications and Services of Tides and Lakes (COASTAL) Program, Hydrographic and Photogrammetric Survey Operations, and reimbursable special projects. These stations provide critical data to support the following activities: ensure safe navigation; determine tidal datums for the National Nautical Charting Program; determine the baseline from which marine boundaries are delineated; determine flow rates to support International treaties; National Weather Service tsunami/storm surge warning programs; coastal resource restoration and management; and long-term sea level trend analyses. The NWLON supports the following four NOAA Mission Goals: Climate Adaptation and Mitigation; Weather Ready Nation; Resilient Coastal Communities and Economies; and Healthy Oceans. These goals are directly supported by observing systems, research and development, and modeling. The objective of the CO-OPS data collection effort is to acquire continuous, reliable, defect-free data that can be efficiently analyzed, and ensure that multi-purpose water level products are developed.

1. General Maintenance Guidance

1.1. Operational Maintenance Decision-Making Support

All NWLON and other subordinate water level and met stations support a variety of NOAA mission goals and projects. It is emphasized that the ultimate goal is to collect high quality data from all stations and sensors continuously. The establishment of new, or relocation of existing stations, will also be assigned the appropriate importance each year. Changes in priority may occur and will be at the direction of the Director of CO-OPS.

These instructions apply to all types of stations that are installed, maintained, or removed by CO-OPS or CO-OPS' Indefinite Delivery Indefinite Quantity (IDIQ) contractors. The requirements are explicit; available resources throughout the year will govern actual accomplishments at each station.

A listing of stations and the programs they support, such as PORTS[®], hydrographic and photogrammetric surveys, treaties, tsunami, or ecosystem restoration, climate/sea level, are provided in the attached file, 2012 Station Operational Lists.xls. Counters are provided at the bottom of the list to indicate the number of stations supporting each type of project as well as the groupings of NOAA mission goals. The following provides a brief overview of the four main NOAA mission goals supported by NWLON coastal water level stations. Some of the NWLON stations are supporting multiple program categories.

- **Mission Goal 1: Resilient Coastal Communities and Economies**

Stations supporting PORTS[®] activities, Hydrographic and Photogrammetric survey control activities, navigation safety, treaties, other stations supporting reimbursable and special projects, and station supporting coastal hazard resilience and climate adaptation.

- **Mission Goal 2: Weather Ready Nation**
Stations supporting NOAA Tsunami program, NOAA Storm Surge program, and NOAA Coastal Storms Program.
- **Mission Goal 3: Climate Adaptation and Mitigation**
Stations supporting various climate monitoring programs, climate adaptation activities, and stations supporting special projects
- **Mission Goal 4: Healthy Oceans**
Stations supporting ecosystem restoration projects

There are 34 stations identified as critical for Climate (GLOSS program) Monitoring, 33 of which are NWLON. Bermuda is the 34th station, and is both a Global Sea Level station and a Tsunami-Capable station, but not a part of the NWLON.

1.2. Maintenance Requirements and Reference Document

Water level station standard annual maintenance shall be accomplished in accordance with the Standing Project Instructions for the Coastal and Great Lakes Water Level Stations, Updated August 2011 , and specific station requirements in PART C, Section 2. All other applicable reference documents are provided in the Standing Project Instructions, Section 2.1. There are no maintenance requirements for stations where the funding is not identified, or not appropriated to perform the annual maintenance, or the annual maintenance is not required for some other reason.

Maintenance for reimbursable special projects shall be performed in accordance with their respective agreements, and all associated travel and supplies shall be charged to the appropriate reimbursable task numbers as approved in the project spending plans.

1.3. Field Operations Division (FOD) Maintenance

It is the responsibility of FOD to assess available resources and perform annual and emergency maintenance at any station with operational problems to restore the site to full operational capabilities with a minimum loss of data. FOD shall consult with the Engineering Division (ED), as necessary, when making operational decisions, planning annual inspections, or emergency maintenance activities. The ED Chesapeake Instrument Lab (CIL) and Seattle Instrument Lab (SIL) will coordinate with FOD to provide additional emergency maintenance support as needed.

The weekly Data Management and Assessment Team (DMAT) meeting will review any station problems of concern, and the Operations Manager shall provide direction should multiple problems compete for available resources.

There are many online resources available to field and HQ personnel to assist in the evaluation of station and sensor status. A few of the more useful resources are provided in the following table.

Online IP Address	Description of Resource
https://corms.nos.noaa.gov/ccp/	CORMS Control Panel – status of primary and ancillary sensors (not backup sensor)
http://extranet.co-ops.nos.noaa.gov/mambo/index.php	CO-OPS Extranet panel
http://extranet.co-ops.nos.noaa.gov/cgi-bin/diag_diagnostics.cgi	Diagnostic single station plotting tool, for checking the configuration of a station, or for checking the status of satellite transmissions
http://extranet.co-ops.nos.noaa.gov/invalid/	Invalid sensor report – Non configured sensors in DMS
http://intranet.nos-tcn.noaa.gov/wiki/index.php/ROS	ROS Steps and SOPs

2. Coordination Guidance for the Installation, Maintenance, and Removal of Water Level Stations

2.1. PORTS[®]

Installation, maintenance, and removal of stations for PORTS[®] shall be coordinated between Darren Wright, the IDIQ Task Managers, and FOD. Contractors or local user groups maintain nearly all PORTS[®] projects; FOD shall support these maintenance groups as necessary. PORTS[®] Met Only and Visibility station requirements are covered under each individual PORTS[®] operation and maintenance contract.

2.2. Hydrographic and Photogrammetric Surveys

Installation and removal of subordinate water level stations for NOAA in-house hydrographic and photogrammetric surveys shall be coordinated between the Products and Services Branch (PSB) Hydrographic Planning Team (HPT), Field Operations Division (FOD), and the Operations Branch (OB) of the Hydrographic Surveys Division of the NOS Office of Coast Survey, or the Remote Sensing Division (RSD) of the National Geodetic Survey (NGS), through Laura Rear McLaughlin, Mapping and Charting Program Manager. The DCP, sensor, and other equipment gauging activities shall also be coordinated between FOD and OB/RSD. The selection and installation of subordinate stations and sensors by FOD for these surveys shall be coordinated with OB/RSD and approved by Laura Rear McLaughlin, in concurrence with the ED and OD/PSB/HPT.

According to CO-OPS' policy, NOAA platforms, CO-OPS or CO-OPS' IDIQ contractors shall install the subordinate stations for NOAA in-house hydrographic or photogrammetric surveys. CO-OPS is responsible for maintaining control and subordinate stations for NOAA in-house hydrographic and photogrammetric surveys. Priority stations will be added to the Hydro Hot List. For NOAA contract hydrographic or photogrammetric surveys, the subordinate stations shall be installed by OCS contractors according to the OCS Hydrographic Surveys Specifications available on the OCS website at <http://nauticalcharts.noaa.gov/hsd/specs/specs.htm>. For NOAA contract photogrammetric surveys, the subordinate stations shall be installed by NGS contractors

according to the NGS Water Level Specifications and Deliverables for Shoreline Mapping Surveys:

http://tidesandcurrents.noaa.gov/publications/Water_Level_Station_Specifications_and_Deliverables_for_Shoreline_Mapping_Projects_Updated_May_2009.pdf.

Generally, the acoustic system shall be preferred for hydrographic or photogrammetric subordinate station installations. In cases where acoustic wells cannot be installed due to terrain, or in cold climates, installation of a portable digital bubbler system is authorized. For projects in the Great Lakes, the shaft angle encoder sensor shall be preferred.

The Commanding Officer of the survey ship or the Chief, Hydrographic Field Party, together with CO-OPS personnel, will be jointly responsible for monitoring the proper operation of these stations during the periods of survey operations. Problems shall be reported to FOD for corrective actions. Artara Johnson of ED is designated as the technical point of contact for NOAA in-house and contract hydrographic and photogrammetric survey projects, and may be contacted for daily activities related to hydro operations. Contact Carolyn Lindley of OD/HPT regarding hydro project planning activities.

2.3. NWLON Water Level Stations

Installation, maintenance, and removal of subordinate stations performed by CO-OPS personnel for future NWLON, PORTS[®], and COASTAL programs shall be coordinated among Kate Bosley (Operations Manager), Tom Landon, Darren Wright, Allison Allen, and the appropriate operational personnel in ED and FOD.

Reporting of NWLON performance metrics is coordinated in-house by Tom Landon, through the Deputy Director of CO-OPS. Data availability and number of annual inspections performed are reported monthly usually no later than the 10th of the month. These details must be reported well in advance of the preparation of monthly reports, and it is the responsibility of the AOB and POB field managers to ensure Tom has these statistics by the 5th of the month.

2.4. COASTAL Program

Installation, maintenance, and removal of stations performed by CO-OPS personnel for the COASTAL Program (including ecosystem restoration, climate, storm surge, and tsunami) shall be coordinated between Allison Allen and her project team, as well as any additional operational ED and FOD personnel, as appropriate.

2.5. Special Projects and Contract Projects

Installation, maintenance, and removal of NWLON stations and subordinate stations for special projects shall be coordinated among the Task and Project Manager, Program Managers, ED, and FOD, and shall follow the guidelines and specifications provided in “Standing Project Instructions for the Coastal and Great Lakes Water Level Stations, Updated August 2011.

3. Work Plan and Reporting

To systematize operations and handle growth, CO-OPS uses an operating procedure called the Reliable Operating System (ROS). ROS has eight steps as follows:

- Step 1: Project Scoping and Approval
- Step 2: Requirements Analysis and Project Planning
- Step 3: System Design and Resource Allocation
- Step 4: Procurement, Assembly, and Testing
- Step 5: Installation and Operational Acceptance
- Step 6: Operation and Maintenance
- Step 7: Data Management and Product Delivery
- Step 8: Assessment

Each of the steps has identified necessary products such as Standard Operating Procedures (SOP), templates, checklists, guidelines, handbooks, etc., that are relevant to the tasks for that step. CO-OPS ROS coordinators are developing these tools. All of the activities conveyed by these Project Instructions must follow the ROS guidelines as they are developed. As these products are developed, they are made available on the CO-OPS wiki page. The products that are relevant for CO-OPS' contracts are made available on the CO-OPS web page at <http://tidesandcurrents.noaa.gov/pub.html>.

3.1. Schedule, Reports, and Training

FOD shall develop and maintain an annual operations plan based upon the monthly schedule of stations' maintenance, and the work to be accomplished as required in PART C, Section 2.0, making best use of available resources. Assigned team leaders and contract task managers shall continually update the CO-OPS field activities calendar on the CO-OPS Google Calendar web site.

Contractors shall coordinate their schedules through their task managers, who in turn will coordinate with FOD to enter the contractors' schedules on the field calendar.

An annual Tides Training Class shall be offered to the appropriate personnel of the NOAA hydrographic survey ships and hydrographic field parties. Two classes shall be scheduled – one each at Chesapeake and Seattle – for this training as per the NOS milestone. The training class shall cover all aspects of tide station installation, operation, and maintenance. In addition to HPT, ED/OD shall participate with FOD, as appropriate, in the annual OCS field procedures workshop held each winter to coordinate survey or training activities.

**PART B: STANDING PROJECT INSTRUCTIONS FOR THE COASTAL
AND GREAT LAKES WATER LEVEL STATIONS, UPDATED AUGUST
2011**

See:

[http://tidesandcurrents.noaa.gov/publications/Standing Project Instructions for Coastal and Great Lakes Water Level Stations Updated August 2011 Final.pdf](http://tidesandcurrents.noaa.gov/publications/Standing_Project_Instructions_for_Coastal_and_Great_Lakes_Water_Level_Stations_Updated_August_2011_Final.pdf)

PART C: SPECIFIC REQUIREMENTS

1. Station Operational Groups

All operational NWLON and subordinate stations are listed in the Excel file “2012 Station Operational Lists.xls”. The file contains three worksheets: 1) 2012 NWLON Station Project Support Status; 2) 2012 NWLON Great Lakes Station Project Support Status; and 3) 2012 Subordinate Station Project Support Status (all other non-NWLON). The Great Lakes stations are distinguished from the coastal stations since they support projects not common to the coastal stations. Stations supporting various programs and NOAA mission goals are indicated with an “X”. These three worksheets are provided as reference for the field parties.

1.1. CY 2012 Reduced Diving Requirements for FOD Maintained Stations

An effort is being made to reduce the diving requirements in CY 2012 for stations maintained by FOD based on individual station characteristics. Station specific diving frequency and last dive information have been provided by ED as noted for each station in Part C, Section 2.0. It is the responsibility of FOD to determine reduced diving requirements based on field experience, and the dive frequency information listed. These reduced diving requirements only apply to CY 2012; they are being considered in light of known funding limitations and not a permanent change in requirements.

1.2. PORTS[®] Support

Forty-four (44) stations on the NWLON list provide support for the PORTS[®] navigational operations. PORTS[®] stations having meteorological sensors only are denoted on the subordinate station list.

Also, in the Great Lakes, five master control stations and 18 stations supporting International treaties shall be considered highest priority for continuous data collection. These stations provide water level and flow data to support International Treaties, the International Joint Commission (IJC) and the International Boards supporting the IJC, the International Forecast, Lake Regulations and Modeling efforts by the Corps of Engineers and Environment Canada as well as monitoring the sharing of the water for power generation between the United States and Canada.

1.3. Hydrographic and Photogrammetric Survey Support

Control stations designated on both the NWLON and Subordinate lists shall provide support for hydrographic and photogrammetric survey operations. Survey dates, platforms, and the required subordinate stations, and any changes or additions to this list will be provided in the hydro and photo project status sheet file under a separate cover. The dates listed in the time frame are preliminary and might change, but dates are provided for preliminary planning of field trips, as appropriate. Some of the planned NOAA in-house hydrographic and photogrammetric subordinate station installations may be handled through the IDIQ task orders. For individual hydro/photo projects, the project instructions developed by OD/HPT provide information about the number and names of subordinate projects needed for each project.

1.4. Emergency Repairs and Operational Station Status

Emergency repairs to stations with sensor/system problems shall be addressed immediately; routine maintenance may follow at a later date. See the CORMS control panel for station sensor status, <https://corms.nos.noaa.gov/ccp/>.

1.5. Upgraded or Relocated Stations

1.5.1. Upgraded Stations

The following stations need facilities upgrades as described. See PART C, Section 2.0., for specific requirements at each site.

8741533	Pascagoula NOAA Lab, MS – station upgrade by DNR using EM funds
9410170	San Diego, CA – prepare for the upcoming relocation of the water level station sometime in the future

1.5.2. Upgraded Stations through the NOAA Office of Climate Observation (OCO)

The NOAA Climate Program Office (CPO), within NOAA’s Office of Climate Observation (OCO) generally provides funding to upgrade the redundant stations/DCPs and/or for upgrading the geodetic network. Funding shall also be used for O&M support and performance of GPS observations at all Pacific Island sites. See PART C, Section 2.0., for specific requirements for each site.

1.5.3. Hurricane Station Reconstruction/Relocations

The following three (3) stations are proposed relocations or were damaged by hurricanes, typhoons, and/or storm surge over the last several years and need infrastructure improvements. All three stations are listed here for documentation. See PART C, Section 2.0., for specific requirements for each site.

8635150	Colonial Beach, VA (to be replaced by a new installation at the Dahlgren Navy facility)
8729210	Panama City Beach, FL (to be rebuilt by FOD – pier reconstruction completed in 2009)
8771450	Galveston Pier 21, TX (to be upgraded by DNR using EM funding)

1.5.4. Stations Planned for Continuously Operating Reference Station (CORS) Installation

CO-OPS is partnering with NGS to install a CORS site at the NWLON stations listed below. These stations were selected jointly by NGS and CO-OPS as representatives of the longest data series on the east coast. NGS personnel are in the process of performing a reconnaissance of these stations to determine the feasibility of a CORS installation co-located with the NWLON station. The worksheet titled “FY 2012 NWLON Station Project Support Status” of the Excel file “2012 Station Operational Lists.xls” identifies co-located NWLON/CORS sites.

1619910	Sand Island, Midway Islands (funding provided by NOAA OCO)
1890000	Wake Island (funding provided by NOAA OCO)
8418150	Portland, ME

8670870 Fort Pulaski, GA
 8720218 Mayport (Bar Pilots Dock), FL
 9414290 San Francisco, CA (funding provided by NOAA OCO)
 9419750 Crescent City, CA (funding provided by NOAA OCO)
 9435380 South Beach, OR (funding provided by NOAA OCO)
 9453220 Yakutat, AK

1.6. Stations with Malfunctioning Primary or Backup Sensors

Stations with malfunctioning primary (A1) sensors or backup bubbler (B1) sensors, indicated on the CORMS control panel and the Backup Water Level Gain and Offset web page, need repair or replacement in a timely manner. Bear in mind that transmission failures will also cause station sensors to appear on these lists as failed. Failure status of a given station backup sensor may not necessarily indicate a failed sensor, but does indicate that the sensor cannot be used if needed to replace the primary sensor data for dissemination. Refer to the following link for the resources: <https://corms.nos.noaa.gov/ccp/>

1.7. Stations Supporting CO-OPS COASTAL Program Projects

The stations listed on the COASTAL Program web site will be supporting projects that are part of the COASTAL Program. Continuous data collection at these sites, both NWLON and subordinate, is critical to the success of the projects. See the following link for the list of stations: <http://tidesandcurrents.noaa.gov/coastal.shtml>

1.8. Stations Supporting NOAA Tsunami and Storm Surge Requirements

The 2012 Station Operational Lists contains the NWLON stations supporting the NOAA Tsunami Warning Network and Storm Surge Network. Data collection platforms at all NWLON stations in the Pacific Islands, Alaska, West coast, most of the East coast and Gulf coast have been upgraded and are designated as “Tsunami-Capable”, and these stations are considered to be part of the tsunami warning network. The web link to the Tsunami web page is: <http://tidesandcurrents.noaa.gov/tsunami/>

1.9. Reimbursable Projects for CY12

1.9.1. NWLON Supported Projects

The reimbursable projects in the following table are operating or will be operating in CY 2012 in support of reimbursable, partnership, and special projects. Specific station requirements are provided for these stations being maintained by CO-OPS.

Project Station		Task		Control Station
Number	Name	Partner	Number	Number and Name
8662245	Oyster Landing, SC	Baruch	N/A	8665530 Charleston, SC
9411406	Platform Harvest	NASA/JPL	BK6EJP	9410660 Los Angeles, CA
9414958	Bolinas Lagoon, CA	NGS	1BK6EBL	9415020 Point Reyes, CA
9415218	Mare Island, CA	OCS	Unfunded	9414290 San Francisco, CA

9761115	Barbuda	Antigua-Barbuda Meteorological Services	1BK6ECR	N/A
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1.9.2. Potential COASTAL Project in WA

The following stations are part of a COASTAL project currently under review between the CO-OPS and the Tulalip Tribe.

<u>Station Number</u>	<u>Name</u>	<u>Partner</u>	<u>Task Number</u>
9447773	Tulalip Bay, WA	Tulalip Tribe	N/A
944XXXX	Priest Point, WA	Tulalip Tribe	N/A
944XXXX	Tulalip Shores, WA	Tulalip Tribe	N/A
944XXXX	Tulare Beach, WA	Tulalip Tribe	N/A

1.9.3. USACE+USGS+NOAA COASTAL Project

The following stations provide support to the joint U.S. Army Corps of Engineers, U.S. Geological Survey, and NOAA COASTAL South Bay Salt Pond Restoration Project. Operation and Maintenance are the responsibility of the Corps of Engineers.

<u>Station Number</u>	<u>Name</u>	<u>Partner</u>	<u>Task Number</u>
9414575	Coyote Creek, CA	USACE	N/A
9414549	Upper Guadalupe Slough, CA	USACE	N/A
9414585	Upper Coyote Creek, CA	USACE	N/A
9414551	Gold Street Bridge, CA	USACE	N/A
9414509	Dumbarton Bridge, CA	USACE	N/A

1.9.4. USACE San Francisco District Projects

The following stations are U.S. Army Corps of Engineers San Francisco District Project stations. The Operation and Maintenance are the responsibility of the Corps of Engineers.

<u>Station Number</u>	<u>Name</u>	<u>Partner</u>	<u>Task Number</u>
9415236	Three Mile Slough, CA	USACE	N/A
941XXXX	Port of W Sacramento, CA	USACE	N/A
9415056	Point Pinole, CA	USACE	N/A
9414746	Oakland-Alameda Park St Bridge	USACE	N/A
9414764	Oakland Inner Harbor, CA	USACE	N/A
9418817	Samoa, CA	USACE	N/A
9418723	Fields Landing, CA	USACE	N/A
941XXXX	Pillar Point Harbor, CA	USACE	N/A
941XXXX	Noyo Harbor, CA	USACE	N/A

1.10. Global Sea Level Program

The NOS is responsible for maintenance at the following station:

<u>Station Number</u>	<u>Station Name</u>
2695540	ESSO Pier, Bermuda

The NOS is also responsible for technical support to other countries such as Argentina. This includes technical guidance as requested, procurement of equipment, and shipping. The logistics of such support will be coordinated between FOD and ED.

1.11. Station, Bench Mark, and Met Photographs

OET and the Met Team are attempting to complete the catalog of required photos of station components and bench marks for each active station. Since last year's project instructions, we are asking for photos demonstrating the specific views that are missing from this catalog. These files must be named in accordance with the format described in the Standing Project Instructions.

The photos requested in the following Station Specifics do not have to be taken this year if the field party chief can find photos recently taken showing the requested view. As long as the photo is properly named and the view represented in the photo is clear, OET will accept it. It would be advantageous to the field party if this is done prior to visiting the station in case the photos do not meet the criteria and a new photo has to be taken during the site visit.

1.12. Other Technical Support

FOD shall provide technical support to various groups outside NOS as part of agreements, grants, or developing new programs. For several years, FOD has provided technical support to both the Florida Department of Environmental Protection (FDEP) and the Texas Coastal Ocean Observation Network (TCOON). Technical support shall also be provided to the Great Lakes Observing System (GLOS) as required, and perhaps other developing Regional Associations.

The Puerto Rican water level observation network managed by the Puerto Rico Seismic Network (PRSN) received technology transfer support and installed six water level stations at Mayaguez, Penuelas (Guayanilla), Yabucoa, Fajardo, Arecibo, and Vieques Island (Isabel Segunda) during 2007. Allison Allen, CO-OPS Program Manager, will prepare a Memorandum of Agreement between CO-OPS and PRSN, and a project plan for FY12. Allison Allen shall co-ordinate CO-OPS support for this project with CO-OPS resource managers. There is no funding identified for this effort.

2. Individual Station Requirements

The following individual station requirements, in addition to the required maintenance listed in the Standing Project Instructions (PART B), are based on the information obtained from review of field, data processing, and datum records. FOD and contractors are responsible for reviewing the NGWLMS status reports, e-mails, and CORMS morning reports for a station to determine recent station problems as part of the staging process for the annual inspection. Additional requirements or changes will be addressed in an amendment to Project Instructions. L-numbers for digital leveling are for calendar year 2011. NGS Permanent ID (PID) for the primary bench mark and station GPS mark, where available, are identified below in parenthesis for each station.

Station specific requirements grouped by Regions and Task Numbers as follows:

- | | | |
|-------|-------------------------------|---|
| 2.1. | FOD/AOB | East Coast Stations |
| 2.2. | FOD/AOB | Bermuda and the Caribbean Islands Stations |
| 2.3. | FOD/AOB | Gulf Coast Stations |
| 2.4. | Air-Sea Systems - Task 11-08 | Barbuda |
| 2.5. | Air-Sea Systems - Task 09-03 | Florida through Louisiana Stations |
| 2.6. | Air-Sea Systems - Task XXVIII | Lower Mississippi River PORTS [®] |
| 2.7. | Air-Sea Systems - Task 11-03 | Mobile Bay Storm Surge |
| 2.8. | Air-Sea Systems - Task 11-05 | Mobile PORTS [®] |
| 2.9. | Woods Hole Group - Task 11-07 | NY/NJ PORTS [®] |
| 2.10. | Woods Hole Group - Task 08-03 | Delaware River and Bay PORTS [®] |
| 2.11. | Woods Hole Group - Task 08-02 | Lake Charles PORTS [®] |
| 2.12. | Texas A&M DNR - Task XXIV | Gulfport and Pascagoula PORTS [®] |
| 2.13. | Texas A&M DNR - Task 09-02 | Houston/Galveston PORTS [®] |
| 2.14. | Texas A&M DNR - Task 10-04 | Texas Stations |
| 2.15. | FOD/AOB | Great Lakes Stations |
| 2.16. | FOD/POB | Hawaii, Pacific Islands, West Coast, and 16 Alaska Stations |
| 2.17. | JOA – Task 09-04 | Ten Alaska Stations |

Individual Station Headers

The individual stations have header information that identifies the station, its location, and critical information required for performing Annual Maintenance. The Station ID, Station Name, L-number, and leveling Part # are included in the first line. The second line identifies the Primary Bench mark (PBM) and the PBM elevation above Station Datum (SD). PBM above SD is necessary for properly abstracting the levels performed at the station. The GPS Bench Mark is identified and the value for Mean Sea Level (MSL) above SD is provided on the third line. MSL above SD is critical for calculating the barometer coefficient. GPS observation frequency and date of last GPS session are noted on line four. This information is essential for determining the necessity of performing GPS this year. For example, if the GPS frequency is every 5 years, and the last GPS session was in 2007, a session is required this year. This procedure is the same for the fifth and final line that conveys the dive inspection frequency and the date of the last dive. GPS and diving requirements **ARE NOT** identified in the individual requirements below the header.

2.1. FOD/AOB - East Coast Stations

2.1.1. FOD/AOB – Maine Stations

8410140 Eastport, ME

PBM: 841 0140 TIDAL 3 (PD0006)

GPS Bench Mark: EASTPORT 1989 (PID1179)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27851

Part 1

PBM above SD: 15.685 m

MSL above SD: 4.420 m

Last GPS Observation Performed: 10/09

Last Dive: 08/11

1. No additional requirements.

8411060 Cutler Farris Wharf, ME

PBM: L68 (AJ2727)

GPS Bench Mark: 841 1060 A (AJ2727)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27851

Part 6

PBM above SD: 10.005 m

MSL above SD: 3.796 m

Last GPS Observation Performed: 08/11

Last Dive: 08/11

1. Perform reconnaissance to move the Aquatrak Protective Well. This sensor is not measuring low water levels. Consider replacing the acoustic sensor with a pressure sensor if relocating the well is not possible.
2. Re-measure the elevations of the wind and air temperature sensors above the Met SRM.
3. Provide a description and photo of the Met SRM (the Met Team suggests using a bolt at base of the met tower).
4. Measure the elevation of the barometer above station datum.

8413320 Bar Harbor, ME

PBM: 841 3320 TIDAL 13

GPS Bench Mark: 841 3320 TIDAL 1 (AI8315)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27851

Part 3

PBM above SD: 7.544 m

MSL above SD: 2.786 m

Last GPS Observation Performed: 09/09

Last Dive: 08/11

1. If funding is available, install a new fiberglass tide house.

8418150 Portland, ME

PBM: TIDAL 31 STA 84 (OC0005)

GPS Bench Mark: 841 8150 TIDAL 3

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27851

Part 4

PBM above SD: 8.406 m

MSL above SD: 4.113 m

Last GPS Observation Performed: 09/10

Last Dive: 08/08

1. Take a location photo of the air temperature sensor.
2. Provide a description and photo of the Met SRM (the Met Team suggests a location on the concrete surface).

8419317 Wells, ME (COASTAL)

PBM: 841 9317 PUMP

GPS Bench Mark: 841 9317 A

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27851

Part 5

PBM above SD: 10.000 m

MSL above SD: 5.961 m

Last GPS Observation Performed: 09/10

Last Dive: 08/11

1. Coordinate the annual inspection with the COASTAL Program Manager, and the Wells Project Manager - Virginia Dentler.

2.1.2. FOD/AOB – New Hampshire Stations

8423898 Fort Point, NH

L27852

Part 1

PBM: 842 3898 TIDAL 2

PBM above SD: 7.510 m

GPS Bench Mark: CONSTITUTION 147 NO 1 1941 (OC0429)

MSL above SD: 2.265 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 10/09

Dive Inspection Frequency: Every year

Last Dive: 08/11

1. No additional requirements.

2.1.3. FOD/AOB – Massachusetts Stations

8443970 Boston, MA

PBM: K 12 (MY0555)

GPS Bench Mark: 844 3970 D TIDAL (AJ4030)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27853

Part 1

PBM above SD: 6.858 m

MSL above SD: 2.660 m

Last GPS Observation Performed: 07/10

Last Dive: 07/07

1. **Unresolved from 2011 Project Instructions:** Include Bench Marks 844 3970 C in the level run as it was not leveled to last year.
2. **Unresolved from 2011 Project Instructions:** Take face, setting, and location photos from two different cardinal directions of Bench Mark 844 3970 C.
3. Consider contracting out dive operation at this station. This station has operated for 4 years without a dive inspection.
4. Inspect the Tide Station shelter door. Replace one of the bottom interior screws as it is broken.
5. Update the bench mark sketch and leveling files to include the new stamping and designation of Bench Mark 844 3970 J12 RESET 2011.
6. Take a location photo of the air temperature sensor.

8447386 Fall River, MA (PORTS)

PBM: STATE (LW2264)

GPS Bench Mark: 844 7386 A

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27853

Part 2

PBM above SD: 10.000 m

MSL above SD: 7.028 m

Last GPS Observation Performed: 10/09

Last Dive: 09/10

1. Provide a description and photo of the Met SRM.

8447387 Borden Flats Light, MA (PORTS)

Met Only Station

1. Measure the elevation of the wind sensor above Met SRM.
2. Provide a description and photo of the Met SRM.
3. Measure the Met SRM height above water and document this elevation along with the date/time in the comments section of the site report.
4. Take station photos showing the met sensors.
5. Determine elevation of the barometer above the water level to obtain a height above MSL. Note elevation along with date/time in the comments section of the site report.

8447435 Chatham, MA**PBM:** 844 7435 B (AA7166)**GPS Bench Mark:** 844 7435 B TIDAL**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27853****Part 5****PBM above SD:** 5.861 m**MSL above SD:** 1.969 m**Last GPS Observation Performed:** 09/10**Last Dive:** 09/11

1. Coordinate the annual inspection with National Park Service staff.
2. Upgrade the DCP flash card with a 512 megabyte or larger to support two 250MB .log files. Upgrade the 15sec TSU.log file size to 250 MB. Ensure you have adapters for the cards in case the existing cards are one piece.

8447930 Woods Hole, MA**PBM:** 844 7930 TIDAL 11 (LW1571)**GPS Bench Mark:** 844 7930 B TIDAL (AJ4031)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27853****Part 3****PBM above SD:** 3.447 m**MSL above SD:** 1.096 m**Last GPS Observation Performed:** 06/09**Last Dive:** 09/11

1. Upgrade the DCP 2 flash card with a 512 megabyte or larger to support two 250MB .log files. Upgrade the 15sec TSU.log file size to 250 MB. Ensure you have adapters for the cards in case the existing cards are one piece.
2. Measure the elevation of the water temperature sensor and the barometer sensor above the appropriate datum as stated in Section 3.0 of the Guidelines for Meteorological Station Reconnaissance and Meteorological Sensor Height Measurements, Updated January 2011.
3. Re-measure the elevation of the air temperature sensor above the Met SRM. The Met Team suggests using Bench Mark 844 7930 A.

8448725 Menemsha Harbor, MA**PBM:** MEN 1**GPS Bench Mark:** MEN 4**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27853****Part 6****PBM above SD:** 10.000 m**MSL above SD:** 8.112 m**Last GPS Observation Performed:** 09/10**Last Dive:** 09/11

1. No additional requirements.

8449130 Nantucket, MA

PBM: 844 9130 TIDAL 25

GPS Bench Mark: 844 9130 K TIDAL (AJ4032)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27853

Part 4

PBM above SD: 3.147 m

MSL above SD: 1.454 m

Last GPS Observation Performed: 10/09

Last Dive: 09/11

1. Upgrade the DCP 2 flash card with a 512 megabyte or larger to support two 250MB .log files. Upgrade the 15sec TSU.log file size to 250 MB. Ensure you have adapters for the cards in case the existing cards are one piece.
2. Plan accordingly to repair the protective well. The well needs the entire parallel plate assembly repaired: the PVC flange, double cone, parallel plates, and stainless bolts.
3. Re-measure the elevations of wind and air temperature sensors above the Met SRM and enter these elevations into the site report.
4. Provide a description and photo of the Met SRM.

2.1.4. FOD/AOB – Rhode Island Stations

8452660 Newport, RI (PORTS) **L27854** **Part 1**
PBM: 845 2660 TIDAL 6 (LW0493) *PBM above SD:* 2.813 m
GPS Bench Mark: 844 9130 L *MSL above SD:* 1.106 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* 10/09
Dive Inspection Frequency: Every year *Last Dive:* 09/10

1. The "Alpine" Windbird requires special Teflon coated nose cone. Request the windbird nose cone from CIL before departing to the station.
2. Re-measure the elevation of the air temperature sensor above the Met SRM.

8452944 Conimicut Light, RI (PORTS) **L27854** **Part 2**
PBM: 845 2944 BOLT *PBM above SD:* 10.532 m
GPS Bench Mark: N/A *MSL above SD:* 6.291 m
GPS Observation Frequency: (Waived – not feasible)
Dive Inspection Frequency: Every year *Last Dive:* 09/10

1. Verify the presence of the parallel plates on the protective well.

8452951 Potter Cove, RI (PORTS) **Met Only Station**

1. Measure the elevations of the wind sensor above the Met SRM.
2. Provide a description and photo of the Met SRM.
3. Measure the Met SRM height above water and document this elevation along with the date/time in the comments section of the site report.
4. Take station photos showing the met sensors.
5. Determine the elevation of the barometer above the water level to obtain a height above MSL. Note elevation in the comments section.

8454000 Providence, RI (PORTS) **L27854** **Part 3**
PBM: 845 4000 TIDAL 6 RESET (LW0150) *PBM above SD:* 4.493 m
GPS Bench Mark: 845 4000 L TIDAL (AJ4033) *MSL above SD:* 1.749 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* 10/09
Dive Inspection Frequency: Every year *Last Dive:* 09/10

1. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8454049 Quonset Point, RI (PORTS)

PBM: 845 4049 D

GPS Bench Mark: 845 4049 D

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27854

Part 4

PBM above SD: 10.000 m

MSL above SD: 7.588 m

Last GPS Observation Performed: 10/09

Last Dive: 09/10

1. Verify installation of parallel plates.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

2.1.5. FOD/AOB – Connecticut Stations

8461490 New London, CT (PORTS)

PBM: 846 1490 B

GPS Bench Mark: 846 1490 K TIDAL (LX3418)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27855

Part 1

PBM above SD: 5.032 m

MSL above SD: 1.542 m

Last GPS Observation Performed: 11/09

Last Dive: 09/10

1. Re-measure the elevation of the barometer above station datum (should be ~5 m, but is currently documented as 0.5 m).
2. Verify the Met SRM location (the Met Team suggests 846 1490 N TIDAL) in the comments section of the site report.

8465705 New Haven, CT (PORTS)

PBM: 846 5705 D

GPS Bench Mark: 846 5705 C

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27855

Part 2

PBM above SD: 10.000 m

MSL above SD: 6.630 m

Last GPS Observation Performed: 11/09

Last Dive: 09/10

1. **Unresolved from 2011 Project Instructions:** Repair and/or install parallel plates on the primary water level sensor. Previous site visits indicate that the parallel plates are missing.
2. Re-measure the elevations of the wind sensors above the Met SRM.
3. Re-measure the elevation of the barometer above station datum (should be around 11 m, but is currently documented as 1 m).

8467150 Bridgeport, CT

PBM: 846 7150 A (AI1725)

GPS Bench Mark: 846 7150 D TIDAL (AJ4034)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27855

Part 3

PBM above SD: 3.544 m

MSL above SD: 1.708 m

Last GPS Observation Performed: 11/09

Last Dive: 07/08

1. **Unresolved from 2011 Project Instructions:** Take face, setting, and location photos from two different cardinal directions of Bench Mark 846 7150 B 1990. Make sure to retrieve the bench mark description for this mark from OET prior to visiting the station.
2. Upgrade the DCP 2 flash card with a 512 megabyte or larger to support two 250MB .log files. Upgrade the 15sec TSU.log file size to 250 MB. Ensure you have adapters for the cards in case the existing cards are one piece.
3. Take close up photo of the wind sensors while mounted on the Met tower. Previous photos of the wind sensors were taken while the Met tower was lowered for maintenance.
4. Re-measure the elevation of the barometer above station datum (should be ~5 m, but is currently documented as 2 m).

2.1.6. FOD/AOB – New York Stations

8510560 Montauk, NY

PBM: 851 0560 J (AH6725)

GPS Bench Mark: TIDAL 9 STA 2 50 (LW0831)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27856

Part 1

PBM above SD: 3.618 m

MSL above SD: 1.554 m

Last GPS Observation Performed: 09/10

Last Dive: 09/10

1. Re-measure the elevation of the barometer above station datum (should be ~3 m, but is currently documented as 0.9 m).

8516945 Kings Point, NY (PORTS)

PBM: 851 6945 A

GPS Bench Mark: 851 6945 TIDAL 5

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27856

Part 2

PBM above SD: 9.662 m

MSL above SD: 5.114 m

Last GPS Observation Performed: 09/09

Last Dive: 08/10

1. Measure the elevations of the wind and air temperature sensors above the Met SRM (the Met Team suggests a bolt at the base of the met tower).
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8530973 Robbins Reef, NY (PORTS)

Met Only Station

1. Measure the elevation of the wind sensor above the Met SRM.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
3. Take station photos showing the met sensors.
4. Determine the elevation of the barometer above the water level to obtain a height above MSL. Note elevation along with the date/time in the comments section of the site report.

2.1.7. FOD/AOB – New Jersey Stations

8531680 Sandy Hook, NJ (PORTS)	L27857	Part 1
<i>PBM:</i> 853 1680 D TIDAL (AB6711)		<i>PBM above SD:</i> 3.683 m
<i>GPS Bench Mark:</i> SIMPSON 2 RM 3 (KV0707)		<i>MSL above SD:</i> 1.551 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 09/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 08/10

1. **Unresolved from 2009 Project Instructions:** Pursue AC power supply and phone line installations through USCG.

8534720 Atlantic City, NJ	L27857	Part 2
<i>PBM:</i> 853 4720 F		<i>PBM above SD:</i> 10.554 m
<i>GPS Bench Mark:</i> 853 4720 F		<i>MSL above SD:</i> 2.186 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 08/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 08/09

1. Re-measure the elevation of the barometer above station datum (should be ~ 10 m, but is currently documented as 1.4 m).
2. Measure the elevation of the water temp elevation above station datum.
3. Provide a description and photo of the Met SRM.

8536110 Cape May, NJ (PORTS)	L27857	Part 3
<i>PBM:</i> 853 6110 TIDAL 1 (HU1194)		<i>PBM above SD:</i> 4.892 m
<i>GPS Bench Mark:</i> 853 6110 D		<i>MSL above SD:</i> 1.521 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 09/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 08/10

1. Provide a description and photo of the Met SRM.

2.1.8 FOD/AOB – Pennsylvania Stations

8545240 Philadelphia, PA (PORTS)

PBM: 854 5240 A

GPS Bench Mark: 854 5240 C

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27858

Part 2

PBM above SD: 4.688 m

MSL above SD: 2.224 m

Last GPS Observation Performed: 09/09

Last Dive: 08/10

1. Perform maintenance to the BWL pipe. Previous site reports indicate the bell housing and threaded portion of the BWL pipe are missing.
2. Recon made to harden station. Harden station will be designed by ED/AOB.

2.1.9. FOD/AOB – Delaware Stations

8551910 Reedy Point, DE (PORTS)

PBM: R 41 (JU2187)

GPS Bench Mark: 855 1910 G (AJ6314)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27859

Part 2

PBM above SD: 2.031 m

MSL above SD: 1.301 m

Last GPS Observation Performed: 09/09

Last Dive: 08/10

1. No additional requirements.

8551911 Reedy Point Air Gap, DE (PORTS)

Air Gap Station

1. No additional requirements.

8557380 Lewes, DE (PORTS)

PBM: 855 7380 TIDAL 20 (AJ8038)

GPS Bench Mark: 855 7380 TIDAL 20 (AJ8038)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every Year

L27859

Part 4

PBM above SD: 3.990 m

MSL above SD: 1.528 m

Last GPS Observation Performed: 9/20/09

Last Dive: 08/10

1. Obtain a new orifice pipe from CIL and replace the orifice pipe at the station.
2. Re-measure wind and air temperature sensor elevations above Met SRM. Indicate these elevations in the eSite report.
3. Identify Met SRM and include in leveling run. The Met Team recommends using a bolt at the base of the tower as Met SRM.

2.1.10. FOD/AOB – Maryland and DC Stations

8570283 Ocean City Inlet, MD <i>PBM:</i> 857 0283 J TIDAL <i>GPS Bench Mark:</i> 857 0283 J TIDAL <i>GPS Observation Frequency:</i> Every 5 years <i>Dive Inspection Frequency:</i> Every year	L27860	Part 1 <i>PBM above SD:</i> 4.979 m <i>MSL above SD:</i> 2.839 m <i>Last GPS Observation Performed:</i> 05/09 <i>Last Dive:</i> 06/07
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1. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8571421 Bishops Head, MD (COASTAL) <i>PBM:</i> 857 1421 A <i>GPS Bench Mark:</i> 857 1421 GRANGER <i>GPS Observation Frequency:</i> Every 5 years <i>Dive Inspection Frequency:</i> Every year	L27860	Part 11 <i>PBM above SD:</i> 10.000 m <i>MSL above SD:</i> 9.114 m <i>Last GPS Observation Performed:</i> 05/09 <i>Last Dive:</i> 07/08
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1. Coordinate with the COASTAL Program Manager to ensure that educational material is provided to the Karen Noonan Center. This was a condition of our agreement to establish the station. This is **MANDATORY** for 2012.

8571892 Cambridge, MD <i>PBM:</i> 857 1892 D TIDAL (AC6854) <i>GPS Bench Mark:</i> 857 1892 D TIDAL (AC68540) <i>GPS Observation Frequency:</i> Every 5 years <i>Dive Inspection Frequency:</i> Every year	L27860	Part 2 <i>PBM above SD:</i> 3.344 m <i>MSL above SD:</i> 1.060 m <i>Last GPS Observation Performed:</i> 05/09 <i>Last Dive:</i> 01/08
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1. **Unresolved from 2010 Project Instructions:** Careful consideration should be given to relocating the Tide Station as the pilings are deteriorated and some of the cross members are missing. Consider possible relocation to the city park on the other side of the channel pending contact and approval from city manager.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8573364 Tolchester Beach, MD (PORTS) <i>PBM:</i> 857 3364 A <i>GPS Bench Mark:</i> 857 3364 B TIDAL (AJ8034) <i>GPS Observation Frequency:</i> Every 5 years <i>Dive Inspection Frequency:</i> Every year	L27860	Part 3 <i>PBM above SD:</i> 2.963 m <i>MSL above SD:</i> 1.294 m <i>Last GPS Observation Performed:</i> 08/09 <i>Last Dive:</i> Unknown
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1. A solar panel is missing from eSite. Locate the serial number and add it in the eSite report.

8573927 Chesapeake City, MD (PORTS)
PBM: U 2 (JU1833)
GPS Bench Mark: 857 3927 D (PID)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27860

Part 4

PBM above SD: 3.158 m
MSL above SD: 1.426 m

Last GPS Observation Performed: 08/08
Last Dive: 07/11

1. No additional requirements.

8573928 Chesapeake City Air Gap, MD (PORTS)

Air Gap Station

AN ANNUAL INSPECTION WAS NOT PERFORMED DURING CY2011

1. No additional requirements.

8574680 Baltimore, MD (PORTS)

L27860

Part 5

PBM: 857 4680 TIDAL 32 (JV0586)

PBM above SD: 3.158 m

GPS Bench Mark: 857 4680 TIDAL BASIC (JV0578)

MSL above SD: 1.495 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 08/09

Dive Inspection Frequency: Every year

Last Dive: 07/11

1. Take digital photos of the face and setting (waist or chest high view) for Bench Mark TIDAL 1=SEAWALL. Circle all drill holes with yellow crayon and include in setting photo to show the mark in relation to reference marks.

8574728 Francis Scott Key Bridge, MD (PORTS)

Met Only Station

1. **Unresolved from 2011 Project Instructions:** Relocate the met sensor tower to resolve the obstruction of winds at the present site.

8574729 Francis Scott Key Bridge NE Tower, MD (PORTS)

Met Only Station

1. **Unresolved from 2011 Project Instructions:** Relocate the met sensor tower to resolve the obstruction of winds at the present site.

8575432 Bay Bridge Air Gap, MD (PORTS)

Air Gap Station

1. No additional requirements.

8575512 Annapolis, MD (PORTS)
PBM: 857 5512 TIDAL 7 (HV0207)
GPS Bench Mark: 857 5512 D TIDAL (AJ8035)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27860

Part 6

PBM above SD: 2.877 m
MSL above SD: 1.596 m

Last GPS Observation Performed: 08/09
Last Dive: 07/11

1. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8577330 Solomons Island, MD (PORTS)
PBM: 857 7330 E TIDAL (AJ8036)
GPS Bench Mark: 857 7330 J
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27860

Part 7

PBM above SD: 4.456 m
MSL above SD: 1.366 m

Last GPS Observation Performed: 07/09
Last Dive: 07/11

1. No additional requirements.

8577018 Cove Point, MD (PORTS)

Met Only Station

1. Take a photo of the met tower/suite to include the top of the structure and the ground with all mounted sensors clearly visible.
2. Measure the elevation of the wind sensor above Met SRM.
3. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level). Note elevation in comments section.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8578240 Piney Point, MD (PORTS)

Met Only Station

1. **Unresolved from 2011 Project Instructions:** Take a photo of the met tower/suite to include the top of the structure and the ground with all mounted sensors clearly visible.
2. Measure the elevation of the wind sensor above Met SRM.
3. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
4. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level). Note elevation in comments section.

8594900 Washington, DC (PORTS)
PBM: 859 4900 TIDAL 1 (HV1980)
GPS Bench Mark: 859 4900 K
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27861

Part 1

PBM above SD: 4.115 m

MSL above SD: 1.859 m

Last GPS Observation Performed: 06/10

Last Dive: 07/11

1. Bench Marks 859 4900 A and 859 4900 B have been destroyed. There are plans to raise the sea wall a few feet over the next couple of years, with the potential destruction of more bench marks from the network. Perform reconnaissance and identify areas to install several bench marks outside the construction zone.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

2.1.11. FOD/AOB – Virginia Stations

8631044 Wachapreague, VA

PBM: 863 1044 B

GPS Bench Mark: 863 1044 K TIDAL (AJ4587)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27862

Part 1

PBM above SD: 4.130 m

MSL above SD: 1.401 m

Last GPS Observation Performed: 07/09

Last Dive: Unknown

1. A new lab is being built for VIMS, which will include space for CO-OPS station instrumentation. The present hydro style installation (no backup sensor or DCP) will be upgraded to full NWLON status once we move into the lab sometime in 2011.
2. Measure the barometer height above station datum. Include this information in the barometer section of the eSite report.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8632200 Kiptopeke, VA (PORTS)

PBM: L 418 (FW0303)

GPS Bench Mark: 863 2200 B TIDAL (AJ4588)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27862

Part 2

PBM above SD: 4.093 m

MSL above SD: 1.539 m

Last GPS Observation Performed: 03/09

Last Dive: 08/11

1. Replace GOES antenna bracket with a standard aluminum GOES bracket and re-mount to Shakespeare pole.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8632837 Rappahannock Light, VA (PORTS)

Met Only Station

1. Take a photo of met tower/suite to include the top of the structure and the ground with all mounted sensors clearly visible.
2. Measure the elevation of the wind sensor above Met SRM.
3. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
4. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level). Note elevation in comments section.

8637611 York River East Rear Range Light, VA (PORTS)**Met Only Station**

1. **Unresolved from 2011 Project Instructions:** Take a photo of the met tower/sensor suite to include the top of the structure and the ground with all mounted sensors clearly visible.
2. Measure the elevation of the wind sensor above Met SRM.
3. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.

8637689 Yorktown, VA (PORTS)**L27862****Part 6*****PBM:*** 863 7689 B***PBM above SD:*** 5.070 m***GPS Bench Mark:*** 863 7689 C***MSL above SD:*** 1.964 m***GPS Observation Frequency:*** Every 5 years***Last GPS Observation Performed:*** 08/10***Dive Inspection Frequency:*** Every year***Last Dive:*** 07/11

1. Re-describe Bench Mark 7689 C 2008 and include the distance between the datum point and ground level.
2. Provide a description and photo of the Met SRM.

8638511 Dominion Terminal, VA (PORTS)**Met Only Station**

1. **Unresolved from 2011 Project Instructions:** Take a photo of the met tower/suite to include the top of the structure and the ground with all mounted sensors clearly visible.
2. Measure the elevation of the wind sensor above Met SRM.
3. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
4. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level). Note elevation in comments section.

8638595 South Craney Island, VA (PORTS)**Met Only Station**

1. **Unresolved from 2011 Project Instructions:** Take a photo of the met tower/sensor suite to include the top of the structure and the ground with all mounted sensors clearly visible.
2. Measure the elevation of the wind sensor above Met SRM.
3. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
4. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level). Note elevation in comments section.

8638614 Willoughby Degaussing Station, VA (PORTS)**Met Only Station**

1. **Unresolved from 2011 Project Instructions:** Take a photo of the met tower/sensor suite to include the top of the structure and the ground with all mounted sensors clearly visible.
2. Measure the elevation of the wind sensor above Met SRM.
3. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
4. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level). Note elevation in comments section.

8638610 Sewells Point, VA (PORTS)**L27862****Part 7****PBM:** 863 8610 G TIDAL**PBM above SD:** 4.314 m**GPS Bench Mark:** 863 8610 F**MSL above SD:** 1.748 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 05/10**Dive Inspection Frequency:** Every year**Last Dive:** 08/10

1. Verify the total length of the conductivity sensor well.

8638863 Chesapeake Bay Bridge Tunnel, VA (PORTS)**L27862****Part 8****PBM:** 863 8863 NO 2 TIDAL (AJ4591)**PBM above SD:** 15.914 m**GPS Bench Mark:** 863 8863 NO 2 TIDAL (AJ4591)**MSL above SD:** 8.135 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/09**Dive Inspection Frequency:** Every year**Last Dive:** 07/11

1. **Unresolved from 2011 Project Instructions:** The station interior needs to be refurbished, in accordance with a plan originally developed by Mark Bushnell, if funding becomes available. The top cap needs to be removed and new additional aluminum wells need to be jacked into ocean bottom and secured to building floor with additional access holes.
2. The current position of the air temperature sensor under the pier does not follow Met siting guidelines. Relocate the sensor, preferably to the wind sensor tower.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8638999 Cape Henry, VA (PORTS)

Met Only Station

1. **Unresolved from 2011 Project Instructions:** Take a photo of the met tower/suite to include the top of the structure and the ground with all mounted sensors clearly visible.
2. Measure the elevation of the wind sensor above Met SRM.
3. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
4. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level). Note elevation in comments section.

8639348 Money Point, VA (PORTS)

L27862

Part 9

PBM: 863 9348 E

PBM above SD: 10.000 m

GPS Bench Mark: Undetermined

MSL above SD: 7.064 m

GPS Observation Frequency: Every 5 years **Last GPS Observation Performed:** Undetermined

Dive Inspection Frequency: Every year

Last Dive: 08/11

1. **Unresolved from 2010 Project Instructions:** Take photos of the DCPs; the Primary Sensor; and a close up photo of the wind sensors.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

2.1.12. FOD/AOB – North Carolina Stations

8651370 Duck, NC <i>PBM:</i> 865 1370 B TIDAL, (FW0688) <i>GPS Bench Mark:</i> 865 1370 C (FW0686) <i>GPS Observation Frequency:</i> Every 5 years <i>Dive Inspection Frequency:</i> Every year	L27863	Part 1 <i>PBM above SD:</i> 10.061 m <i>MSL above SD:</i> 6.202 m <i>Last GPS Observation Performed:</i> 07/08 <i>Last Dive:</i> 06/09
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1. **Unresolved from 2011 Project Instructions:** Recover Bench Mark B 255 1981 and include in the level run as this mark was not leveled last year.

8652587 Oregon Inlet Marina, NC <i>PBM:</i> 865 2587 NO 3 TIDAL (EX0150) <i>GPS Bench Mark:</i> 865 2587 TIDAL A <i>GPS Observation Frequency:</i> Every 5 years <i>Dive Inspection Frequency:</i> Every year	L27863	Part 5 <i>PBM above SD:</i> 5.214 m <i>MSL above SD:</i> 0.986 m <i>Last GPS Observation Performed:</i> 08/08 <i>Last Dive:</i> 05/07
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1. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8654467 USCG Station Hatteras, NC <i>PBM:</i> 865 4467 C <i>GPS Bench Mark:</i> H 1 NC 79 <i>GPS Observation Frequency:</i> Every 5 years <i>Dive Inspection Frequency:</i> Every year	L27863	Part 6 <i>PBM above SD:</i> 10.000 <i>MSL above SD:</i> 8.482 <i>Last GPS Observation Frequency:</i> 04/10 <i>Last Dive:</i>
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1. No additional requirements.

8656483 Duke Marine Lab, NC (COASTAL) <i>PBM:</i> 865 6483 NO 11 (AI9505) <i>GPS Bench Mark:</i> 865 6483 E TIDAL (DE7961) <i>GPS Observation Frequency:</i> Every 5 years <i>Dive Inspection Frequency:</i> Every year	L27863	Part 3 <i>PBM above SD:</i> 3.097 m <i>MSL above SD:</i> 1.083 m <i>Last GPS Observation Performed:</i> 08/08 <i>Last Dive:</i> 01/11
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1. Please coordinate the annual inspection with the COASTAL Program Manager.
2. Re-measure wind and air temperature sensor elevations above Met SRM. Indicate these elevations in the eSite report.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met Team recommends using a bolt at the base of the tower as Met SRM.

8658120 Wilmington, NC

L27863

Part 4

PBM: 865 8120 D

PBM above SD: 2.454 m

GPS Bench Mark: 865 8120 C TIDAL RM 1 (EA3063)

MSL above SD: 1.490 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 10/09

Dive Inspection Frequency: Every year

Last Dive: 10/06

1. **Unresolved from 2011 Project Instructions:** Take face, setting, and location photos from two different cardinal directions of Bench Mark 865 8120 TIDAL 5 USE.

8658163 Wrightsville Beach, NC

L27863

Part 11

PBM: 865 8163 A

PBM above SD: 10.000 m

GPS Bench Mark: C 163 (EA0631)

MSL above SD: 6.415 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 10/09

Dive Inspection Frequency: Every year

Last Dive: 10/09

1. **Unresolved from 2011 Project Instructions:** Take setting photos of Bench Marks 865 8163 A and 865 8163 B.
2. Measure the elevation of the wind and air temperature sensors above the Met SRM.
3. Measure the elevation of the barometer above station datum, not the primary bench mark.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met Team suggests using Bench Mark 865 8163 B as Met SRM.

2.1.13. FOD/AOB – South Carolina Stations

8661070 Springmaid Pier, SC

L27864

Part 1

PBM: 866 1070 J TIDAL (DD1542)

PBM above SD: 11.948 m

GPS Bench Mark: K 137 (DD0853)

MSL above SD: 9.754 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 10/07

Dive Inspection Frequency: Every year

Last Dive: 12/10

1. Replace the parallel plates.
2. Measure the elevation of the wind and air temperature sensors above Met SRM.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met Team suggests using a bolt at the base of the met tower.

8662245 Oyster Landing, SC (COASTAL)

L27864

Part 8

PBM: 866 2245 A TIDAL (DD1345)

PBM above SD: 2.962 m

GPS Bench Mark: 866 2245 A TIDAL (DD1345)

MSL above SD: 2.031 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 11/07

Dive Inspection Frequency: Every year

Last Dive: 12/10

1. Please coordinate the annual inspection with the COASTAL Program Manager.
2. **Unresolved from 2011 Project Instructions:** Relocate the Protective Well.
3. **Unresolved from 2011 Project Instructions:** Take setting photos of Bench Marks 866 2245 A TIDAL and 866 2245 E TIDAL.
4. **Unresolved from 2011 Project Instructions:** Take photos of the, DCPs; the Primary Sensor; and the Protective Well.

8665530 Charleston, SC

L27864

Part 2

PBM: 866 5530 TIDAL 13 (CJ0085)

PBM above SD: 4.020 m

GPS Bench Mark: PORT 1962 (CJ0326)

MSL above SD: 1.733 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 11/07

Dive Inspection Frequency: Every year

Last Dive: 12/10

1. Take photos of the Primary Sensor and the Protective Well; and a close up photo of the wind sensors.

8667633 Clarendon Plantation, SC

L27864

Part 33

PBM: 866 7633 A (CK2205)

PBM above SD: 6.242 m

GPS Bench Mark: Undetermined

MSL above SD: 2.062 m

GPS Observation Frequency: Every 5 years ***Last GPS Observation Performed:*** Undetermined

Dive Inspection Frequency: Every year

Last Dive: 11/10

1. **Unresolved from 2011 Project Instructions:** Include in the level run Bench Marks 866 7633 TIDAL 3 and 866 7633 TIDAL 4 to verify substantial movement noted on previous level run.
2. **Unresolved from 2011 Project Instructions:** Include Bench Marks 866 7633 TIDAL 2 and 866 7633 TIDAL 5 in the level run as these marks were last leveled in 2008. The bench mark sketches are archived in the 2008 folder and can be found in the "prior field notes" folder, located in the "Levels" then "Crew" folders.
3. **Unresolved from 2011 Project Instructions:** Take face, setting, and location photos from two different cardinal directions of Bench Mark 866 7633 TIDAL 2.

2.1.14. FOD/AOB – Georgia Stations

8670870 Fort Pulaski, GA

PBM: 867 0870 TIDAL 5 (CK0697)

GPS Bench Mark: 867 0870 TIDAL 5 (CK0697)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27865

Part 1

PBM above SD: 4.877 m

MSL above SD: 2.230 m

Last GPS Observation Performed: 11/07

Last Dive: 11/10

1. No additional requirements.

2.1.15. FOD/AOB – Florida East Coast Stations

8720030 Fernandina Beach, FL **L27866** **Part 1**
PBM: 872 0030 TIDAL 34 (BC0166) **PBM above SD:** 4.770 m
GPS Bench Mark: CONTAINER (BC2488) **MSL above SD:** 1.522 m
GPS Observation Frequency: Every 5 years **Last GPS Observation Performed:** 01/09
Dive Inspection Frequency: Every year **Last Dive:** 01/10

1. **Unresolved from 2010 Project Instructions:** Take setting and general location photos of Bench Marks 872 0030 TIDAL 22, 872 0030 E 3, 872 0030 TIDAL 38, 872 0030 TIDAL 37 RESET, and 872 0030 TIDAL 36; and take face photos of the following Bench Marks 8720030 TIDAL 36, 8720030 TIDAL 38, and 8720030 TIDAL 22.
2. Recover or confirm destruction of Bench Marks 8720030 TIDAL 22 and update the bench mark sketch.
3. Provide handheld GPS positions in DDMSS.S format for Bench Marks 872 0030 TIDAL 36, and 8720030 TIDAL 22.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8720218 Mayport Bar Pilots Dock, FL **L27866** **Part 2**
PBM: 870 0218 A TIDAL (DI9221) **PBM above SD:** 5.000 m
GPS Bench Mark: 872 0220 A TIDAL (BC2486) **MSL above SD:** 3.516 m
GPS Observation Frequency: Every 5 years **Last GPS Observation Performed:** 01/08
Dive Inspection Frequency: Every year **Last Dive:** 03/11

1. Provide handheld GPS positions for J 234 Reset.
2. Remove Bench Mark 8720220 C TIDAL from the bench mark sketch, the mark was destroyed.
3. Measure the elevation of the wind and air temperature sensors above Met SRM.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met Team suggests using a bolt at the base of the met tower.

8721604 Trident Pier, FL **L27866** **Part 19**
PBM: 872 1604 A **PBM above SD:** 9.303 m
GPS Bench Mark: 872 1604 C TIDAL (AJ2449) **MSL above SD:** 6.053 m
GPS Observation Frequency: Every 5 years **Last GPS Observation Performed:** 06/09
Dive Inspection Frequency: Every year **Last Dive:** 03/11

1. Include Bench Mark 872 1604 D in level run.
2. Measure the elevation of the wind and air temperature sensors above Met SRM.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met Team suggests using a bolt at the base of the met tower.

8722670 Lake Worth Pier, FL**L27866****Part 6****PBM:** P 317 (AD2724)**PBM above SD:** 15.111m**GPS Bench Mark:** N 317 RESET**MSL above SD:** 9.602m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/10**Dive Inspection Frequency:** Every year**Last Dive:** 06/11

1. **Unresolved from 2010 Project Instructions:** Include Bench Marks 872 2670 H and 872 2670 J in the level run as these marks have not been leveled since 1991. These marks need to be searched for in the next visit.
2. Take face, setting, and general location photos of all existing bench marks.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8723214 Virginia Key, FL**L27866****Part 5****PBM:** 872 3214 B (AH5251)**PBM above SD:** 5.000 m**GPS Bench Mark:** 872 3214 E**MSL above SD:** 3.431 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 02/09**Dive Inspection Frequency:** Every year**Last Dive:** 02/11

1. **Unresolved from 2011 Project Instructions:** Provide handheld GPS positions in DDMSS.S format for Bench Mark 872 3214 MI 6 RESET.
2. Measure the elevation of the wind and air temperature sensors above Met SRM.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met Team suggests using a bolt at the base of the met tower.

8723970 Vaca Key, FL**L27866****Part 7****PBM:** 872 3970 M TIDAL (AA1706)**PBM above SD:** 2.073 m**GPS Bench Mark:** R 273 (AA0302)**MSL above SD:** 0.931 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/09**Dive Inspection Frequency:** Every year**Last Dive:** 04/11

1. **Unresolved from 2010 Project Instructions:** Take setting photos of Bench Marks 872 3970 A TIDAL, 872 3970 B TIDAL, and general location photos of 872 3970 M TIDAL.
2. Provide the handheld GPS position in DDMSS.S format for Bench Mark 872 3970 TIDAL 2.
3. If construction project on the east side of the Coast Guard Station affects Bench Marks 872 3970 TIDAL 1, 872 3470 A TIDAL, and 872 3970 TIDAL B then reestablish bench marks and contact OET.
4. Install some new bench marks (at least one 3D rod mark), including a candidate for a new PBM.
5. Measure the elevation of the wind and air temperature sensors above Met SRM.
6. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met Team suggests using a bolt at the base of the met tower.

8724580 Key West, FL

PBM: 872 4580 E TIDAL (AJ2450)

GPS Bench Mark: 872 4580 E TIDAL (AJ2450)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27866

Part 8

PBM above SD: 3.116 m

MSL above SD: 1.662 m

Last GPS Observation Performed: 06/09

Last Dive: 04/11

1. Field crew must contact Danny Franco, Maintenance Manager of the Truman Annex Master Property Owner's Association in order to survey across the property of Truman Annex. (305)296-0556, (305)923-3922, danny@tamboa.com.

2.2. FOD/AOB – Bermuda and the Caribbean Island Stations

2695540 Bermuda Esso Pier	L27876	Part 1
<i>PBM:</i> 269 5540 A		<i>PBM above SD:</i> 14.298 m
<i>GPS Bench Mark:</i> 269 5540 A		<i>MSL above SD:</i> 1.410 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 04/08	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 08/11

Note: maintenance costs for this station shall be charged to the Global Sea Level task number.

1. **Unresolved from 2011 Project Instructions:** Level to Bench Marks 269 5535 F and 269 5535 H.

9751364 Christiansted Harbor, St. Croix, VI	L27872	Part 3
<i>PBM:</i> 975 1364 A		<i>PBM above SD:</i> 10.000 m
<i>GPS Bench Mark:</i> 975 1364 A		<i>MSL above SD:</i> 8.367 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 02/08	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 02/11

1. A small U-bolt used for the bubbler orifice is missing and needs to be replaced with a S/S U-bolt; it is a 1" pipe.
2. Add 4 new bench marks, 2 of them deep rod marks, with designation/stamping 975 1364 H/1364 H 2012, 975 1364 J/1364 J 2012, 975 1364 K/1364 K 2012, 975 1364 M/1364 M 2012.
3. Update the bench mark sketch with the new bench marks.
4. Take close up, setting, and location photos of the new bench marks.
5. Provide a description and photo of the Met SRM. Rename SRM BOLT to MET SRM BOLT.

9751381 Lameshur Bay, St John, VI	L27872	Part 4
<i>PBM:</i> 975 1381 A		<i>PBM above SD:</i> 10.000 m
<i>GPS Bench Mark:</i> 975 1381 A		<i>MSL above SD:</i> 8.923 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 03/08	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 03/11

1. Replace parallel plates.
2. Re-measure the elevation of the barometer above station datum (should be ~11 - 12 m, but is currently documented as 1.4 m).

9751401 Lime Tree Bay, St. Croix, VI
PBM: 975 1401 M
GPS Bench Mark: 975 1401 M
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27872

Part 1

PBM above SD: 13.612 m
MSL above SD: 10.501 m

Last GPS Observation Performed: 02/08
Last Dive: 02/11

1. **Unresolved from 2011 Project Instructions:** Rebuild the gauge house and frame, if funding is available.
2. Re-measure the elevation of the barometer above station datum (should be ~15 m, but is currently documented as 1.5 m).
3. Rename SRM BOLT to MET SRM BOLT.

9751639 Charlotte Amalie, St. Thomas, VI
PBM: 975 1639 F
GPS Bench Mark: 975 1639 M (TV1548)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27872

Part 2

PBM above SD: 3.267 m
MSL above SD: 1.715 m

Last GPS Observation Performed: 02/07
Last Dive: 03/11

1. **Unresolved from 2011 Project Instructions:** Level Bench Mark 975 1639 J.
2. Rebuild gauge house with custom aluminum stand and aluminum box.
3. Rename SRM BOLT to MET SRM BOLT.

9752235 Culebra, PR (COASTAL)
PBM: 975 2235 A
GPS Bench Mark: 975 2235 A
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27871

Part 6

PBM above SD: 10.000 m
MSL above SD: 8.514 m

Last GPS Observation Performed: 03/08
Last Dive: 03/11

1. Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
2. Re-measure the elevations of the wind and air temperature sensors above the Met SRM
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
4. Measure the elevation of the barometer above station datum.

9752695 Vieques Island, PR (COASTAL)
PBM: 975 2695 A TIDAL
GPS Bench Mark: 975 2695 A TIDAL
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27871

Part 7

PBM above SD: 10.000 m
MSL above SD: 8.041 m
Last GPS Observation Performed: 03/08
Last Dive: 03/11

1. Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
2. Re-measure the elevations of the wind and air temperature sensors above the Met SRM (suggest using Bench Mark 975 2695 A as Met SRM) and document this in the comments section of the site report.

9755371 San Juan, PR (COASTAL)
PBM: 975 5371 A TIDAL (TV1513)
GPS Bench Mark: 975 5371 M
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27871

Part 3

PBM above SD: 2.600 m
MSL above SD: 1.266 m
Last GPS Observation Performed: 03/08
Last Dive: 03/11

1. Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.

9759110 Magueyes Island, PR (COASTAL)
PBM: 975 9110 BM 1
GPS Bench Mark: 975 9110 G
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27871

Part 4

PBM above SD: 4.755 m
MSL above SD: 1.191 m
Last GPS Observation Performed: 02/08
Last Dive: 02/11

1. Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
2. Re-measure the elevation of the barometer above station datum (should be ~ 6 - 7 m, but is currently documented as 1 m).
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
4. Replace solar panel and battery for the Waterlogger.

9759412 Aguadilla Pier, PR (COASTAL)

PBM: 975 9412 TIDAL 3 (DE5552)

GPS Bench Mark: 975 9412 E

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27871

Part 8

PBM above SD: 10.000 m

MSL above SD: 7.087 m

Last GPS Observation Performed: 02/08

Last Dive: 02/11

1. Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
2. Take a photo showing location of the air temperature sensor.
3. Install plastic male coupling to secure the GPS bracket.

9759938 Mona Island, PR (COASTAL)

PBM: 975 9938 A

GPS Bench Mark: 975 9938 F

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27871

Part 9

PBM above SD: 10.000 m

MSL above SD: 8.846 m

Last GPS Observation Performed: 02/08

Last Dive: 02/11

1. Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.

2.3. FOD/AOB – Florida Gulf Coast Stations

NOTE: All maintenance for Tampa Bay PORTS® stations shall be coordinated with Brad Wynn and Dr. Mark Luther, Chief Operating Officer of GTBMAC/PORTS® (727-553-1528).

8725110 Naples, FL	L27866	Part 9
<i>PBM:</i> 872 5110 TIDAL 7 (AD5731)		<i>PBM above SD:</i> 4.225 m
<i>GPS Bench Mark:</i> 872 5110 C TIDAL (AD6337)		<i>MSL above SD:</i> 1.155 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 05/09	
<i>Dive Inspection Frequency:</i> Every year		Last Dive: 04/11

1. No additional requirements

8725520 Fort Myers, FL	L27866	Part 10
<i>PBM:</i> 872 5520 A TIDAL (AD7888)		<i>PBM above SD:</i> 2.746 m
<i>GPS Bench Mark:</i> 872 5520 A TIDAL (AD7888)		<i>MSL above SD:</i> 1.522 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 04/09	
<i>Dive Inspection Frequency:</i> Every year		Last Dive: 06/11

1. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
2. Measure the elevation of the wind and air temperature sensors above Met SRM, not above station datum.

8726724 Clearwater Beach, FL	L27866	Part 12
<i>PBM:</i> LP 10 1 FLHD (AG7197)		<i>PBM above SD:</i> 2.234 m
<i>GPS Bench Mark:</i> 872 6724 R 44 (AG6373)		<i>MSL above SD:</i> 0.970 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 04/09	
<i>Dive Inspection Frequency:</i> Every year		Last Dive: 03/11

1. **Unresolved from 2010 Project Instructions:** Establish and level a 3D rod mark, designation/stamping 872 6724 M/6724 M 2012. Update the bench mark sketch and take digital photos of the setting, face, and general location.
2. Verify the primary DCP serial number.
3. Measure the elevation of the wind and air temperature sensors above Met SRM.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8726384 Port Manatee, FL (PORTS)
PBM: 872 6384 E (AG7341)
GPS Bench Mark: 872 6384 E
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27866

Part 20

PBM above SD: 2.6660 m
MSL above SD: 0.417 m

Last GPS Observation Performed: 04/09
Last Dive: 02/11

1. No additional requirements.

8726520 St. Petersburg, FL (PORTS)
PBM: 872 6520 D
GPS Bench Mark: 872 6520 A
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27866

Part 11

PBM above SD: 2.8504 m
MSL above SD: 1.394 m

Last GPS Observation Performed: 04/09
Last Dive: 03/11

4. Bench Mark 872 6520 ST PETE-1 location photo and Bench Mark 872 6520 ST PETE-2 is missing the face photo due to inability to get clear picture.
5. Measure the elevation of the wind and air temperature sensors above Met SRM, not above the primary bench mark. Measure the elevation of the water temperature sensor above station datum.
6. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met Team suggests using a bolt at the base of the met tower.

8726607 Old Port Tampa, FL (PORTS)
PBM: 872 6607 A
GPS Bench Mark: 872 6607 A
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Annually

L27866

Part 21

PBM above SD: 10.0000 m
MSL above SD: 9.012 m

Last GPS Observation Performed: 04/09
Last Dive: 02/11

1. Measure the elevation of the wind sensor above Met SRM.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
3. Include photos of the meteorological sensor suite with the station package.

8726667 CSX Rockport, McKay Bay Entrance, FL (PORTS)

L27866

Part 22

PBM: 872 6667 J
GPS Bench Mark: 872 6667 J
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

PBM above SD: 3.1200 m
MSL above SD: 0.521 m

Last GPS Observation Performed: 04/09
Last Dive: 3/11

1. No additional requirements.

2.4. Air-Sea Systems - Task 11-08: Barbuda

David Lane, Task Manager/Technical Representative (TR)

9761115 Barbuda (COASTAL)

PBM: 976 1115 A

GPS Bench Mark: None Specified

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

Part 1

PBM above SD: 10.000 m

MSL above SD: 8.655 m

Last GPS Observation Performed: None

Last Dive: None

1. Coordinate with the COASTAL Program Manager. Also coordinated with the Antigua and Barbuda Meteorological Services any time site visits are scheduled.
2. Perform GPS session.

2.5. Air-Sea Systems - Task 09-03: Florida through Louisiana Stations

Brad Wynn, Task Manager/Technical Representative (TR)

8727520 Cedar Key, FL

L27866

Part 13

PBM: TIDAL STATION 3-60 TIDAL 8 (AR1204)

PBM above SD: 2.347 m

GPS Bench Mark: 872 7520 L

MSL above SD: 1.171 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 11/10

Dive Inspection Frequency: Every year

Last Dive: 12/10

1. **Unresolved from 2011 Project Instructions:** Establish and level a 3D rod mark, designation/stamping: 872 7520 B/7520 B 2011. Update the bench mark sketch.
2. **Unresolved from 2011 Project Instructions:** Recover or confirm destruction of Bench Mark 872 7520 A TIDAL. Update the bench mark sketch.
3. **Unresolved from 2011 Project Instructions:** Provide the handheld GPS position in DDMSS.S format for Bench Mark 872 7520 B and recovered mark 872 7520 A TIDAL.
4. **Unresolved from 2011 Project Instructions:** Take setting photo of Bench Mark PARK.
5. **Unresolved from 2011 Project Instructions:** Take face, setting, and location photos of Bench Marks TIDAL STA 3-60 TIDAL 8, 872 7520 TIDAL 17, 872 7520 TIDAL 18, D 280, D 290, 872 7520 K TIDAL, FDNR 1, 872 7520 TIDAL 16 and 872 7520 TIDAL 25, 872 7520 A TIDAL and 872 7520 B.
6. Measure the elevation of the wind and air temperature sensors above Met SRM, not above station datum.
7. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8728690 Apalachicola, FL

L27866

Part 15

PBM: 872 8690 TIDAL 1 (AS0240)

PBM above SD: 5.669 m

GPS Bench Mark: APALACHICOLA (AS0244)

MSL above SD: 1.584 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 11/09

Dive Inspection Frequency: Every year

Last Dive: 12/10

1. **Unresolved from 2011 Project Instructions:** Recover Bench Mark STA 3-66 WEST POINT NO 2, this mark was reported as not recovered in the past. Update the bench mark sketch.
2. **Unresolved from 2011 Project Instructions:** Provide handheld GPS in DDMSS.S format for Bench Mark STA 3-66 WEST POINT NO 2.
3. **Unresolved from 2011 Project Instructions:** Include Bench Mark D 689, P 294, Q 294, and STA 3-66 West Point NO 2 in the level run as these marks have not been leveled since 1991.
4. **Unresolved from 2011 Project Instructions:** Take setting photos of Bench Marks Apalachicola, J 45, 872 8690 TIDAL 3, 872 8690 TIDAL 4, 872 8690 A TIDAL, 8728 690 B, 8728 690 D TIDAL, 872 8690 E TIDAL, 872 8690 F, and 872 8690 TIDAL 1.
5. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8729108 Panama City, FL **L27866** **Part 16**
PBM: 872 9108 L TIDAL (BE3028) *PBM above SD: 3.965 m*
GPS Bench Mark: 872 9108 L TIDAL (BE3028) *MSL above SD: 1.222 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 06/09*
Dive Inspection Frequency: Every year *Last Dive: 05/11*

1. Measure the elevation of the wind and air temperature sensors above Met SRM.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8729210 Panama City Beach, FL **L27866** **Part 17**
PBM: 872 9210 A (AJ6758) *PBM above SD: 13.725 m*
GPS Bench Mark: 872 9210 M *MSL above SD: 8.440 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 06/09*
Dive Inspection Frequency: Every year *Last Dive: 06/07*

1. Coordinate with the city on plans for a new station to be installed in 2012 by FOD.
2. Install the new NWLON station using dual Paros primary WL sensors with pressure backup WL sensor, and full met sensor suite.

8729840 Pensacola, FL **L27866** **Part 18**
PBM: 872 9840 M TIDAL (BG4867) *PBM above SD: 4.368 m*
GPS Bench Mark: 872 9840 M TIDAL (BG4867) *MSL above SD: 2.757 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 07/09*
Dive Inspection Frequency: Every year *Last Dive: 05/11*

1. **UNRESOLVED FROM 2010 and 2011 PROJECT INSTRUCTIONS:** Establish and level one new bench mark, designation/stamping: 872 9840 X/9840 X 2012. Update the bench mark sketch.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8732828 Weeks Bay, AL (NERRS) (COASTAL) **L27867** **Part 11**
PBM: 873 2828 A *PBM above SD: 10.000 m*
GPS Bench Mark: 873 2828 A *MSL above SD: 9.461 m*
GPS Observation Frequency: Every year *Last GPS Observation Performed: 3/11*
Dive Inspection Frequency: Every year *Last Dive: 3/11*

1. Coordinate requirements with the COASTAL Program Manager, and the Weeks Bay Project Manager, Virginia Dentler. Notify NERRS personnel prior to arrival.

8747437 Bay Waveland Yacht Club, MS
PBM: 874 7437 TIDAL 1 (BH0937)
GPS Bench Mark: 876 8094 E (AB7179)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27868

Part 3

PBM above SD: 2.473 m
MSL above SD: 0.990 m

Last GPS Observation Performed: 09/10
Last Dive: 08/11

1. Contact the phone company to verify service or replace IP modem.
2. Measure the elevation of the wind and air temperature sensors above Met SRM.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8760922 Pilots Station East, SW Pass, LA
PBM: 876 0922 C
GPS Bench Mark: 876 0922 C
GPS Observation Frequency: Every year
Dive Inspection Frequency: Every year

L27869

Part 2

PBM above SD: 10.000 m
MSL above SD: 9.361 m

Last GPS Observation Performed: 09/11
Last Dive: 09/11

1. Recover Bench Marks 876 0922 D and 876 0922 E TIDAL.
2. Provide the handheld GPS position in DDMMSS.S format for Bench Mark 876 0922 D.
3. Take a setting photo of Bench Mark 876 0922 G.
4. Measure the elevation of the wind and air temperature sensors above Met SRM.
5. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8761305 Shell Beach, LA
PBM: 876 1305 E
GPS Bench Mark: 876 1305 D
GPS Observation Frequency: Every year
Dive Inspection Frequency: Every year

L27869

Part 35

PBM above SD: 10.000m
MSL above SD: 9.744m

Last GPS Observation Performed: 09/11
Last Dive: 09/11

1. Coordinate with LSRC and NGS for the installation of a CORS site on the Sentinel – ED engineers to manage this task.
2. Include Bench Mark 876 1305 A in level run.
3. Measure the elevation of the wind and air temperature sensors above Met SRM. Measure the elevation of the barometer above station datum.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8761724 Grand Isle, LA**PBM:** 10 (AT0687)**GPS Bench Mark:** 876 1724 TIDAL 11 (AT0685)**GPS Observation Frequency:** Every year**Dive Inspection Frequency:** Every year**L27869****Part 1****PBM above SD:** 2.810 m**MSL above SD:** 1.980 m**Last GPS Observation Performed:** 10/11**Last Dive:** 10/11

1. Measure the elevation of the wind and air temperature sensors above Met SRM.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8761927 USCG New Canal Station, LA**PBM:** ALCO (BJ1342)**GPS Bench Mark:** ALCO (BJ1342)**GPS Observation Frequency:** Every year**Dive Inspection Frequency:** Every year**L27869****Part 10****PBM above SD:** 3.149 m**MSL above SD:** 1.375 m**Last GPS Observation Performed:** 11/10**Last Dive:** 11/10

1. **Unresolved From 2011 Project Instructions:** Recover and level Bench Marks 876 1927 A, 876 1927 B, and X 374.
2. **Unresolved From 2011 Project Instructions:** Provide the handheld GPS positions in DDMSS.S format for Bench Marks ALCO, 876 1927 A, 876 1927 B, and X 374.
3. **Unresolved From 2011 Project Instructions:** Take setting and general location photos of all bench marks; and take face photos of Bench Marks 876 1927 A, 876 1927 B, and X 374.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8762075 Port Fourchon, LA**PBM:** 876 2075 A**GPS Bench Mark:** 876 2075 A**GPS Observation Frequency:** Every year**Dive Inspection Frequency:** Every year**L27869****Part 33****PBM above SD:** 10.000 m**MSL above SD:** 9.183 m**Last GPS Observation Performed:** 10/11**Last Dive:** 10/11

1. No additional requirements.

8762372 East Bank 1, Bayou LaBranche, LA (COASTAL) L27869 Part 3
PBM: 876 2372 E **PBM above SD:** 10.000 m
GPS Bench Mark: 876 2372 E **MSL above SD:** 9.887 m
GPS Observation Frequency: Every year **Last GPS Observation Performed:** 11/10
Dive Inspection Frequency: Every year **Last Dive:** 11/10

1. Please coordinate the annual inspection with the COASTAL Program Manager.
2. Install a full met sensor suite for the upgrade to NWLON status.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8762482 West Bank 1, Bayou Gauche, LA (COASTAL) L27869 Part 4
PBM: 876 2482 A **PBM above SD:** 10.000 m
GPS Bench Mark: 876 2482 G **MSL above SD:** 9.662 m
GPS Observation Frequency: Every year **Last GPS Observation Performed:** 11/11
Dive Inspection Frequency: Every year **Last Dive:** 11/11

1. Please coordinate the annual inspection with the COASTAL Program Manager.
2. **Unresolved From 2011 Project Instructions:** Take setting photos of Bench Mark 876 2482 G.
3. **Unresolved From 2011 Project Instructions:** Contact the phone company to troubleshoot the phone problem.
4. Measure the elevation of the wind and air temperature sensors above Met SRM. Measure the elevation of the barometer above station datum.
5. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8764044 Berwick, LA L27869 Part 34
PBM: 876 4044 E **PBM above SD:** 5.000 m
GPS Bench Mark: 876 4044 E **MSL above SD:** 5.934 m
GPS Observation Frequency: Every year **Last GPS Observation Performed:** 01/11
Dive Inspection Frequency: Every year **Last Dive:** 12/10

1. Bench Marks 876 4044 A and 876 4044 B are unstable and are being dropped from the published list. Remove them, note them as destroyed, and ship them back to FOD.
2. Install seven 3D rod marks, going North along River Road, with the designations 876 4044 F, 876 4044 G, 876 4044 H, 876 4044 J, 876 4044 K, 876 4044 M, and 876 4044 N.
3. Measure the elevation of the wind and air temperature sensors above Met SRM. Measure the elevation of the barometer above station datum.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8764227 LAWMA, Amerada Pass, LA (COASTAL) L27869 Part 11
PBM: 876 4227 A **PBM above SD:** 8.759 m
GPS Bench Mark: GPS GAGE 36 (DJ9384) **MSL above SD:** 7.374 m
GPS Observation Frequency: Every year **Last GPS Observation Performed:** 07/11
Dive Inspection Frequency: Every year **Last Dive:** 06/11

1. Please coordinate the annual inspection with the COASTAL Program Manager, and the LAWMA Project Lead - Carolyn Lindley.
2. Coordinate with LSRC and NGS for the installation of a CORS site on the Sentinel – ED engineers to manage this task.
3. Include Bench Mark 876 4227 E in the leveling run.
4. Measure the elevation of the wind and air temperature sensors above Met SRM.
5. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8766072 Freshwater Canal Locks, LA L27869 Part 8
PBM: 876 6072 A (DJ9334) **PBM above SD:** 8.887m
GPS Bench Mark: 876 6072 C **MSL above SD:** 6.773m
GPS Observation Frequency: Every year **Last GPS Observation Performed:** 10/10
Dive Inspection Frequency: Every year **Last Dive:** None

1. **Unresolved From 2011 Project Instructions:** Take a face photo of Bench Mark 24 R.
2. **Unresolved From 2011 Project Instructions:** Take setting photo of Bench Marks 8766072 A, 876 6072 B, and 876 6072 C.
3. Measure the elevation of the wind and air temperature sensors above Met SRM.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

2.6. Air-Sea Systems - Task XXVIII: Lower Mississippi River PORTS®

Jim Lewis, Task Manager/Technical Representative (TR)

8760721 Pilottown, LA (PORTS)

L27869

Part 40

PBM: 876 0721 D

PBM above SD: 1.666 m

GPS Bench Mark: 876 0721 D

MSL above SD: 1.553 m

GPS Observation Frequency: Every year

Last GPS Observation Performed: 07/11

Dive Inspection Frequency: Every year

Last Dive: 07/11

1. Measure the elevation of the wind and air temperature sensors above Met SRM.
2. Measure the elevation of the barometer above station datum.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8761955 Carrollton, LA (PORTS)

L27869

Part 36

PBM: DISTRICT 1 A (AU2196)

PBM above LWRP: 3.075 m

GPS Bench Mark: DISTRICT 1 A (AU2196)

MSL above SD: Unknown

GPS Observation Frequency: Every year

Last GPS Observation Performed: 10/11

Dive Inspection Frequency: Every year

Last Dive: 10/10

The PBM elevation is set to Mississippi River-LWRP datum for this station.

1. No additional requirements.

8761847 Crescent City Bridge, LA (PORTS)

Air Gap Station

1. No additional requirements.

8762002 Huey Long Bridge, LA (PORTS)

Air Gap Station

AN ANNUAL INSPECTION WAS NOT PERFORMED DURING CY2011

1. No additional requirements.

2.8. Air-Sea Systems - Task 11-05: Mobile PORTS®
Brad Wynn, Task Manager/Technical Representative (TR)

8734673 Fort Morgan, AL (PORTS)

Met Only Station

AN ANNUAL INSPECTION WAS NOT PERFORMED DURING CY2011

1. Measure the elevation of the wind sensor above Met SRM.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
3. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level). Note elevation in comments section.
4. Take station photos showing the met sensors.

8735180 Dauphin Island, AL (PORTS)

L27867

Part 1

PBM: 873 5180 TIDAL 1 (BH1756)

PBM above SD: 6.288 m

GPS Bench Mark: 873 5180 21D – 2E

MSL above SD: 1.049 m

GPS Observation Frequency: Every year

Last GPS Observation Performed: 09/11

Dive Inspection Frequency: Every year

Last Dive: 09/11

1. The platform needs to have some reworking of materials and bracing of some of the handrails.
2. Include Bench Marks 873 5180 C TIDAL and 873 5180 E in level run.
3. Provide the latitude and longitude of Bench Mark 873 5180 TIDAL 4 in DDMSS.S format.
4. Measure the elevation of the wind and air temperature sensors above Met SRM.
5. Measure the elevation of the barometer and water temperature sensors above station datum.
6. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8736163 Middle Bay Port, AL (PORTS)

Visibility Only Station

AN ANNUAL INSPECTION WAS NOT PERFORMED DURING CY2011

1. Measure the elevation of the visibility, relative humidity, and air temperature sensors above Met SRM.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report. The Met Team suggests using a bolt at the base of the met tower.

8736897 US Coast Guard Sector, AL (PORTS)**L27867****Part 7****PBM:** 873 6897 A**PBM above SD:** 10.000 m**GPS Bench Mark:** 873 6897 C**MSL above SD:** 8.986 m**GPS Observation Frequency:** Every year**Last GPS Observation Performed:** 12/10**Dive Inspection Frequency:** Every year**Last Dive:** 12/09

1. **Unresolved From 2010 and 2011 Project Instructions:** Include Bench Mark LAWLER in the level run as this mark has not been leveled since 2007.
2. **Unresolved From 2010 and 2011 Project Instructions:** Provide the handheld GPS positions in DDMMSS.S format for all bench marks.
3. **Unresolved From 2010 and 2011 Project Instructions:** Take face photo of Bench Mark LAWLER.
4. Measure the elevation of the wind and air temperature sensors above Met SRM.
5. Measure the elevation of the barometer and water temperature sensors above station datum.
6. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8737005 Pinto Island, AL (PORTS)**Visibility Only Station****AN ANNUAL INSPECTION WAS NOT PERFORMED DURING CY2011**

1. Measure the elevation of the visibility, relative humidity and air temperature sensors above Met SRM.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report. The Met Team suggests using a bolt at the base of the met tower.

8737048 Mobile State Docks, AL (PORTS)**L27867****Part 10****PBM:** 873 7048 C**PBM above SD:** 2.083 m**GPS Bench Mark:** 873 7048 E**MSL above SD:** 0.695 m**GPS Observation Frequency:** Every year**Last GPS Observation Performed:** 09/11**Dive Inspection Frequency:** Every year**Last Dive:** 09/09

1. **Unresolved from 2010 Project Instructions:** Update the bench mark sketch with J 445 and 873 7048 SHANK.
2. Measure the elevation of the wind and air temperature sensors above Met SRM.
3. Measure the elevation of the barometer above MSL (Mean Sea Level).
4. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.

2.9. Woods Hole Group - Task 11-07: NY/NJ PORTS®

Brad Wynn, Task Manager/Technical Representative (TR)

8517986 Verrazano Narrows Bridge Air Gap, NY (PORTS)

Air Gap Station

1. No additional requirements.

8518750 The Battery, NY (PORTS)

L27856

Part 3

PBM: 851 8750 TIDAL 7 (AB6736)

PBM above SD: 5.470 m

GPS Bench Mark: R 340 (KV0587)

MSL above SD: 1.785 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 09/09

Dive Inspection Frequency: Every year

Last Dive: 08/10

1. Measure the elevation of the air temperature sensor above the Met SRM (the Met Team suggests using a location on the pier surface).
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8519461 Bayonne Bridge Air Gap, NY (PORTS)

Air Gap Station

AN ANNUAL INSPECTION WAS NOT PERFORMED DURING CY2011

1. No additional requirements.

8519483 Bergen Point, NY (PORTS)

L27856

Part 4

PBM: 851 9483 B TIDAL (AH6737)

PBM above SD: 6.428 m

GPS Bench Mark: 851 9483 E

MSL above SD: 2.137 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 09/09

Dive Inspection Frequency: Every year

Last Dive: 08/10

1. **Unresolved from 2010 Project Instructions:** Relocate the met sensor tower to resolve the obstruction of winds at the present site. (Not allowed to climb present tower - per Neeson)
2. **Unresolved from 2009 Project Instructions:** Repair AC feed at bulkhead. Contact property owner to repair AC.
3. **Unresolved from 2010 Project Instructions:** Recover or establish and level three surface marks, designation/stamping as follows if new mark(s): 851 9483 H/9483 H 2011, 851 9483 J/9483 J 2011, and 851 9483 K/9483 K 2011.
4. Measure the elevations of the wind and air temperature sensors above the Met SRM (the Met Team suggests using a bolt at base of tower).
5. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

2.10. Woods Hole Group - Task 08-03: Delaware River and Bay PORTS®

Brad Wynn, Task Manager/Technical Representative (TR)

8537121 Ship John Shoal, NJ (PORTS)

L27857

Part 4

PBM: 853 7121 TIDAL 1

PBM above SD: 8.666 m

GPS Bench Mark: N/A

MSL above SD: 6.529 m

GPS Observation Frequency: (Waived – not feasible)

Dive Inspection Frequency: Every year

Last Dive: 08/10

1. No additional requirements.

8538886 Tacony-Palmyra, NJ (PORTS)

L27857

Part 5

PBM: 853 8886 A

PBM above SD: 10.084 m

GPS Bench Mark: N/A

MSL above SD: 6.403 m

GPS Observation Frequency: (Waived – not feasible)

Dive Inspection Frequency: Every year

Last Dive: 09/10

1. Replace DCP 2 in FY 12. The Xpert Dark failed during FY11 the firmware upgrade process.
2. Measure the elevation of the air temperature above the Met SRM (the Met Team suggests a location on the DCP mounting surface).
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8539094 Burlington Bridge, NJ (PORTS)

L27857

Part 6

PBM: 853 9094 F

PBM above SD: 9.731 m

GPS Bench Mark: N/A

MSL above SD: 6.349 m

GPS Observation Frequency: (Waived – not feasible)

Dive Inspection Frequency: Every year

Last Dive: 07/11

1. To achieve the minimum number of 5 bench marks at this station, recover or establish and level one surface mark, designation/stamping as follows if new mark: 853 9094 G/9094 G 2011. Obtain permission from the bridge owners prior to visiting the station.
2. Treat wind sensors as a stand-alone station per the Met Guidelines document. Measure the elevations of the wind sensors above the water surface and document in the comments section of the site report.
3. Measure the elevation of the air temperature sensor above the base of the mounting structure.

8540433 Marcus Hook, PA (PORTS)
PBM: 854 0433 E
GPS Bench Mark: 854 0433 E
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27858

Part 1

PBM above SD: 10.000 m
MSL above SD: 7.539 m
Last GPS Observation Performed: 09/09
Last Dive: Unknown

1. Remove the conductivity sensor well.
2. Recover or establish and level two surface marks with the designation/stamping as follows: 854 0433 H/0433 H 2012 and 854 0433 J/0433 J 2012.
3. Measure the elevation of the air temperature sensor above the Met SRM (the Met Team suggests using 854 0433 NO STAMPING).
4. Verify that 854 0433 NO STAMPING was used as Met SRM in the comments section of the site report.

8548989 Newbold, PA (PORTS)
PBM: 854 8989 A
GPS Bench Mark: 854 8989 A
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27858

Part 3

PBM above SD: 10.000 m
MSL above SD: 5.693 m
Last GPS Observation Performed: 09/09
Last Dive: 09/10

1. No additional requirements.

8551762 Delaware City, DE (PORTS)
PBM: 855 1762 C
GPS Bench Mark: 855 1762 E
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27859

Part 1

PBM above SD: 10.000 m
MSL above SD: 7.727 m
Last GPS Observation Performed: 09/09
Last Dive: 08/10

1. Measure the elevations of the wind and air temperature sensors above the Met SRM (the Met Team suggests using a bolt at the base of the met tower).
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8555889 Brandywine Shoal Light, DE (PORTS)
PBM: 855 5889 A
GPS Bench Mark: N/A
GPS Observation Frequency: (Waived – not feasible)
Dive Inspection Frequency: Every year

L27859

Part 3

PBM above SD: 10.3975 m
MSL above SD: 6.583 m
Last Dive: 08/10

1. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

2.11. Woods Hole Group - Task 08-02: Lake Charles PORTS®

Jim Lewis, Task Manager/Technical Representative (TR)

8767816 Lake Charles, LA (PORTS)

L27869

Part 9

PBM: A 269 (BK1489)

PBM above SD: 10.000 m

GPS Bench Mark: CIVIC (BK3291)

MSL above SD: 8.283m

GPS Observation Frequency: Every year

Last GPS Observation Performed: 08/11

Dive Inspection Frequency: Every year

Last Dive: 08/11

1. Investigate moving the Aquatrak protective well.
2. Measure the elevation of the wind and air temperature sensors above Met SRM.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8767931 I-210 Bridge Air Gap, LA (PORTS)

Air Gap Station

AN ANNUAL INSPECTION WAS NOT PERFORMED DURING CY2011

1. No additional requirements.

8767961 Bulk Terminal, LA (PORTS)

L27869

Part 15

PBM: 876 7961 C

PBM above SD: 10.000 m

GPS Bench Mark: 876 7961 C

MSL above SD: 7.278 m

GPS Observation Frequency: Every year

Last GPS Observation Performed: 08/11

Dive Inspection Frequency: Every year

Last Dive: 09/10

1. No additional requirements

8768094 Calcasieu Pass, East Jetty LA (PORTS)

L27869

Part 5

PBM: 876 8094 E (DJ9387)

PBM above SD: 9.9670 m

GPS Bench Mark: 876 8094 E TIDAL (DJ9387)

MSL above SD: 8.555 m

GPS Observation Frequency: Every year

Last GPS Observation Performed: 08/11

Dive Inspection Frequency: Every year

Last Dive: 08/11

1. **Unresolved from 2010 Project Instructions:** Coordinate with the Louisiana Spatial Reference Center (LSRC) and NGS to install a CORS site on the Sentinel – ED engineers to manage this task.
2. Recover and level Bench Mark 876 8094 D
3. Measure the elevation of the wind and air temperature sensors above Met SRM.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

2.12. Texas A&M DNR - Task XXIV: Gulfport and Pascagoula PORTS®

John Stepnowski, Task Manager/Technical Representative (TR)

8741003 Petit Bois Island, MS (PORTS)

Met Only Station

1. Measure the elevation of the wind and air temperature sensors above Met SRM.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
3. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level).

8741041 Pascagoula Dock E, MS (PORTS)

L27868

Part 7

PBM: USACE RM 1 TIDAL

PBM above SD: 10.000 m

GPS Bench Mark: 874 1041 E

MSL above SD: 6.825 m

GPS Observation Frequency: Every year

Last GPS Observation Performed: 04/11

Dive Inspection Frequency: Every year

Last Dive: 04/11

1. No additional requirements

8741094 Range A Rear, MS (PORTS)

Met Only Station

1. Measure the elevation of the wind and air temperature sensors above Met SRM.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
3. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level).

8741501 Dock C, MS (PORTS)

Met Only Station

1. Measure the elevation of the wind and air temperature sensors above Met SRM.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
3. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level).

8741533 Pascagoula NOAA Lab, MS (PORTS)**L27868****Part 6****PBM:** 874 1533 B**PBM above SD:** 9.145 m**GPS Bench Mark:** 874 1533 A**MSL above SD:** 6.901 m**GPS Observation Frequency:** Every year**Last GPS Observation Performed:** 04/11

Dive Inspection Frequency: Every year

Last Dive: 04/11

1. Work with DNR and the Task Manager to provide an engineering design for the upgrade of this station to NWLON status. It needs an elevated frame for the DCPs and the acoustic well needs to be raised. The design height should correspond to Cat 4 storm surge heights. A full met package shall also be installed unless wind sensors are unfeasible. Present site is not compatible for the installation of wind sensors. JRS 11/10/11
2. Measure the elevation of the water temperature sensor above station datum.

8744707 Ship Island, MS (PORTS)**Met Only Station**

1. Measure the elevation of the wind and air temperature sensors above Met SRM.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
3. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level). Note elevation in comments section.

8745651 West Pier, MS (PORTS)**Met Only Station**

1. Measure the elevation of the wind and air temperature sensors above Met SRM.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
3. Measure the elevation of the barometer above the water level to obtain a height above MSL (Mean Sea Level). Note elevation in comments section.

2.13. Texas A&M DNR - Task 09-02: Houston/Galveston PORTS®

Jim Lewis, Task Manager/Technical Representative (TR)

8770613 Morgans Point, TX (PORTS)

L27870

Part 8

PBM: E 1201 (AW1556)

PBM above SD: 5.9855 m

GPS Bench Mark: 877 0613 TIDAL 10 (AW4857)

MSL above SD: 1.813 m

GPS Observation Frequency: Every year

Last GPS Observation Performed: 03/11

Dive Inspection Frequency: Every year

Last Dive: 03/11

1. Measure the elevation of the wind and air temperature sensors above Met SRM.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8771013 Eagle Point, TX (PORTS)

L27870

Part 13

PBM: 877 1013 B

PBM above SD: 3.913 m

GPS Bench Mark: 877 1013 A (AJ4424)

MSL above SD: 1.446 m

GPS Observation Frequency: Every year

Last GPS Observation Performed: 03/11

Dive Inspection Frequency: Every year

Last Dive: 04/10

1. **Unresolved from 2009 Project Instructions:** Determine status and report on Bench Marks EAGLE POINT 1932, EAGLE POINT NO 1 and NO 2 1932, 4 1973 and 5 1973 at the old site north of the present site.
2. **Unresolved from 2009 Project Instructions:** Provide the handheld GPS positions in DDMMSS.S format for Bench Mark 877 1013 F.
3. Measure the elevation of the wind and air temperature sensors above Met SRM.
4. Measure the elevation of the barometer above station datum.
5. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8771341 Galveston North Jetty, TX (PORTS)

L27870

Part 41

PBM: 877 1314 A

PBM above SD: 4.180 m

GPS Bench Mark: 877 1341 J

MSL above SD: 3.082 m

GPS Observation Frequency: Every year

Last GPS Observation Performed: Unknown

Dive Inspection Frequency: Every year

Last Dive: 04/11

1. Measure the elevation of the wind and air temperature sensors above Met SRM.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8771450 Galveston Pier 21, TX (PORTS)

PBM: 7.151 (AW0433)

GPS Bench Mark: 877 1450 B

GPS Observation Frequency: Every year

Dive Inspection Frequency: Every year

L27870

Part 2

PBM above SD: 2.856 m

MSL above SD: 1.588 m

Last GPS Observation Performed: 11/10

Last Dive: 11/07

1. **Unresolved from 2011 Project Instructions:** Level to the PBM and Bench Marks 877 1450 D, 877 1450 E, 877 1450 F, 877 1450 TIDAL 40 RESET, and 877 1450 TIDAL 41 RESET (these marks have not been hit since 2005).

2.14. Texas A&M DNR - Task 10-04: Texas Stations

Jim Lewis, Task Manager/Technical Representative (TR)

8770570 Sabine Pass North, TX (PORTS)

L27870

Part 1

PBM: 877 0570 A TIDAL (AV1014)

PBM above SD: 3.264 m

GPS Bench Mark: 877 0570 A TIDAL (AV1014)

MSL above SD: 1.343 m

GPS Observation Frequency: Every year

Last GPS Observation Performed: 11/10

Dive Inspection Frequency: Every year

Last Dive: 11/09

1. Measure the elevation of the wind and air temperature sensors above Met SRM.
2. Measure the elevation of the barometer above station datum.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8770822 Texas Point, TX

L27870

Part 11

PBM: 877 0822 1

PBM above SD: 5.000 m

GPS Bench Mark: 877 0822 F

MSL above SD: Unavailable

GPS Observation Frequency: Every year

Last GPS Observation Performed: 09/11

Dive Inspection Frequency: Every year

Last Dive: 08/11

1. No additional requirements.

8772447 USCG Freeport, TX

L27870

Part 47

PBM: 877 2447 A TIDAL

PBM above SD: 10.000 m

GPS Bench Mark: 877 2447 E TIDAL

MSL above SD: 8.720 m

GPS Observation Frequency: Every year

Last GPS Observation Performed: 11/11

Dive Inspection Frequency: Every year

Last Dive: 11/11

1. No additional requirements.

8774770 Rockport, TX

L27870

Part 5

PBM: 877 4770 TIDAL 8 (AN1877)

PBM above SD: 3.385 m

GPS Bench Mark: 877 4770 B

MSL above SD: 2.025 m

GPS Observation Frequency: Every year

Last GPS Observation Performed: 09/11

Dive Inspection Frequency: Every year

Last Dive: 09/11

1. The station is under consideration for relocation to an elevated platform outside the harbor breakwater, pending identification of funding.
2. Measure the elevation of the barometer above station datum.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
4. Provide photos showing Met instrumentation.

8775870 Corpus Christi, TX**PBM:** 877 5870 A TIDAL (AC8459)**GPS Bench Mark:** 877 5870 H TIDAL (AH1762)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27870****Part 6****PBM above SD:** 9.098 m**MSL above SD:** 6.635 m**Last GPS Observation Performed:** 03/07**Last Dive:** 03/10

1. Recover and level Bench Mark 877 5870 F TIDAL.
2. Take location photos of Bench Marks 877 5870 C TIDAL, 877 5870 E TIDAL, 877 5870 G TIDAL, 877 5870 H TIDAL, 877 5870 K TIDAL and HOLIDAY AZ MK. Please include a witness post/cone near the bench mark and have landscape or buildings/landmarks in the picture when taking location photos. This will help identify the bench mark location.
3. Measure the elevation of the wind and air temperature sensors above Met SRM.
4. Measure the elevation of the barometer and the water temperature sensor above station datum.
5. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8779770 Port Isabel, TX**PBM:** 877 9770 TIDAL 10 (AB1227)**GPS Bench Mark:** X 1406 (AB1225)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27870****Part 7****PBM above SD:** 4.276 m**MSL above SD:** 1.423 m**Last GPS Observation Performed:** 05/07**Last Dive:** 10/11

1. No additional requirements.

2.15. FOD/AOB - Great Lakes

2.15.1. St. Lawrence River

8311030 Ogdensburg, NY

PBM: 831 1030 A (PH0768)

GPS Bench Mark: 831 1030 H (DE7800)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27880

Part 1

PBM Elevation (Dynamic): 84.6140 m

Hydraulic Corrector: +0.000 m

Last GPS Observation Performed: 06/10

Last Dive: 05/07

1. No additional requirements.

8311062 Alexandria Bay, NY

PBM: 831 1062 LAND (LX4057)

GPS Bench Mark: 831 1062 LMN (DE7816)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27880

Part 2

PBM Elevation (Dynamic): 86.1691 m

Hydraulic Corrector: +0.000 m

Last GPS Observation Performed: 06/10

Last Dive: 05/11

1. Please provide a second directional photo of Bench Marks 831 1062 LMN, 831 1062 DEE and 831 1062 JAMISON. Provide face, setting and two directional photos for Bench Mark 831 1062 B.

2.15.2. Lake Ontario

9052000 Cape Vincent, NY

PBM: 905 2000 CAPE (PJ0033)
GPS Bench Mark: 905 2000 F (AH9230)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27881

Part 1

PBM Elevation (Dynamic): 77.0712 m
Hydraulic Corrector: +0.008 m
Last GPS Observation Performed: 06/10
Last Dive: 05/07

1. Include Bench Mark 905 2000 F in the level run.

9052030 Oswego, NY (MASTER)

PBM: 905 2030 LAKE (OF0658)
GPS Bench Mark: 905 2030 D (DJ5176)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27881

Part 2

PBM Elevation (Dynamic): 77.4870 m
Hydraulic Corrector: +0.000 m
Last GPS Observation Performed: 06/10
Last Dive: 05/09

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, and contact information on the station report.
2. Confirm that Bench Marks FORT, S 25, and WALL are searched for but not recovered and Bench Mark GARAGE has been destroyed. If possible, provide photographic evidence.

9052058 Rochester, NY

PBM: 905 2058 SUB (OF1082)
GPS Bench Mark: 905 2058 K (AH9232)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27881

Part 3

PBM Elevation (Dynamic): 76.8041 m
Hydraulic Corrector: +0.006 m
Last GPS Observation Performed: 06/10
Last Dive: 05/09

1. Please provide a second directional photo of Bench Marks 905 2058 H, FENCE and BROCTON.

9052076 Olcott, NY

PBM: 905 2076 WEST (OG0098)
GPS Bench Mark: 905 2076 H (AH9233)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27881

Part 4

PBM Elevation (Dynamic): 77.4920 m
Hydraulic Corrector: +0.008 m
Last GPS Observation Performed: 06/10
Last Dive: 06/07

1. Confirm Bench Marks 9052076 A, WL 125, WALL and CLINTON were searched for but not recovered.

2.15.3. Niagara River

9063007 Ashland Avenue, NY

PBM: 906 3007 POOL (OG0229)

GPS Bench Mark: N/A

GPS Observation Frequency: (Waived – not feasible)

Dive Inspection Frequency: Every year

L27882

Part 1

PBM Elevation (Dynamic): 111.4279 m

Hydraulic Corrector: +0.000 m

Last GPS Observation Performed: N/A

Last Dive: 04/11

1. Recover and provide face, setting, and two directional photos for Bench Mark N 27.

9063009 American Falls, NY

PBM: 906 3009 FRONTIER (OG0223)

GPS Bench Mark: W 411 (OG0350)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Diving Not Allowed

L27882

Part 2

PBM Elevation (Dynamic): 171.8554 m

Hydraulic Corrector: +0.000 m

Last GPS Observation Performed: Unknown

1. Include Bench Marks SMC 26, W 411 and BUFFALO AVENUE in the level run.

9063012 Niagara Intake, NY

PBM: 906 3012 Y 411 (OG0352)

GPS Bench Mark: 906 3012 RAIL (OG0217)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Diving Not Allowed

L27882

Part 3

PBM Elevation (Dynamic): 174.4220 m

Hydraulic Corrector: +0.000 m

Last GPS Observation Performed: 06/10

1. Inspect the roof for leaks.
2. Recover and provide face, setting, and two directional photos for Bench Marks 906 3012 GATE NYNPA and ALKA. Note if searched for and not recovered.

2.15.4. Lake Erie

9063020 Buffalo, NY

PBM: 906 3020 MACHINE (NC0403)

GPS Bench Mark: 906 3020 H (AH9234)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27883

Part 1

PBM Elevation (Dynamic): 176.5548 m

Hydraulic Corrector: -0.026 m

Last GPS Observation Performed: 06/10

Last Dive: 05/09

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.

9063028 Sturgeon Point, NY

PBM: 906 3028 WATER (NC0430)

GPS Bench Mark: 906 3028 L (DE7802)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27883

Part 2

PBM Elevation (Dynamic): 197.5510 m

Hydraulic Corrector: -0.023 m

Last GPS Observation Performed: 06/10

Last Dive: 04/04

1. Recover and provide face, setting and two directional photos for Bench Marks 906 3028 SERVAIS and STURGEON PT RM 2. Confirm if searched for not recovered, or destroyed. If possible, provide photographic evidence.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9063038 Erie, PA

PBM: 906 3083 POPLAR (ND0161)

GPS Bench Mark: D 362 (ND0163)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27883

Part 3

PBM Elevation (Dynamic): 174.6781 m

Hydraulic Corrector: -0.025 m

Last GPS Observation Performed: 06/10

Last Dive: 05/08

1. No additional requirements.

9063053 Fairport, OH (MASTER)**L27883****Part 4****PBM:** K 321 (MB1625)**PBM Elevation (Dynamic):** 175.9180 m**GPS Bench Mark:** 906 3053 F (AH9235) & X 323 (MB1620) **Hydraulic Corrector:** +0.000 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/10**Dive Inspection Frequency:** Every 2 years**Last Dive:** 04/08

1. Subsidence of all bench marks by 5 or more centimeters due to salt mining was verified by NGS during a geodetic level connection to the National Spatial Reference System (NSRS) in September 2006. Bench mark heights need to be re-evaluated by CO-OPS. Coordinate with NGS to connect again in 2012 to NSRS to monitor movement. Indicate all findings, actions, contact, and other information on the station report.
2. Provide met sensor photos.

9063063 Cleveland, OH**L27883****Part 5****PBM:** G 321 (MB1563)**PBM Elevation (Dynamic):** 177.7308 m**GPS Bench Mark:** G 321 (MB1563)**Hydraulic Corrector:** +0.010 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/10**Dive Inspection Frequency:** Every 2 years**Last Dive:** 04/08

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
2. Provide elevation of base of stand-alone Met station above mean sea level (MSL) by measuring down to the water level and noting date/time.

9063079 Marblehead, OH**L27883****Part 6****PBM:** Z 317 (MC0984)**PBM Elevation (Dynamic):** 177.2379 m**GPS Bench Mark:** 906 3079 J (AH9236)**Hydraulic Corrector:** -0.006 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/10**Dive Inspection Frequency:** Every year**Last Dive:** 04/08

1. Include Bench Mark 906 3079 F in the level run.
2. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.

9063085 Toledo, OH**L27883****Part 7****PBM:** 906 3085 NAVAL (MC0269)**PBM Elevation (Dynamic):** 175.4592 m**GPS Bench Mark:** 906 3085 G (AH9237)**Hydraulic Corrector:** -0.005 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/10**Dive Inspection Frequency:** Every 2 years**Last Dive:** 04/09

1. Include Bench Marks WL 105, POL 157.14 and STEEL PILE in the level run.

9063090 Fermi Power Plant, MI

PBM: 906 3090 POWER (MC0873)

GPS Bench Mark: 906 3090 G (AH9238)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27883

Part 8

PBM Elevation (Dynamic): 177.5893 m

Hydraulic Corrector: +0.023 m

Last GPS Observation Performed: 06/10

Last Dive: 06/03

1. Replace XPERT display module.
2. Set surface disk bench mark on station foundation.
3. Please provide a second directional photo of Bench Marks 906 3090 POWER, 906 3090 ATOMIC USE, 906 3090 E, 906 3090 EXIBITS USLS, 906 3090 F, F 234, and 9063090 G. Provide face, setting and two directional photos for Bench Mark STEEL PILE USLS.
4. Verify, or upgrade to, the new style XPERT DCP GPS antenna and XPERT external BEI display.

2.15.5. Detroit River

9044020 Gibraltar

PBM: M 234 (NE0857)

GPS Bench Mark: H 115 X (NE0516)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27884

Part 1

PBM Elevation (Dynamic): 176.6298 m

Hydraulic Corrector: 0.000 m

Last GPS Observation Performed: 06/10

Last Dive: 11/08

1. Verify, or upgrade to, the new style XPERT DCP GPS antenna and XPERT external BEI display.

9044030 Wyandotte, MI

PBM: 904 4030 CHIEF (NE0577)

GPS Bench Mark: Select most stable mark observable

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27884

Part 2

PBM Elevation (Dynamic): 176.1190 m

Hydraulic Corrector: 0.000 m

Last GPS Observation Performed: Unknown

Last Dive: 11/08

1. No additional requirements.

9044036 Fort Wayne, MI

PBM: 904 4036 RAMP (NE0622)

GPS Bench Mark: FORT WAYNE A (AA8055)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27884

Part 3

PBM Elevation (Dynamic): 175.2317 m

Hydraulic Corrector: 0.000 m

Last GPS Observation Performed: 06/10

Last Dive: 11/08

1. Install new gauge table. The current gauge table is old and may start to warp, effecting data quality. Note: Work may be performed by Great Lakes contractor prior to annual inspection.
2. Outside of the block building needs to be sand blasted or pressure washed and re-painted.
3. Clean up the area immediately surrounding the gauge house.

9044049 Windmill Point, MI

PBM: 904 4049 USPHS (NE0136)

GPS Bench Mark: Select most stable mark observable

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27884

Part 4

PBM Elevation (Dynamic): 176.5770 m

Hydraulic Corrector: 0.000 m

Last GPS Observation Performed: Unknown

Last Dive: 11/08

1. Obtain permission to: establish, describe, and connect via levels one 3D rod mark, designation/stamping: 904 4049 M/4049 M 2009. This mark should be open to the sky for GPS observations.
2. Confirm destruction of Bench Mark W. If possible, provide photographic evidence.

2.15.6. Lake St Clair

9034052 St. Clair Shores, MI (MASTER)
PBM: 904 4052 FOOD (NE0165)
GPS Bench Mark: N 235 (NE0898)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27885 **Part 1**
PBM Elevation (Dynamic): 176.9698 m
Hydraulic Corrector: 0.000 m
Last GPS Observation Performed: 06/10
Last Dive: 11/08

1. No additional requirements.

2.15.7. St. Clair River

9014070 Algonac, MI **L27664** **Part 1**
PBM: 901 4070 TREAT (NE0255) *PBM Elevation (Dynamic):* 176.8682 m
GPS Bench Mark: Select most stable mark observable *Hydraulic Corrector:* 0.000 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* Unknown
Dive Inspection Frequency: Every year *Last Dive:* 10/08

1. Please confirm Bench Mark RIM is searched for but not recovered.

9014080 St. Clair State Police, MI **L27886** **Part 2**
PBM: A 237 (NE0943) *PBM Elevation (Dynamic):* 176.5847 m
GPS Bench Mark: 901 4080 F (AC9129) *Hydraulic Corrector:* 0.000 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* 06/10
Dive Inspection Frequency: Every 2 years *Last Dive:* 10/08

1. No additional requirements.

9014087 Dry Dock, MI **L27886** **Part 3**
PBM: Z 236 (NE0953) *PBM Elevation (Dynamic):* 180.7617 m
GPS Bench Mark: Select most stable mark observable *Hydraulic Corrector:* 0.000 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* Unknown
Dive Inspection Frequency: Every 2 years *Last Dive:* 10/08

1. Confirm Bench Marks PH 20 and 4087 MANHOLE USLS have been destroyed. If possible, provide photographic evidence.

9014090 Mouth of the Black River, MI (NEW) **L27886** **Part 4**
PBM: Z 43 (NE0088) *PBM Elevation (Dynamic):* 178.9323 m
GPS Bench Mark: 901 4090 D (NE0955) *Hydraulic Corrector:* 0.000 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* 06/10
Dive Inspection Frequency: Every year *Last Dive:* 10/10

1. Confirm Bench Mark 4090 G was destroyed. If possible, provide photographic evidence.

9014096 Dunn Paper, MI L27886 Part 5

PBM: 3060 (NE0081)

PBM Elevation (Dynamic): 179.1206 m

GPS Bench Mark: Select most stable mark observable

Hydraulic Corrector: 0.000 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: Unknown

Dive Inspection Frequency: Every year

Last Dive: 10/10

1. The bulkhead area is subsiding due to the possibility of the bulkhead being undermined. The Spike and ETG may show slight movement due to this subsidence and will need to be tracked in the future maintenance leveling.

9014098 Fort Gratiot, MI

L27886

Part 6

PBM: 901 4098 RETAINING WALL (OJ0009)

PBM Elevation (Dynamic): 179.5533 m

GPS Bench Mark: 901 4098 RETAINING WALL (OJ0009)

Hydraulic Corrector: 0.000 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 06/10

Dive Inspection Frequency: Every 2 years

Last Dive: 09/06

1. No additional requirements.

2.15.8. Lake Huron

9075002 Lakeport, MI

PBM: 907 5002 BURTCH (OJ0036)
GPS Bench Mark: LAKEPORT RM 2 (OJ0599)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27887 **Part 1**
PBM Elevation (Dynamic): 178.7965 m
Hydraulic Corrector: +0.013 m
Last GPS Observation Performed: 06/10
Last Dive: 09/08

1. No additional requirements.

9075014 Harbor Beach, MI (MASTER)

PBM: GRIST (OJ0219)
GPS Bench Mark: LSC 5C93 (OJ0517) & 907 5014 GRIST (OJ0219)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27887 **Part 2**
PBM Elevation (Dynamic): 180.2756 m
Hydraulic Corrector: 0.000 m
Last GPS Observation Performed: 06/10
Last Dive: 09/08

1. Determine the inside and outside intake invert elevations.

9075035 Essexville, MI

PBM: 907 5035 CON (OJ0526)
GPS Bench Mark: ESSEX A (AA8053)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27887 **Part 3**
PBM Elevation (Dynamic): 179.1734 m
Hydraulic Corrector: -0.002 m
Last GPS Observation Performed: 06/10
Last Dive: 08/06

1. Confirm Bench Marks LSC 5 C 1, CORNER and BAKER are searched for but not recovered.

9075065 Alpena, MI

PBM: 907 5065 POST OFFICE (GJ0009)
GPS Bench Mark: 907 5065 G
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27887 **Part 7**
PBM Elevation (Dynamic): 180.1536 m
Hydraulic Corrector: +0.031 m
Last GPS Observation Performed: Unknown
Last Dive: 09/10

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.

9075080 Mackinaw City, MI (NEW)

PBM: J 299 (QK0428)

GPS Bench Mark: 907 5080 STATE DOCK (QK0428)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27887

PBM Elevation (Dynamic): 179.6082 m

Hydraulic Corrector: +0.043 m

Last GPS Observation Performed: 07/10

Last Dive: 09/10

Part 5

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report. Make sure all wiring installed by NGS is run through Panduit and the installation is clean.

9075099 Detour Village, MI (PORTS)

PBM: L 293 (QJ0086)

GPS Bench Mark: DETOUR MARINA (AH9228)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27887

PBM Elevation (Dynamic): 179.7044 m

Hydraulic Corrector: +0.005 m

Last GPS Observation Performed: 06/10

Last Dive: 09/10

Part 6

1. Include Bench Mark SM 34 in the level run.

2.15.9. Lake Michigan

9087023 Ludington, MI

PBM: J 318 (OL0303)

GPS Bench Mark: J 318 (OL0303)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27888

Part 1

PBM Elevation (Dynamic): 177.9833 m

Hydraulic Corrector: +0.087 m

Last GPS Observation Performed: 07/10

Last Dive: 07/09

1. Include Bench Marks 908 7023 WALBAR in the level run. Note for mark 908 7023 WALBAR: Contact marina to access, update recovery notes, and survey to mark.
2. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
3. Provide a face, setting and two directional photos for Bench Mark 908 7023 WALBAR.

9087031 Holland, MI

PBM: W 319 (NG0413)

GPS Bench Mark: 908 7031 J (AH5303)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27888

Part 2

PBM Elevation (Dynamic): 177.5769 m

Hydraulic Corrector: +0.090 m

Last GPS Observation Performed: 07/10

Last Dive: 07/09

1. No additional requirements.

9087044 Calumet Harbor, IL

PBM: 908 7044 COM (ME2189)

GPS Bench Mark: 908 7044 H (AE9231)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27888

Part 3

PBM Elevation (Dynamic): 178.0648 m

Hydraulic Corrector: +0.104 m

Last GPS Observation Performed: 07/10

Last Dive: 07/09

1. Confirm Bench Marks 908 7044 ENG A, and 908 7044 6 are destroyed. If possible, provide photographic evidence.
2. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
3. Provide updated photos of the Met sensor configuration and set up.

9087057 Milwaukee, WI**PBM:** NAVY (OL0278)**GPS Bench Mark:** MILWAUKEE A (AA8061)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L27888****Part 4****PBM Elevation (Dynamic):** 182.9494 m**Hydraulic Corrector:** +0.106 m**Last GPS Observation Performed:** 07/10**Last Dive:** 07/09

1. Gauge house needs interior and door painting plus general maintenance. Contact FOD for more information.
2. Please provide a second directional photo of Bench Marks 908 7057 NAVY, 908 7057 MILWAUKEE A and 908 7057 G. Provide a face, setting and two directional photos for Bench Mark 908 7057 LINCOLN. Confirm if marks are searched for but not recovered or destroyed. If possible, provide photographic evidence. NOTE: Naval Reserve Training Center is closed on weekends, plan maintenance visit accordingly.

9087068 Kewaunee, WI**PBM:** 908 7068 ROD (PM0373)**GPS Bench Mark:** 908 7068 H (AH5304)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27888****Part 5****PBM Elevation (Dynamic):** 177.9684 m**Hydraulic Corrector:** +0.114 m**Last GPS Observation Performed:** 07/10**Last Dive:** 07/09

1. No additional requirements.

9087069 Kewaunee Met, WI Met Only Station

1. No additional requirements.

9087072 Sturgeon Bay Canal, WI**PBM:** 908 7072 GARAGE (PM0361)**GPS Bench Mark:** STURGEON A (AA8057)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L27888****Part 6****PBM Elevation (Dynamic):** 181.8608 m**Hydraulic Corrector:** +0.106 m**Last GPS Observation Performed:** 07/10**Last Dive:** 07/09

1. No additional requirements.

9087079 Green Bay, WI**PBM:** 908 7078 WIS (PN0090)**GPS Bench Mark:** 908 7078 E (PN0840)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27888****Part 7****PBM Elevation (Dynamic):** 179.6563 m**Hydraulic Corrector:** +0.114 m**Last GPS Observation Performed:** 07/10**Last Dive:** 08/08

1. Include Bench Mark 908 7078 G in level run. NOTE: 908 7078 G is located in secure area, requiring special access.
2. Please provide a second directional photo of Bench Mark 908 7078 G

9087088 Menominee, WI**PBM:** 908 7088 D (DI7587)**GPS Bench Mark:** 35 A (DI7590)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27888****Part 9****PBM Elevation (Dynamic):** 178.0211 m**Hydraulic Corrector:** +0.184 m**Last GPS Observation Performed:** 07/10**Last Dive:** 07/09

1. Include Bench Marks TURNING POINT 1, T 208, PILE, WALL and MARATHON in the level run.
2. Fix phone lines and AC drop lines at parking lot this summer. EM work only a temporary fix. Note: from parking lot to new station, used green/white wires and orange/white to blue/white to old station.

9087096 Port Inland, MI**PBM:** 908 7096 G (AC8317)**GPS Bench Mark:** 908 7096 J (DJ5177)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27888****Part 8****PBM Elevation (Dynamic):** 181.3705 m**Hydraulic Corrector:** +0.046 m**Last GPS Observation Performed:** 07/10**Last Dive:** 08/10

1. Include Bench Mark 908 7096 H RESET 2001 in the level run.
2. Please provide a second directional photo of Bench Mark H RESET 2001. Confirm if searched for but not recovered or destroyed. If possible, provide photographic evidence.

2.15.10. St. Marys River

9076024 Rock Cut, MI (PORTS)

PBM: 907 6024 B (DJ5178)

GPS Bench Mark: 907 6024 B (DJ5178)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27889

Part 3

PBM Elevation (Dynamic): 178.0183 m

Hydraulic Corrector: 0.000 m

Last GPS Observation Performed: 06/10

Last Dive: 09/11

1. No additional requirements.

9076027 West Neebish Island, MI (PORTS)

PBM: E 297 (RJ0670)

GPS Bench Mark: 907 6027 DOCK (RJ0186)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27889

Part 6

PBM Elevation (Dynamic): 178.7844 m

Hydraulic Corrector: 0.000 m

Last GPS Observation Performed: Unknown

Last Dive: 09/10

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
2. Verify that Bench Marks 907 6028 H, 907 6028 A and F 297 are searched for but not recovered or destroyed. If possible, provide photographic evidence.

9076033 Little Rapids (NEW), MI (PORTS)

PBM: D 293 (RJ0616)

GPS Bench Mark: FERRY DOCK (RJ0617)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27889

Part 5

PBM Elevation (Dynamic): 178.3058 m

Hydraulic Corrector: 0.000 m

Last GPS Observation Performed: 07/10

Last Dive: 09/10

1. Install and/or inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report. Survey the GPS antenna if the system has been installed.

9076060 U.S. Slip, MI (PORTS)
PBM: C 293 (RJ0613)
GPS Bench Mark: C 293 (RJ0613)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27889 **Part 1**
PBM Elevation (Dynamic): 184.3007 m
Hydraulic Corrector: 0.000 m
Last GPS Observation Performed: 06/10
Last Dive: 01/05

1. Verify the status of Bench Mark IBM 36.
2. Contact Ken Smith, with the COE Soo Area Office @ (906)635-3455 or (906)440-7592 (cell) while in the area. Ken is the local observer of both of the COE, Soo Locks PORTS gauges, U.S. Slip and S.W. Pier. Ensure that all gauges have been operating correctly. Indicate all findings, actions, contact, and other information on the station report.
3. To access the PBM inside Brady Park and on the Indian grounds contact Mr. Cecil Pavlat with the Tribal Council, office @ 906-632-7480 or 906-440-7849 cell.

9076070 S.W. Pier, MI (PORTS)
PBM: V 295 (RJ0608)
GPS Bench Mark: UNIT 10 106 (AE8008)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27889 **Part 2**
PBM Elevation (Dynamic): 186.0904 m
Hydraulic Corrector: 0.000 m
Last GPS Observation Performed: 08/05
Last Dive: 06/04

1. Level to the Met SRM as stated in Section 3.0 of the Guidelines for Meteorological Station Reconnaissance and Meteorological Sensor Height Measurements, Updated January 2011.
2. Determine inside intake inverse elevation, as long as interior subfloor structure is safe to work on.
3. Contact Ken Smith, with the COE Soo Area Office @ (906)635-3455 or (906)440-7592 (cell) while in the area. Ken is our local observer of both of the COE, Soo Locks PORTS gauges, U.S. Slip, and S.W. Pier. Ensure that all gauges have been operating correctly. Indicate all findings, actions, contact, and other information on the station report.
4. Measure the elevation of the water temperature sensor above the appropriate datum as stated in Section 3.0 of the Guidelines for Meteorological Station Reconnaissance and Meteorological Sensor Height Measurements, Updated January 2011.

2.15.11. Lake Superior

9099004 Point Iroquois, MI (PORTS)

PBM: A 293 (RJ0586)

GPS Bench Mark: A 293 (RJ0586)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27890

Part 1

PBM Elevation (Dynamic): 187.7989 m

Hydraulic Corrector: -0.100 m

Last GPS Observation Performed: 07/10

Last Dive: 09/07

1. Include Bench Marks 909 9004 IROQUOIS 1 and 909 9004 A 295 in survey. NOTE: IROQUOIS 1 requires special equipment to level.
2. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
3. Please provide a second directional photo of Bench Marks 909 9004 IROQUOIS 1.
4. Verify Bench Mark A 295 is destroyed. If possible, provide photographic evidence.

9099018 Marquette, MI (MASTER)

PBM: NO.11 (RK0113)

GPS Bench Mark: 909 9018 K (AH7272)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27890

Part 2

PBM Elevation (Dynamic): 188.9570 m

Hydraulic Corrector: 0.000 m

Last GPS Observation Performed: 07/10

Last Dive: 07/06

1. Level to the Met SRM as stated in Section 3.0 of the Guidelines for Meteorological Station Reconnaissance and Meteorological Sensor Height Measurements, Updated January 2011.
2. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.

9099044 Ontonagon, MI

PBM: 909 9044 VFW (AE8284)

GPS Bench Mark: 909 9044 L (DJ5175)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27890

Part 3

PBM Elevation (Dynamic): 186.0416 m

Hydraulic Corrector: +0.049 m

Last GPS Observation Performed: 07/10

Last Dive: 08/08

1. Provide a face, setting and two directional photos of Bench Marks 909 9044 2 and 909 9044 H. NOTE: 904 9044 2 is located on a lighthouse and requires special access with the lighthouse society. Confirm if Bench Mark 909 9044 H is destroyed. If possible, provide photographic evidence.

9099064 Duluth, MN

PBM: 909 9064 F (AE8288)

GPS Bench Mark: 602 (AE8289)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27890

Part 4

PBM Elevation (Dynamic): 184.7100 m

Hydraulic Corrector: +0.079 m

Last GPS Observation Performed: 07/10

Last Dive: 09/07

1. Recover Bench Mark BAR, survey to it if recoverable. Verify if destroyed. If possible, provide photographic evidence.
2. Please provide a second directional photo of Bench Marks 909 9064 BAR, if not destroyed.

9099090 Grand Marais, MN

PBM: 909 9090 SCOTT (SH0674)

GPS Bench Mark: MARAIS RESET (AA2869)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27890

Part 5

PBM Elevation (Dynamic): 184.9850 m

Hydraulic Corrector: +0.046 m

Last GPS Observation Performed: 07/10

Last Dive: 08/10

1. Inspect all CORS station components for proper operation and notify NGS of any problems found. Indicate all findings, actions, contact, and other information on the station report.
2. Provide a face, setting and two directional photos for Bench Marks 909 9090 COBBLE and R 355. Confirm if searched for not recovered, if destroyed verify with a photograph.
3. Include a photo showing the entire wind sensor tower from a distance.

2.16. FOD/POB – Hawaii, Pacific Islands, West Coast, and 16 Alaska Stations

2.16.1 FOD/POB – Hawaii and the Pacific Island Stations

1611400 Nawiliwili, HI	L27878	Part 1
<i>PBM:</i> 161 1400 TIDAL 14		<i>PBM above SD:</i> 3.155 m
<i>GPS Bench Mark:</i> 161 1400 WALL		<i>MSL above SD:</i> 0.949 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 01/08	
<i>Dive Inspection Frequency:</i> Every 2 years		<i>Last Dive:</i> 01/10

1. **Unresolved from 2011 Project Instructions:** Replace the 6 inch well clamps and the bands around the piling.
2. Determine elevation of Met SRM above water level and note the date/time of the observation in the site report.
3. Install a GPS antenna at the stand alone met station.
4. Replace the GPS antenna at the water level station.
5. Provide a description and photo of the Met SRM.

1612340 Honolulu, HI	L27878	Part 2
<i>PBM:</i> 161 2340 BM 8 (TU0286)		<i>PBM above SD:</i> 3.734 m
<i>GPS Bench Mark:</i> GSL 2340 1987		<i>MSL above SD:</i> 1.412 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 02/08	
<i>Dive Inspection Frequency:</i> Every 2 years		<i>Last Dive:</i> 01/11

1. Provide a description and photo of the Met SRM.
2. Replace all four ¾” brass bolts for the well flange.

1612480 Mokuoloe, HI	L27878	Part 3
<i>PBM:</i> 161 2480 NO 1		<i>PBM above SD:</i> 1.969 m
<i>GPS Bench Mark:</i> 161 2480 TIDAL 2 (AA3575)		<i>MSL above SD:</i> 1.210 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 02/08	
<i>Dive Inspection Frequency:</i> Every 2 years		<i>Last Dive:</i> 01/10

1. Measure the elevations of the wind and air temperature sensors above the bolt at base of the tower.
2. Measure the Met SRM height above water and document this elevation along with the date/time in the comments section of the site report.
3. Replace T1 sensor and cable on DCP1.
4. Install a new GPS antenna.
5. Install new setup files on DCP3 to include logging to storage card.

1615680 Kahului, HI**PBM:** 161 5680 A (DK4805)**GPS Bench Mark:** 161 5680 A (DK4805)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27878****Part 4****PBM above SD:** 3.007 m**MSL above SD:** 1.075 m**Last GPS Observation Performed:** 01/08**Last Dive:** 01/11

1. Drill holes in the Aquatrak top hat.
2. Install a mesh screen on the top hat.
3. Provide a description and photo of the Met SRM.

1617433 Kawaihae, HI**PBM:** 161 7433 B (DK3434)**GPS Bench Mark:** 161 7433 B (DK3434)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27878****Part 5****PBM above SD:** 3.094 m**MSL above SD:** 1.134 m**Last GPS Observation Performed:** 02/08**Last Dive:** 02/11

1. **Unresolved from 2011 Project Instructions:** Replace the 6 inch well clamps.
2. Replace the protective well copper insert.
3. Replace the conduit for the backup bubbler tubing.

1617760 Hilo, HI**PBM:** 161 7760 TIDAL 4 (TU0020)**GPS Bench Mark:** 161 7760 A**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L27878****Part 6****PBM above SD:** 4.663 m**MSL above SD:** 1.545 m**Last GPS Observation Performed:** 01/08**Last Dive:** 01/09

1. Measure the Met SRM height above water and document this elevation along with the date/time in the comments section of the site report.
2. Provide a description and photo of the Met SRM.

1619910 Sand Island, Midway Islands**L27879****Part 1****PBM:** 161 9910 TIDAL 21**PBM above SD:** 3.243 m**GPS Bench Mark:** 161 9910 A**MSL above SD:** 1.020 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 10/09**Dive Inspection Frequency:** Every year**Last Dive:** 10/11

1. Install an iridium modem.
2. Take setting and general location photos of all existing bench marks
3. Take a photo of the air temperature sensor.
4. Level to the Met SRM as stated in Section 3.0 of the Guidelines for Meteorological Station Reconnaissance and Meteorological Sensor Height Measurements, Updated January 2011.
5. Coordinate with the COASTAL Program Manager to determine whether any support is needed for a CORS recon.

1630000 Guam**L27879****Part 2****PBM:** 163 0000 TIDAL 4 (TW0043)**PBM above SD:** 2.364 m**GPS Bench Mark:** 163 0000 TIDAL 11 (AA4394)**MSL above SD:** 0.826 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 03/10**Dive Inspection Frequency:** Every year**Last Dive:** 10/10

1. Replace the DCP 3 wind bird.
2. Replace the Shakespeare mast and 5 feet pole if funding is available.
3. Level to the Met SRM as stated in Section 3.0 of the Guidelines for Meteorological Station Reconnaissance and Meteorological Sensor Height Measurements, Updated January 2011.
4. Establish and level three surface marks, designation/stamping as follows: 163 0000 S/000 S 2012; 163 0000 T/0000 T 2012; and 163 0000 U/0000 U 2012.
5. Update the bench mark sketch with the new mark.
6. Take face, setting, and location photos of any newly established marks.
7. Take setting and general location photos of all existing bench marks.
8. Take photos of the met tower/suite to include the top of the structure and the ground with all mounted sensors clearly visible.

1631428 Pago Bay, Guam**L27879****Part 3****PBM:** 163 1428 B (DH3105)**PBM above SD:** 10.000 m**GPS Bench Mark:** 163 1428 1214 (DH2988)**MSL above SD:** 7.740 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 04/10**Dive Inspection Frequency:** Every year**Last Dive:** 09/11

1. Replace the 40 amp-hr batteries for the Xpert Dark DCP and redundant pump.
2. Determine the elevation of the wind sensor above the Met SRM (base of building).
3. Measure the Met SRM height above water and document this elevation along with the date/time in the comments section of the site report.

1770000 Pago Pago**PBM:** 177 0000 S (DE8786)**GPS Bench Mark:** 177 0000 S (DE8786)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27879****Part 4****PBM above SD:** 2.557 m**MSL above SD:** 1.194 m**Last GPS Observation Performed:** 12/09**Last Dive:** 11/11

1. Install a taller mast for the Met sensors.
2. Move DCP3 GPS antenna down to outside the lab space.
3. Replace DCP1, DCP2, and DCP3 GPS antenna cables with new 50' cables.
4. Replace DCP3 water temperature sensor.
5. Replace both surge protectors with standard thermally resetting units.
6. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

1820000 Kwajalein**PBM:** 182 0000 TIDAL 8 (DK7537)**GPS Bench Mark:** 182 0000 TIDAL 12**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27879****Part 5****PBM above SD:** 2.853 m**MSL above SD:** 1.457 m**Last GPS Observation Performed:** 03/10**Last Dive:** 10/10

1. Replace the Aquatrak parallel plate assembly.
2. Add two bails to the Aquatrak sounding tube.
3. Add a double bracket configuration to the solar panel mounting scheme.
4. Replace the T2 sensor.
5. Through bolt the dual wind sensor mount to prevent torque.
6. Determine the elevation of the wind sensor above the Met SRM (base of building).
7. Measure the Met SRM height above water and document this elevation along with the date/time in the comments section of the site report.
8. Take face and setting photos of 1820000 P.
9. Take photos of the met tower/suite to include the top of the structure and the ground with all mounted sensors clearly visible.

1890000 Wake Island**L27879****Part 6*****PBM:*** 189 0000 TIDAL 12 (TW0169)***PBM above SD:*** 4.353 m***GPS Bench Mark:*** 161 0000 L***MSL above SD:*** 1.608 m***GPS Observation Frequency:*** Every 5 years***Last GPS Observation Performed:*** 11/06***Dive Inspection Frequency:*** Every year***Last Dive:*** 11/10

1. Replace protective well copper insert in Aquatrak well.
2. Install a forklift barrier or bollards around the rohn tower.
3. Replace the batteries for the pump power boxes.
4. Replace and re-terminate all pump and solar connectors with “quick-connect” type, similar to those used on the DCP batteries.
5. Determine the elevation of the wind sensor above the Met SRM (base of tower at primary DCP/station).
6. Measure the Met SRM height above water and document this elevation along with the date/time in the comments section of the site report.
7. Establish and level one surface mark, designation/stamping as follows: 1890000 V/0000 V 2012.
8. Update the bench mark sketch with the new mark.
9. Take face, setting, and location photos for the newly established mark.
10. Coordinate with the COASTAL Program Manager to determine whether any support is needed for a CORS recon.

2.16.2 FOD/POB – California Stations

9410170 San Diego, CA

L27873

Part 1

PBM: 941 0170 TIDAL 12 (DC0891)

PBM above SD: 6.325 m

GPS Bench Mark: 941 0170 W

MSL above SD: 2.052 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 03/11

Dive Inspection Frequency: Every 2 years

Last Dive: 03/11

1. Inspect bottom well bracket.
2. Drop Bench Marks M 57 and TIDAL 9 from the bench mark network, install two new marks to replace them with the designations/stampings 941 0170 Y/0170 Y 2012 and 941 0170 Z/0170 Z 2012.
3. Remove and replace tide station to end of pier if agreement is in place with USS Midway.

9410172 USS MIDWAY South Navy Pier, San Diego, CA

Met Only Station

1. Upgrade to new OS when bug is fixed. Current upgrade to OS 3.4.0.27 does not work.
2. Confirm Xpert Display S/N.
3. Measure/verify the elevations of the wind and air temperature sensors above the Met SRM (suggest using the deck).
4. Measure the Met SRM height above water and document this elevation along with the date/time in the comments section of the site report.

9410230 La Jolla, CA

L27873

Part 2

PBM: 941 0230 TIDAL 7 (DC0986)

PBM above SD: 12.299 m

GPS Bench Mark: 941 0230 M TIDAL (DC1313)

MSL above SD: 2.163 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 03/11

Dive Inspection Frequency: Every year

Last Dive: 03/11

1. No additional requirements.

9410647 Angels Gate, CA (PORTS)

Met Only Station

1. Measure the elevations of the wind and air temperature sensors above the Met SRM.
2. Provide a description and photo of the Met SRM and measure to the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
3. Determine elevation of the barometer above the water level to obtain a height above MSL.
4. Take station photos showing the met sensors.

9410660 Los Angeles (PORTS), CA**L27873****Part 3****PBM:** 941 0660 TIDAL 8 (DY1083)**PBM above SD:** 5.361 m**GPS Bench Mark:** 941 0660 TIDAL 8 (DY1083)**MSL above SD:** 2.028 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 03/11**Dive Inspection Frequency:** Every year**Last Dive:** 03/11

1. Monitor condition of underwater Uni-Strut brackets holding bubbler tubing conduit.
2. Install a new DC powered phone switch since the AC power is randomly turned off to station by the port.

9410689 Gerald Desmond Bridge, CA (PORTS)**Air Gap Only Station**

1. No additional requirements.

9410840 Santa Monica, CA**L27873****Part 4****PBM:** 941 0840 TIDAL 12 (EW6840)**PBM above SD:** 15.060 m**GPS Bench Mark:** 941 0840 N TIDAL (AH7469)**MSL above SD:** 1.594 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 03/11**Dive Inspection Frequency:** Every year**Last Dive:** 03/11

1. Add NOS signage to the windows of the tide house doors inside glass.
2. Evaluate all piling clamps for future replacement.
3. Plan one day of diving for marine growth removal prior to installation.
4. Take a setting photo of Bench Mark 941 0840 TIDAL 12.
5. Replace T2 sensor.
6. Add another bail to the cal tube.
7. Verify that there is no movement of SRM 941 0840 SQUAREF from 2011 to 2012, last year a movement of 0.0291 m was noticed.
8. Replace the failed water temperature sensor.

9411340 Santa Barbara, CA**L27873****Part 16****PBM:** 941 1340 S**PBM above SD:** 4.141 m**GPS Bench Mark:** 941 1340 SB2 RESET**MSL above SD:** 1.824 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 03/11**Dive Inspection Frequency:** Every year**Last Dive:** 03/11

1. Provide a description and photo of the Met SRM.

9411406 TOPEX, CA
PBM: 941 1406 NO STAMPING (+20 LEG 1992)
GPS Bench Mark: N/A
GPS Observation Frequency: Not required.
Dive Inspection Frequency: Every year

L27873 **Part 19**
PBM above SD: 20.150 m
MSL above SD: 14.467 m
Last GPS Observation Performed: N/A
Last Dive: 09/11

NOTE: Use of optical levels at this station is authorized. There is a permanent GPS unit on site that is maintained by JPL and connected by FOB leveling to the water level sensor.

1. Check the GOES antenna for corrosion; ship one additional replacement flat plane next visit.
2. Bring wireless testing kit and two IP Modems to install next visit if a wireless signal can be found.

9412110 Port San Luis, CA
PBM: 941 2110 TIDAL 6 (FV0898)
GPS Bench Mark: 941 2110 TIDAL 6 (FV0898)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27873 **Part 5**
PBM above SD: 5.691 m
MSL above SD: 2.149 m
Last GPS Observation Performed: 02/11
Last Dive: 03/11

1. Replace hardware on wind mast stays with SS 316 hardware.

9413450 Monterey, CA
PBM: 941 3450 TIDAL 2 (GU2090)
GPS Bench Mark: 941 3450 M TIDAL (GU4116)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27873 **Part 6**
PBM above SD: 5.669 m
MSL above SD: 1.893 m
Last GPS Observation Performed: 02/11
Last Dive: 12/11

1. Replace the A/C charger for the pump power supply.

9414290 San Francisco, CA (PORTS)
PBM: 941 4290 TIDAL 180 (HT0702)
GPS Bench Mark: 941 4290 TIDAL 180 (HT0702)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27873 **Part 7**
PBM above SD: 5.794 m
MSL above SD: 2.773 m
Last GPS Observation Performed: 08/10
Last Dive: 10/11

1. No additional requirements.

9414311 Pier 1 San Francisco, CA (PORTS)

Met Only Station

1. Determine the elevation of the barometer above the water level to obtain a height above MSL. Note elevation in the comments section.
2. Provide a description and photo of the Met SRM and measure to the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.

9414523 Redwood City, CA (PORTS)

L27873

Part 8

PBM: 941 4523 TIDAL 13 (HT2319)

PBM above SD: 5.993 m

GPS Bench Mark: 941 4508 C

MSL above SD: 3.378 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 10/09

Dive Inspection Frequency: Every year

Last Dive: 10/11

1. No additional requirements.

9414750 Alameda, CA (PORTS)

L27873

Part 9

PBM: 941 4750 TIDAL 8 (HT0890)

PBM above SD: 4.795 m

GPS Bench Mark: 941 4750 TIDAL 7 (HT0882)

MSL above SD: 2.067 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 08/10

Dive Inspection Frequency: Every year

Last Dive: 10/11

1. Check the backup orifice fitting.

9414769 Oakland Middle Harbor, CA (PORTS)

Met Only Station

1. Measure the elevation of the wind sensor above the Met SRM.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
3. Take station photos showing the met sensors.

9414776 Oakland Berth 34, CA (PORTS)

Met Only Station

1. Determine elevation of the barometer above the water level to obtain a height above MSL. Note elevation in the comments section.
2. Provide a description and photo of the Met SRM and measure to the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.

9414847 Point Potrero Richmond, CA (PORTS)**Met Only Station**

1. Measure the elevations of the wind and air temperature sensors above the Met SRM.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
3. Determine the elevation of the barometer above the water level to obtain a height above MSL. Note elevation in the comments section.
4. Take station photos showing the met sensors.

9414863 Richmond, CA (PORTS)**L27873****Part 10****PBM:** TIDAL 3 STA III 23 (HT0940)**PBM above SD:** 6.376 m**GPS Bench Mark:** 941 4863 M**MSL above SD:** 4.520 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 10/09**Dive Inspection Frequency:** Every year**Last Dive:** 10/11

1. **Unresolved from 2011 Project Instructions:** Take one directional photo of 941 4863 E.
2. Check the parallel plates to ensure they are secure on the end of the double cone orifice.
3. Check the orifice fitting for wear.
4. Add additional SS band-it to the backup conduit along the pile at a location mid-span between the current conduit clamps.
5. Add “No Moorage” sign to the well using 6” clam shell bands.
6. Purchase and place a cargo net across the equipment room to prevent storage items from falling on the equipment.
7. Install a new bench mark with designation/stamping 941 4863 P/4863 P 2012 to replace the destroyed Bench Mark TIDAL 1 STA III 23.

9414958 Bolinas Lagoon, CA (COASTAL)**L27873****Part 17****PBM:** 941 4958 F**PBM above SD:** 4.823 m**GPS Bench Mark:** 941 4958 F**MSL above SD:** 1.437 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/09**Dive Inspection Frequency:** Every year**Last Dive:** 08/11

1. Coordinate the annual inspection with the COASTAL project manager - Artara Johnson, and the COASTAL Program Manager. Notify Bill Carmen, Marin County Open Space District, prior to any site visit.
2. Re-route the bubbler tubing into the new pipe chase through the concrete cap extension on wall.
3. Install an additional bench mark, designation/stamping 941 4958 K/4958 K 2012 to bring network to a total of five bench marks.

9415020 Point Reyes, CA

L27873

Part 11

PBM: B 243 (HT1839)

PBM above SD: 4.977 m

GPS Bench Mark: 941 5020 Q TIDAL (HT3505)

MSL above SD: 2.152 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 10/10

Dive Inspection Frequency: Every year

Last Dive: 12/11

1. **Unresolved from 2011 Project Instructions:** Remove the derelict ADR and ETG wells.
2. Repair/replace the kickblock for Bench Mark 941 5020 J.

9415102 Martinez Amorco Pier, CA (PORTS)

Met Only Station

1. Install a new water level station; POB will coordinate details with the task manager and PORTS manager in CO-OPS.
2. Measure the elevation of the wind sensor above Met SRM.
3. Provide a description and photo of the Met SRM and measure to the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
4. Take station photos showing the met sensors.
5. Determine elevation of the barometer above the water level to obtain a height above MSL. Note elevation in the comments section.

9415115 Pittsburg, CA (PORTS)

Met Only Station

1. Determine the elevation of the barometer above the water level to obtain a height above MSL. Note elevation in the comments section.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.

9415118 Union Pacific Rail Road Bridge (UPRR), CA (PORTS)

Met Only Station

1. **Unresolved from 2011 Project Instructions:** Take station photos showing the met sensors.

9415141 Davis Point, CA (PORTS)

Met Only Station

1. Determine elevation of the barometer above the water level to obtain a height above MSL. Note elevation in the comments section.
2. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.

9415144 Port Chicago, CA (PORTS)**L27873****Part 12****PBM:** 941 5144 H (AH7472)**PBM above SD:** 4.209 m**GPS Bench Mark:** 941 5144 H TIDAL (AH7472)**MSL above SD:** 1.996 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 08/10**Dive Inspection Frequency:** Every year**Last Dive:** 10/11

1. Remove silt below well.
2. Reconstruct Bench Marks 941 5144 H, 941 5144 J, and 941 5144 K from 4 inch PVC to 6 inch PVC kick block with cast access cover.
3. If personnel and time permits, remove and replace orifice as needed.

9415218 Mare Island, CA**L27873****Part 18****PBM:** 941 5218 L**PBM above SD:** 4.2670 m**GPS Bench Mark:** 941 5218 L**MSL above SD:** 1.864 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 08/10**Dive Inspection Frequency:** Every year**Last Dive:** 10/09

1. Perform a steel tape measurement from the orifice zero to the rod stop.

9416841 Arena Cove, CA**L27873****Part 13****PBM:** 941 6841 TIDAL 6 (JT9392)**PBM above SD:** 11.604 m**GPS Bench Mark:** 941 6841 J TIDAL (JT9387)**MSL above SD:** 9.786 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 12/11**Dive Inspection Frequency:** Every year**Last Dive:** 12/11

1. No additional requirements.

9418767 North Spit, CA**L27873****Part 14****PBM:** 941 8767 TIDAL 9 (LV0361)**PBM above SD:** 9.205 m**GPS Bench Mark:** 941 8767 B TIDAL (LV0632)**MSL above SD:** 5.562 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 05/11**Dive Inspection Frequency:** Every year**Last Dive:** 12/11

1. **Unresolved from 2011 Project Instructions:** Replace the protective well copper insert, if necessary.
2. Measure the elevations of the wind and air temperature sensors above the Met SRM (base of tower).
3. Provide a description and photo of the Met SRM and measure to the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.
4. Determine elevation of the barometer above the water level to obtain a height above MSL. Note elevation in the comments section.
5. Change kick blocks for (3) of the deep rod marks to accommodate the invar rods.

9419750 Crescent City, CA

L27873

Part 15

PBM: 941 9750 TIDAL 20 RESET (LV0110)

PBM above SD: 5.227 m

GPS Bench Mark: 941 9750 TIDAL 20 RESET (LV0110)

MSL above SD: 2.254 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 04/11

Dive Inspection Frequency: Every 2 years

Last Dive: 07/09

1. Establish a level connection between the station bench mark network and the newly established CORS station (within 1km).
2. Replace the kick block for Bench Mark 941 9750 S TIDAL with 6" PVC and logo cap lid before leveling.
3. Install a new logo cap lid for Bench Mark 941 9750 V TIDAL.
4. Replace missing parallel plates on Aquatrak well

2.16.3 FOD/POB – Oregon Stations

9431647 Port Orford, OR

L27874

Part 1

PBM: 941 1647 TIDAL 6 (OA0075)

PBM above SD: 12.256 m

GPS Bench Mark: 943 1647 TIDAL LEAD (OA0790)

MSL above SD: 8.224 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 04/11

Dive Inspection Frequency: Every year

Last Dive: 07/09

1. Install new style thermal reset surge power strip
2. Please update the latitude and longitude for 943 1647 U in the Word document Bench Mark Descriptions with the latest value from the WinDesc file.

9432780 Charleston, OR

L27874

Part 2

PBM: 943 2780 A TIDAL (OA0650)

PBM above SD: 5.895 m

GPS Bench Mark: 943 2780 A TIDAL (OA0650)

MSL above SD: 2.390 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 04/11

Dive Inspection Frequency: Every year

Last Dive: 07/10

1. Relocate temporary tide station to the new USCG boat house.
2. Move Air Temp to MET station during new move.
3. Re-level the barometer elevation at new location.
4. Install back up gauge and back up orifice.
5. Install (2) new surface bench marks. (1) at new OSU site and another North of station at Harbor Master's flag pole monument (permission will be needed first) with designations/stampings 943 2780 E/2780 E 2012 and 943 2780 F/2780 F 2012.
6. Get steel tape measurement for wind during air relocation.
7. Take setting photo of Bench Mark 941 2780 TIDAL 10 and submit to OET.
8. Mount GOES and GPS antenna to new pipe (see recon photos from 2011 AI folder).
9. Remove old stand alone system (see photos from 2010 folder).
10. Provide a description and photo of the Met SRM.
11. Provide photos of the air temperature sensor/location.

9435380 South Beach, OR

L27874

Part 3

PBM: C 590 (QE1114)

PBM above SD: 6.194 m

GPS Bench Mark: 943 5380 D TIDAL (QE1615)

MSL above SD: 2.806 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 07/11

Dive Inspection Frequency: Every year

Last Dive: 07/09

1. **Unresolved from 2011 Project Instructions:** Evaluate the second clamp below the pier deck and the bottom clamp for future replacement.
2. If the CORS has been established by the date of the annual inspection, establish a level connection to the CORS.

9437540 Garibaldi, OR**PBM:** 943 7540 A**GPS Bench Mark:** 943 7540 H**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27874****Part 5****PBM above SD:** 5.827 m**MSL above SD:** 2.577 m**Last GPS Observation Performed:** 07/11**Last Dive:** 07/09

1. **Unresolved from 2011 Project Instructions:** Install a temporary tide gauge system at old Coast Guard base if the walkway and boat house will may be replaced in CY 2011.
2. Take setting photos of Bench Marks 943 7540 TIDAL B and 943 7540 D.
3. Replace protective well copper insert.
4. Remove old GPS antenna from MET station (exterior wall) if consistent GPS sync during year.
5. Remove old radio antenna from USCG boathouse.
6. Determine the elevation of Met SRM for winds above water level and note the date/time of the observation in the site report.

9439011 Hammond, OR (PORTS)**PBM:** 943 9011 A TIDAL (AC5405)**GPS Bench Mark:** 943 9011 A TIDAL (AC5405)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every year**L27874****Part 8****PBM above SD:** 6.190 m**MSL above SD:** 2.135 m**Last GPS Observation Performed:** 08/11**Last Dive:** 06/11

1. Establish a phone line.
2. Evaluate density issue and prepare plan to modify equipment.
3. Install MWWL sensor as primary sensor and remove the installed primary pressure sensor.

9439040 Astoria, OR (PORTS)**PBM:** 943 9040 TIDAL 11 (SC1053)**GPS Bench Mark:** 943 9040 TIDAL 12 (SC1055)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L27874****Part 4****PBM above SD:** 5.934 m**MSL above SD:** 2.054 m**Last GPS Observation Performed:** 07/11**Last Dive:** 06/11

1. Run an additional GPS survey due to the hole on Bench Mark 943 9040 TIDAL 12 being offset from center of mark.
2. Maintain all the meteorological sensors installed as the funding is received from NOS CSC Coastal Storms Program in FY 12.

9439099 Wauna, OR (PORTS)

PBM: 943 9909 H

GPS Bench Mark: 943 9099 A TIDAL (SC1086)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27874

Part 6

PBM above CRD: 4.481 m

MSL above SD: 1.332 m

Last GPS Observation Performed: 08/09

Last Dive: 08/11

1. No additional requirements

9439201 St. Helens, OR (PORTS)

PBM: 943 9201 A

GPS Bench Mark: 943 9201 OSMB 0502

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27874

Part 7

PBM above CRD: 20.534 m

MSL above SD: 1.047 m

Last GPS Observation Performed: 08/09

Last Dive: 08/11

1. No additional requirements

2.16.4 FOD/POB – Washington Stations

9440083 Vancouver, WA (PORTS)

PBM: 944 0083 D

GPS Bench Mark: 944 0083 F

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27875

Part 11

PBM above CRD: 9.470 m

MSL above SD: 0.940 m

Last GPS Observation Performed: 08/09

Last Dive: 08/11

1. No additional requirements.

9440422 Longview, WA (PORTS)

PBM: 944 0422 E

GPS Bench Mark: 944 0422 TIDAL 5 (SC1112)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27875

Part 12

PBM above CRD: 8.949 m

MSL above SD: 1.385 m

Last GPS Observation Performed: 08/09

Last Dive: 08/11

1. Conduct a meeting with the Port of Longview Engineers prior to 2012 summer season to plan out relocation of the tide house for next year. Contact Mr. Norm Krehbiel- Director of Engineering- Port of Longview-360.425.3305
2. Maintain all the meteorological sensors installed as the funding is received from NOS CSC Coastal Storms Program in FY 12.

9440569 Skamokawa, WA (PORTS)

PBM: N 317 (SC0338)

GPS Bench Mark: 944 0569 C

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27875

Part 13

PBM above CRD: 7.232 m

MSL above SD: 1.269 m

Last GPS Observation Performed: 09/10

Last Dive: 08/11

1. **Unresolved from 2009 Project Instructions:** Raise the tide house 3 feet with plastic timbers, placing the tide house above the waterline; contingent upon Port of Portland funding. Provide FERS with an engineering plan.
2. Take one directional photo of Bench Marks 944 0569 N 317 and 944 0569 A.

9440910 Toke Point, WA**L27875****Part 1****PBM:** 944 0910 P**PBM above SD:** 5.408 m**GPS Bench Mark:** FLAG (SC0916)**MSL above SD:** 2.836 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 03/11**Dive Inspection Frequency:** Every year**Last Dive:** 03/11

1. Add 5 inch PVC and lid with concrete kickblock for Bench Mark 944 0910 K.
2. Install one additional bench mark with the designation/stamping 944 0910 S/0910 S 2012.
3. Investigate dropping Bench Mark 944 0910 R as this mark shows signs of movement.
4. Verify the Barometer serial #.

9441102 Westport, WA**L27875****Part 2****PBM:** 944 1102 K**PBM above SD:** 5.604 m**GPS Bench Mark:** 944 1102 K**MSL above SD:** 2.386 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/11**Dive Inspection Frequency:** Every year**Last Dive:** 06/11

1. Provide photos of relocated met (winds, AT).
2. Measure the elevation of the air temperature above the Met SRM.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9442396 La Push, WA**L27875****Part 3****PBM:** 944 2396 TIDAL 7 (SD0158)**PBM above SD:** 10.400 m**GPS Bench Mark:** 944 2396 G**MSL above SD:** 2.979 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/11**Dive Inspection Frequency:** Every year**Last Dive:** 06/11

1. Replace Pump for redundant DCP (motor to pump coupling is failing).
2. Ground Paros enclosures with 12 gauge solid ground wire.

9443090 Neah Bay, WA**L27875****Part 4****PBM:** 944 3090 TIDAL 19 (TS0161)**PBM above SD:** 6.507 m**GPS Bench Mark:** 944 3090 TIDAL 19 (TS0161)**MSL above SD:** 1.925 m**GPS Observation Frequency:** Every 5**Last GPS Observation Performed:** 06/11**Dive Inspection Frequency:** Every year**Last Dive:** 08/10

1. **Unresolved from 2011 Project Instructions:** Replace the four brass bolts on the orifice assembly.
2. **Unresolved from 2011 Project Instructions:** Take setting photo of Bench Mark 944 3090 D.
3. Take zoomed-out photo of air temperature sensor.

9444090 Port Angeles, WA**PBM:** L 467 (TR0790)**GPS Bench Mark:** L 467 (TR0790)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L27875****Part 5****PBM above SD:** 14.475 m**MSL above SD:** 10.534 m**Last GPS Observation Performed:** 08/11**Last Dive:** 11/09

1. **Unresolved from 2011 Project Instructions:** Take setting and general location photos of Bench Marks L 467, TIDAL 11, TIDAL 13, TIDAL 14, 944 4090 A, and 944 4090 B.

9444900 Port Townsend, WA**PBM:** 944 4900 BM 18**GPS Bench Mark:** 944 4900 D TIDAL (AI2202)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L27875****Part 6****PBM above SD:** 6.559 m**MSL above SD:** 2.547 m**Last GPS Observation Performed:** 08/11**Last Dive:** 06/10

1. **Unresolved from 2011 Project Instructions:** Arrange with the phone company to replace the phone line running from the demark point to the station phone line interface.

9446482 Tacoma Met, WA (PORTS)**Met Only Station**

1. Measure the elevation of the wind sensor above Met SRM
2. Provide a description and photo of the Met SRM and measure to the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.

9446484 Tacoma, WA (PORTS)**PBM:** 944 6484 A**GPS Bench Mark:** 944 6484 B**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every**L27875****Part 7****PBM above SD:** 5.326 m**MSL above SD:** 2.269 m**Last GPS Observation Performed:** 04/10**Last Dive:** 04/10

1. No additional requirements

9447130 Seattle, WA**PBM:** 944 7130 TIDAL 23**GPS Bench Mark:** DAVE**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L27875****Part 8****PBM above SD:** 8.851 m**MSL above SD:** 4.443 m**Last GPS Observation Performed:** 03/07**Last Dive:** 09/10

1. No additional requirements

9449419 Cherry Point at South Dock, WA (PORTS)**Met Only Station**

1. Take photos of the Met sensors in daytime.
2. Measure the elevations of the wind and air temperature sensors above Met SRM (barring facility restrictions).
3. Provide a description and photo of the Met SRM and measure the elevation of the Met SRM above the water level. Document this elevation along with the date and time of the measurement in the comments section of the site report.

9449424 Cherry Point, WA (PORTS)**L27875****Part 9*****PBM:*** 944 9424 TIDAL 1***PBM above SD:*** 11.226 m***GPS Bench Mark:*** 941 9424 J TIDAL (AI2204)***MSL above SD:*** 3.543 m***GPS Observation Frequency:*** Every 5 years***Last GPS Observation Performed:*** 04/11***Dive Inspection Frequency:*** Every year***Last Dive:*** 06/10

1. Measure the elevations of the winds and air temperature sensors above the Met SRM.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
3. Update bench mark text description distances for the following bench marks: 944 9424 BM 5 ARCO, 944 9424 BM 6 ARCO, and 944 9424 L.
4. Take photos of the MET station including pictures of the Air Temp Shield.
5. Replace the spare water temperature sensor if feasible.

9449880 Friday Harbor, WA**L27875****Part 10*****PBM:*** 944 9880 TIDAL 10***PBM above SD:*** 4.892 m***GPS Bench Mark:*** 944 9880 C TIDAL (AI2205)***MSL above SD:*** 2.561 m***GPS Observation Frequency:*** Every 5 years***Last GPS Observation Performed:*** 08/11***Dive Inspection Frequency:*** Every year***Last Dive:*** 08/11

1. Replace brass bolts (4) on orifice assembly.
2. Take zoomed out photo of Met sensors and tower.

2.16.5 FOD/POB – Alaska Stations

9450460 Ketchikan, AK L27877 Part 1

PBM: 945 0460 TIDAL 24

GPS Bench Mark: 945 0460 TIDAL 37

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

PBM above SD: 8.946 m

MSL above SD: 4.345 m

Last GPS Observation Performed: 07/11

Last Dive: 04/09

1. No additional requirements.

9451054 Port Alexander, AK

L27877

Part 2

PBM: 945 1054 TIDAL 1

PBM above SD: 6.148 m

GPS Bench Mark: 945 1054 TIDAL 2

MSL above SD: 2.871 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 08/07

Dive Inspection Frequency: Every year

Last Dive: 06/11

1. Replace the upper foot on Xpert Dark DCP, including brass sleeve insert.
2. Correct the setup file for Xpert Dark DCP ensuring all backup water level data are being averaged appropriately.

9451600 Sitka, AK

L27877

Part 3

PBM: 945 1600 L

PBM above SD: 13.669 m

GPS Bench Mark: 945 1600 N

MSL above SD: 2.989 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 05/11

Dive Inspection Frequency: Every 2 years

Last Dive: 05/11

1. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9452210 Juneau, AK**L27877****Part 4****PBM:** 945 2210 C**PBM above SD:** 10.161 m**GPS Bench Mark:** 945 2210 JNU TIDAL GPS (AI4908)**MSL above SD:** 3.712 m**GPS Observation Frequency:** Every year**Last GPS Observation Performed:** 07/11**Dive Inspection Frequency:** Every year**Last Dive:** 07/11

1. **Unresolved from 2011 Project Instructions:** Take a setting photo of Bench Mark 945 2210 TIDAL 8.
2. Install new stainless steel bandits on orifice conduit; 4 on the primary orifice, 2 on the back up orifice.
3. Replace the water temperature sensor.
4. Replace redundant pump battery.
5. Establish and level one surface mark, designation/stamping as follows: 945 2210 L/2210 L 2012.
6. Update the bench mark sketch with new bench mark.
7. Take digital photos of the face, setting (waist or chest high view) and general location of the newly established bench mark.

9452400 Skagway, AK**L27877****Part 5****PBM:** 945 2400 TIDAL 11**PBM above SD:** 11.646 m**GPS Bench Mark:** 945 2400 C (AI4931)**MSL above SD:** 3.494 m**GPS Observation Frequency:** Every year**Last GPS Observation Performed:** 07/11**Dive Inspection Frequency:** Every year**Last Dive:** 07/11

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Measure the elevation of the air temperature above the Met SRM.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
4. Install two new stainless steel bandits to both the primary and backup orifice conduits.
5. Establish and level one surface mark, designation/stamping as follows: 945 2400 L/2400 L 2012.
6. Update the bench mark sketch with new bench mark.
7. Take digital photos of the face, setting (waist or chest high view) and general location of the newly established bench mark.

9452634 Elfin Cove, AK **L27877** **Part 6**
PBM: 945 2634 TIDAL 4 *PBM above SD: 9.365 m*
GPS Bench Mark: 945 2634 F *MSL above SD: 4.637 m*
GPS Observation Frequency: Every year *Last GPS Observation Performed: 07/11*
Dive Inspection Frequency: Every year *Last Dive: 07/11*

1. Install a new lower (DCP 1) orifice.
2. Install new air temperature sensor on the primary solar panel pole.
3. Install doors to protect gauges.
4. Install a witness post near Bench Mark 945 2634 G.

9453220 Yakutat, AK **L27877** **Part 7**
PBM: 945 3220 Z *PBM above SD: 8.745 m*
GPS Bench Mark: 945 3220 AA *MSL above SD: 2.159 m*
GPS Observation Frequency: Every year *Last GPS Observation Performed: 05/11*
Dive Inspection Frequency: Every year *Last Dive: 05/11*

1. No additional requirements.

9454050 Cordova, AK **L27877** **Part 8**
PBM: 945 4050 Q *PBM above SD: 16.456 m*
GPS Bench Mark: 945 4050 TIDAL 13 *MSL above SD: 3.972 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 05/11*
Dive Inspection Frequency: Every year *Last Dive: 05/11*

1. Replace the analog and digital I/O modules in DCP2.
2. Include the Met SRM in leveling run.

9454240 Valdez, AK **L27877** **Part 9**
PBM: 945 4240 TIDAL 21 *PBM above SD: 8.327 m*
GPS Bench Mark: 945 4240 T *MSL above SD: 4.035 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 07/11*
Dive Inspection Frequency: Every 2 years *Last Dive: 07/11*

1. Replace T1, T2 & WT sensor cables from sensor to DCP.
2. Replace the analog and digital I/O modules on DCPs 1 and 2.
3. Re-measure the elevations of the wind and air temperature sensors above the Met SRM.
 The Met Team suggests using a bolt at the base of the met tower.

9455090 Seward, AK
PBM: 945 5090 N
GPS Bench Mark: 945 5090 L
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27877 **Part 10**
PBM above SD: 7.717 m
MSL above SD: 3.566 m
Last GPS Observation Performed: 06/11
Last Dive: 06/11

1. Replace the GOES antenna.

9455500 Seldovia, AK
PBM: 945 5500 TIDAL 19
GPS Bench Mark: 945 5500 TIDAL 19
GPS Observation Frequency: Every year
Dive Inspection Frequency: Every year

L27877 **Part 11**
PBM above SD: 11.272 m
MSL above SD: 5.080 m
Last GPS Observation Performed: 06/11
Last Dive: 04/09

1. Establish and level one new bench mark, designation/stamping as follows: 945 5500 F/5500F 2012.
2. Update the bench mark sketch with newly established bench mark.
3. Take face, setting, and two directional photos of the newly established bench mark.

9455760 Nikiski, AK (PORTS)
PBM: 945 5760 L
GPS Bench Mark: 945 5760 L
GPS Observation Frequency: Every year
Dive Inspection Frequency: No dive requirement

L27877 **Part 12**
PBM above SD: 14.850 m
MSL above SD: 5.541 m
Last GPS Observation Performed: 06/11

1. Replace the GOES antenna and cable.
2. Replace the GPS antenna and cable.
3. Re-measure the elevations of the wind and air temperature sensors above the Met SRM.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9455920 Anchorage, AK (PORTS)
PBM: 945 5920 TIDAL 15 1966 (TT0711)
GPS Bench Mark: 945 5920 THERMO 1
GPS Observation Frequency: Every year
Dive Inspection Frequency: No dive requirement

L27877 **Part 13**
PBM above SD: 13.231 m
MSL above SD: 6.931 m
Last GPS Observation Performed: 06/11

1. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9457292 Kodiak, AK
PBM: 945 7292 B
GPS Bench Mark: KODIAK MON 7278 (TT4632)
GPS Observation Frequency: Every year
Dive Inspection Frequency: Every 2 years

L27877 **Part 14**
PBM above SD: 14.124 m
MSL above SD: 9.160 m
Last GPS Observation Performed: 07/11
Last Dive: 07/11

1. Re-secure the bubbler orifice tubing.

9457804 Alitak, AK
PBM: 945 7804 TIDAL 6
GPS Bench Mark: 945 7804 B
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27877 **Part 15**
PBM above SD: 7.521 m
MSL above SD: 3.574 m
Last GPS Observation Performed: 07/11
Last Dive: 07/11

1. Replace the GOES antenna and cable.

9497645 Prudhoe Bay, AK
PBM: 949 7645 CELL 4B
GPS Bench Mark: 949 7645 WINDSOCK
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Diving Not Allowed

L27877 **Part 26**
PBM above SD: 16.389 m
MSL above SD: 11.018 m
Last GPS Observation Performed: 07/11

NOTE: Use of optical levels at this station is authorized.

1. **Unresolved from 2011 Project Instructions:** Level to the Met SRM as stated in Section 3.0 of the Guidelines for Meteorological Station Reconnaissance and Meteorological Sensor Height Measurements, Updated January 2011.
2. **Unresolved from 2011 Project Instructions:** Take setting photos and one general location of all existing bench marks.
2. Measure the elevations of the wind and air temperature sensors above the Met SRM (base of building, at location of DCP).

2.17. JOA - Task 09-04: Ten Alaska Stations

Andrew Moss, Task Manager/Technical Representative (TR)

9459450 Sand Point, AK

L27877

Part 16

PBM: 945 9450 R

PBM above SD: 13.894 m

GPS Bench Mark: 945 9450 TIDAL 1293-1

MSL above SD: 10.482 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 05/11

Dive Inspection Frequency: Every 2 years

Last Dive: 06/10

1. Leave a protective well copper insert (GFE) in the tide house for the bottom of the Aquatrak well.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9459881 King Cove, AK

L27877

Part 17

PBM: 945 9881 D

PBM above SD: 6.888 m

GPS Bench Mark: KCH-1 1998

MSL above SD: 2.354 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 05/11

Dive Inspection Frequency: Every year

Last Dive: 05/11

1. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9461380 Adak, AK

L27877

Part 18

PBM: 946 1380 TIDAL 18 (UW7919)

PBM above SD: 6.700 m

GPS Bench Mark: 946 1380 TIDAL 18 (UW7919)

MSL above SD: 1.553 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 07/11

Dive Inspection Frequency: Every year

Last Dive: 07/11

1. Funding has been received from NOAA OCO to establish redundant DCPs (DCP3 & DCP4) at this station. The equipment was purchased in 2009, please perform the installation this year.
2. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9461710 Atka, Nazan Bay, AK	L27877	Part 19
<i>PBM: 946 1710 B</i>		<i>PBM above SD: 15.000 m</i>
<i>GPS Bench Mark: 946 1710 G</i>		<i>MSL above SD: 8.804 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 08/11</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 08/11</i>

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Install a new Paros box, with Paros sensor (GFE), for the backup gauge.
3. Install a new padlock.
4. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9462450 Nikolski, Mueller Cove, AK	L27877	Part 20
<i>PBM: 945 2450 F</i>		<i>PBM above SD: 7.782 m</i>
<i>GPS Bench Mark: 945 2450 ASTRO</i>		<i>MSL above SD: 1.936 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 08/11</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 08/11</i>

1. Install a 3 feet long section of tubing and replace the swagelok lock fittings on the backup orifice.
2. Replace the GOES antenna (GFE) and cable.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9462620 Unalaska, AK	L27877	Part 21
<i>PBM: 946 2620 TIDAL 7</i>		<i>PBM above SD: 3.597 m</i>
<i>GPS Bench Mark: 946 2620 TIDAL 19</i>		<i>MSL above SD: 1.427 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 08/11</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 08/11</i>

1. Provide a description and photo of the Met SRM.

9463502 Port Moller, AK	L27877	Part 22
<i>PBM: 946 3502 B</i>		<i>PBM above SD: 15.422 m</i>
<i>GPS Bench Mark: 946 3502 H</i>		<i>MSL above SD: 10.683 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 09/11</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 09/11</i>

1. No additional requirements.

9464212 Village Cove, AK**L27877****Part 23****PBM:** 946 4212 RBD 1**PBM above SD:** 9.074 m**GPS Bench Mark:** 946 4212 P**MSL above SD:** 0.974 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 10/11**Dive Inspection Frequency:** Dive not needed; station inspected using waders

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Replace zinc on each orifice pipe (the circular zinc fits 1 1/4" OD of pipe) and inspect both pipes for corrosion.
3. Inspect and if necessary, replace the stainless steel u-bolts that attach the 1 inch pipe to the ladder rungs. Use approximately 6 - 5/16"x 1 3/4" x 3" stainless steel u-bolts.

9468756 Nome, AK**L27877****Part 24****PBM:** 946 8756 SHEET PILE C**PBM above SD:** 5.611 m**GPS Bench Mark:** 946 8756 K**MSL above SD:** 1.375 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 06/11**Dive Inspection Frequency:** Every year**Last Dive:** 06/11

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Provide a description and photo of the Met SRM.

9491094 Red Dog, AK**L27877****Part 25****PBM:** 949 1094 A TIDAL**PBM above SD:** 4.696 m**GPS Bench Mark:** 949 1094 B**MSL above SD:** 1.719 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 10/11**Dive Inspection Frequency:** Every year**Last Dive:** 10/11

1. Verify the elevation difference between the digibub staff stop and the digibub orifices zero on an annual basis.
2. Measure the elevations of the wind sensors above the Met SRM.
3. Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.