

January 23, 2013

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: 2013 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 2013," 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 National 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 observing system data are used for NOS multi-purpose applications such as the Physical Oceanographic Real-Time Systems (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 budget situations in CO-OPS, and when operational decisions have to be made because of the lack of funding, FOD and the Engineering Division (ED) will consult and recommend a course of action.

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.

Prior to scheduling of each field trip, FOD and the Configuration and Operational Engineering Team (COET) 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, 2013 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 COET, submissions of the 1-day site report (e-site report, as applicable) and level abstract within one working day requirement applies to all annual maintenance and emergency maintenance activities for FOD and contractors. The 1-day site report will indicate if these requirements have been completed. Final documentation shall be submitted to COET 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. COET will evaluate the station package (final documentation) and then inform the documentation submitter of any corrective actions.

COET 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\2013 Documentation\2013 Stability Analysis for those who have access to CO-OPS' secure network. Task Managers should provide the reports to their IDIQ contractors, or COET will supply the report upon request.

Generally, when GPS observations are performed on the designated GPS Bench Mark (annually or every five years as indicated in the Part C), that mark shall be included in the level run for that year. This is important for connecting tidal, geodetic, and ellipsoidal datums. Some pre-planning for leveling routes and schemes (which marks will be connected each year based upon the GPS observations requirement) shall be investigated.

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.

This year FOD should take station photos which are free of debris, tools, and personnel. This effort will coincide with the release of the new CO-OPS webpage allowing the photos to be displayed at a standard size because they will be of better quality and resolution. The photos

required include: a general view, enclosure or shelter, interior of shelter, primary water level sensor and protective well/sump, if applicable please also photograph the Met mast, wind sensor, CORS antenna, SAE encoder and ETG.

24 stations in AK, WA, HI, and Pacific Islands have been selected for brown-out in CY 2013 and will not receive annual inspection. These 24 stations are Honolulu, Mokuoloe, Nawiliwili, Kahului, Hilo, Kawaihae, Kwajalein, Ketchikan, Sitka, Juneau, Skagway, Yakutat, Cordova, Valdez, Seward, Kodiak, Prudhoe Bay, Toke Point, Neah Bay, Port Angeles, Tacoma, Seattle, Friday Harbor, and Port Townsend (only levels will be run). The project instructions listed for all stations in Section A, B, and C provide the technical and operational requirements, and are do not involve budgetary considerations such as decided brown-out areas.

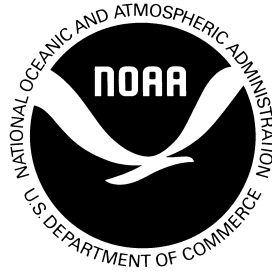
Also if a meteorological sensor fails, that sensor will not be repaired or replaced unless a trip is necessary and taken to repair a failed water level sensor at any station. This policy was instituted last year and is continuing for CY 2013.

CO-OPS has set an operational goal of 176 annual inspections in FY 2013; 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 2013 Combined Project Instructions for Coastal and Great Lakes Water Level Stations

January 2013

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 all 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 priority 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, is provided in the attached file, 2013 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 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 periodic 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

The requirements for the 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 (OCS), or the Remote Sensing Division (RSD) of the National Geodetic Survey (NGS). The coordination is generally done through Laura Rear McLaughlin, Mapping and Charting Program Manager (MCPM) and Jerry Hovis, Chief PSB, as CO-OPS’ representative for the tri-office survey support team. Since Laura is on LCDP assignment, Laurita Brown is currently acting as MCPM. 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 MCPM, in concurrence with the ED and OD/PSB/HPT.

According to CO-OPS' policy, NOAA platforms, CO-OPS personnel 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.

CO-OPS is in the process of transitioning the Microwave Water Level (MWWL) sensor to operations and a few stations where the transition is approved are listed in Section C. Generally, the acoustic or MWWL system shall be preferred for hydrographic or photogrammetric subordinate station installations. In cases where acoustic wells or MWWL sensor support arm 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 until testing of the MWWL sensor is completed, documented, and recommendations are made for its use in the Great Lakes.

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. Once the ED Observing Systems manager is hired, all observing system operations and planning will be coordinated through that person.

Reporting of NWLON performance metrics is coordinated in-house by David Lane of FOD. 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 David 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 System Verification
- Step 6: Operation and Maintenance
- Step 7: Operational Declaration, Data Management and Product Delivery
- Step 8: Assessment and Outreach

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

PART C: SPECIFIC REQUIREMENTS

1. Station Operational Groups

All operational NWLON and subordinate stations are listed in the Excel file “2013 Station Operational Lists.xls”. The file contains three worksheets: 1) 2013 NWLON Station Project Support Status; 2) 2013 NWLON Great Lakes Station Project Support Status; and 3) 2013 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 a reference for the field parties.

1.1. CY 2013 Reduced Diving Requirements for FOD Maintained Stations

An effort is being made to reduce the diving requirements in CY 2013 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 2013; 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.

In addition, 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 period 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 later. 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.

8467150	Bridgeport, CT – station to be relocated due to pier demolition in 2013.
8741533	Pascagoula NOAA Lab, MS
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 four (4) 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)
8762372	East Bank, Bayou LaBranche, LA (funding and plans for upgrading the station are being considered by FOD and the COASTAL program manager)
8771450	Galveston Pier 21, TX (to be upgraded by CBI using EM funding)

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

CO-OPS is collaborating with NGS to install a CORS site at the NWLON stations listed below. The east coast stations were selected jointly by NGS and CO-OPS as representatives of the longest data series. 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 2013 NWLON Station Project Support Status” of the Excel file “2013 Station Operational Lists.xls” identifies existing co-located NWLON/CORS sites.

1619910	Sand Island, Midway Islands (Planned - funding provided by NOAA OCO)
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1770000	Pago Pago, American Samoa (Planned - funding from NOAA OCO)
1820000	Kwajalein (Planned - funding from NOAA OCO)
1890000	Wake Island (Planned - funding from NOAA OCO)
8418150	Portland, ME
8534720	Atlantic City, NJ (Planned - funding from NOAA OCO)
8670870	Fort Pulaski, GA
8720218	Mayport (Bar Pilots Dock), FL
8723214	Virginia Key, FL (Planned - funding from NOAA OCO)
8729840	Penscola, FL ((Planned - funding from NOAA OCO)
9414290	San Francisco, CA (Planned - funding from NOAA OCO)
9435380	South Beach, OR
9451600	Sitka, AK (Planned - funding from NOAA OCO)
9455090	Seward, AK (Planned - funding from NOAA OCO)
9462620	Unalaska, AK (Planned - funding from NOAA OCO)
9468756	Nome, AK (Planned - funding from NOAA OCO)
9497645	Prudhoe Bay, AK (Planned - funding from NOAA OCO)
9755371	San Juan, PR (Planned - funding from NOAA OCO)
2695540	Bermuda (Planned - funding from NOAA OCO)

In FY13, CO-OPS will work with NGS not only to continue work on the Midway, Wake Island and San Francisco and to finalize the installations at Bermuda and Virginia Key, but will also begin work on two new CORS sites. CO-OPS and NGS envision FY13 as the second in a five year plan to complete the co-location of CORS station on all US GLOSS stations (that are NWLON sites). This work will include both installation of new antennas and making level connections between existing antennas and the tide station.

Several others require, at a minimum, a level connection between the tide station and an existing monument, and upon further assessment, may also need new CORS antennas. Progress will be reported by CO-OPS to the Climate Program Office throughout the year, and input will be sought on prioritization of the planned sites. It has been tentatively planned that the two sites which will be begun in FY13 (contracts funded for an FY13 installation) are Kwajalein and Pensacola.

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 2013 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 CY 2013

1.9.1. NWLON Supported Projects

The reimbursable projects in the following table are operating or will be operating in CY 2013 in support of reimbursable, partnership, and special projects. Specific station requirements are provided for these stations being maintained by CO-OPS.

Project Station Number	Station Name	Partner	Funding Number	Control Station 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
9761115	Barbuda	Antigua-Barbuda Meteorological Services	1BK6ECR	N/A

1.9.2. Potential COASTAL Project in Washington

The following stations are part of a COASTAL project currently under review between the CO-OPS and the Tulalip Tribe. Project Status will be updated as planning proceeds. Two of the four stations are planned for installation in CY 2013 and those details will be coordinated between POB and the COASTAL Program manager.

<u>Station Number</u>	<u>Name</u>
9447773	Tulalip Bay, WA
944XXXX	Priest Point, WA
944XXXX	Tulalip Shores, WA
944XXXX	Tulare Beach, WA

1.9.3. USACE+USGS+NOAA COASTAL Project

The following station provides support to the joint U.S. Army Corps of Engineers, U.S. Geological Survey, and NOAA COASTAL South Bay Salt Pond Restoration Project. CO-OPS has agreed to install a MWL sensor at Coyote Creek and operate and maintain the station.

<u>Station Number</u>	<u>Name</u>
9414575	Coyote Creek, CA

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, as approved.

1.11. Station, Bench Mark, and Met Photographs

COET 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, COET 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 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 FY13. 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 11-03	Mobile Bay Storm Surge (Funded through 9/30/2014)*
2.5.	Air-Sea Systems - Task 11-05	Mobile PORTS [®] (Funded through 9/30/2013)*
2.6.	Air-Sea Systems – Task XXVIII	Lower MS River PORTS [®] (Funded through 1/31/2013)*
2.7.	Woods Hole Group - Task 10-02	Narragansett PORTS [®] (Funded through 6/30/2013)*
2.8.	Woods Hole Group - Task 11-07	NY/NJ PORTS [®] (Funded through 3/30/2013)*
2.9.	Woods Hole Group - Task 12-01	Delaware River and Bay PORTS [®] (Funded through 2/28/2013)*
2.10.	Woods Hole Group – Task 12-06	Chesapeake Bay PORTS [®] (Funded through 6/30/2013)*Conrad
2.11.	Conrad Blucher Inst. - Task 12-03	Lake Charles PORTS [®] (Funded through 4/30/2013)*
2.12.	Conrad Blucher Inst. - Task 12-02	Pascagoula PORTS [®] (Funded through 4/30/2013)*
2.13.	Conrad Blucher Inst. - Task 09-02	Houston/Galveston PORTS [®] (Ends 1/31/2013)*
	Task 13-01	Houston/Galveston PORTS [®] (New task begins 2/1/2013)*
2.14.	Conrad Blucher Inst. - Task 10-04	Texas NWLON Stations (Funded through 8/31/2013)*
2.15.	FOD/AOB	Great Lakes Stations
2.16.	FOD/POB	Hawaii, Pacific Islands, West Coast, and 16 Alaska Stations
2.17.	JOA – Task 12-08	Ten Alaska Stations (Funded through 9/30/2014)*

* Existing status and the ending dates of the contract tasks are shown above, as tasks are re-competed and awarded, this information will be updated. **The following tasks operations and maintenance responsibility will be taken over by Atlantic Operations Group of the Field Operations Division after the funding period as listed above is over for Task 11-05 Mobile**

PORTS[®], Task XXVIII Lower MS River PORTS[®], Task 12-03 Lake Charles PORTS[®], and Task 12-02 Pascagoula PORTS[®].

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 2008, 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	L27535	Part 1
<i>PBM:</i> 841 0140 TIDAL 3 (PD0006)		<i>PBM above SD:</i> 15.685 m
<i>GPS Bench Mark:</i> EASTPORT 1989 (PID1179)		<i>MSL above SD:</i> 4.420 m
<i>GPS Observation Frequency:</i> Every 5 years		<i>Last GPS Observation Performed:</i> 10/09
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 08/12

- 1 Tighten the wind bird goalpost onto mast securely.

8411060 Cutler Farris Wharf, ME	L27535	Part 6
<i>PBM:</i> L68 (AJ2727)		<i>PBM above SD:</i> 10.005 m
<i>GPS Bench Mark:</i> 841 1060 A (AJ2727)		<i>MSL above SD:</i> 3.796 m
<i>GPS Observation Frequency:</i> Every 5 years		<i>Last GPS Observation Performed:</i> 08/11
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 08/11

- 1 Consider replacing the acoustic sensor with a pressure sensor or a Microwave sensor if relocating the well is not possible. Field crew did not find suitable relocation sites for the sensor.

8413320 Bar Harbor, ME	L27535	Part 3
<i>PBM:</i> 841 3320 TIDAL 13		<i>PBM above SD:</i> 7.544 m
<i>GPS Bench Mark:</i> 841 3320 TIDAL 1 (AI8315)		<i>MSL above SD:</i> 2.786 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> 07/12

- 1 Continue to inspect tide house for further deterioration, advise if new house is needed.

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

L27535

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 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 **FUNDING DEPENDENT:** The CT well is in place without the sensor installed. Remove the CT well if no longer needed.
- 3 Current PBM is a vertical mark, very hard to place a leveling rod on center. Change of PBM is recommended.

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

L27535

Part 5

PBM above SD: 10.000 m

MSL above SD: 5.961 m

Last GPS Observation Performed: 09/10

Last Dive: 07/12

- 1 **8419317 Wells, ME:** The CT well is in place without the sensor installed. Remove the CT well if no longer needed.

2.1.2. FOD/AOB – New Hampshire Stations

8423898 Fort Point, NH

L27536

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: 08/12

- 1 No additional requirements.

2.1.3. FOD/AOB – Massachusetts Stations

8443970 Boston, MA	L27537	Part 1
PBM: K 12 (MY0555)		PBM above SD: 6.858 m
GPS Bench Mark: 844 3970 D TIDAL (AJ4030)		MSL above SD: 2.660 m
GPS Observation Frequency: Every 5 years	Last GPS Observation Performed: 07/10	
Dive Inspection Frequency: Every year		Last Dive: 07/07

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 **Unresolved from 2011 Project Instructions:** Take face, setting, and location photos from two different cardinal directions of bench mark 844 3970 C.
- 3 **Unresolved from 2012 Project Instructions:** Consider contracting out dive operation at this station. This station has operated for 4 years without a dive inspection.

8447435 Chatham, MA	L27537	Part 5
PBM: 844 7435 B (AA7166)		PBM above SD: 5.861 m
GPS Bench Mark: 844 7435 B TIDAL		MSL above SD: 1.974 m
GPS Observation Frequency: Every 5 years	Last GPS Observation Performed: 09/10	
Dive Inspection Frequency: Every year		Last Dive: 08/12

- 1 No additional requirements.

8447930 Woods Hole, MA	L27537	Part 3
PBM: 844 7930 TIDAL 11 (LW1571)		PBM above SD: 3.447 m
GPS Bench Mark: 844 7930 B TIDAL (AJ4031)		MSL above SD: 1.096 m
GPS Observation Frequency: Every 5 years	Last GPS Observation Performed: 06/09	
Dive Inspection Frequency: Every year		Last Dive: 08/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.

8449130 Nantucket, MA	L27537	Part 4
PBM: 844 9130 TIDAL 25		PBM above SD: 3.147 m
GPS Bench Mark: 844 9130 K TIDAL (AJ4032)		MSL above SD: 1.454 m
GPS Observation Frequency: Every 5 years	Last GPS Observation Performed: 10/09	
Dive Inspection Frequency: Every year		Last Dive: 08/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.

2.1.4. FOD/AOB – Rhode Island Stations

8452660 Newport, RI (PORTS)	L27538	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: 06/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.

8454000 Providence, RI (PORTS)	L27538	Part 3
PBM: 845 4000 TIDAL 9 (LW0154)		PBM above SD: 4.475 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 Perform a recon to relocate the station. The concrete platform where station is now is deteriorating.
- 2 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 3 Jet the primary well by divers. The parallel plates are sitting in the silt.
- 4 Bench marks 6 RESET, A TIDAL, G TIDAL, L TIDAL, 845 4000 M, 845 4000 N, were searched for and not recovered in FY12 due to construction. Marks are thought to be destroyed. If not recovered in CY 13, mark them as destroyed on the bench mark diagram and update the bench mark descriptions.
- 5 Establish and level six new bench marks:
designation/stamping: 845 4000 P/4000 P 2013, 845 4000 Q/4000 Q 2013, 845 4000 R/4000 R 2013, 845 4000 S/4000 S 2013, 845 4000 T/4000 T 2013, and 845 4000 U/4000 U 2013.

2.1.5. FOD/AOB – Connecticut Stations

8461490 New London, CT (PORTS)	L27539	Part 1
PBM: 846 1490 B		PBM above SD: 5.032 m
GPS Bench Mark: 846 1490 K TIDAL (LX3418)		MSL above SD: 1.542 m
GPS Observation Frequency: Every 5 years	Last GPS Observation Performed: 11/09	
Dive Inspection Frequency: Every year		Last Dive: 08/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.

8467150 Bridgeport, CT	L27539	Part 3
PBM: 846 7150 A (AI1725)		PBM above SD: 3.544 m
GPS Bench Mark: 846 7150 D TIDAL (AJ4034)		MSL above SD: 1.708 m
GPS Observation Frequency: Every 5 years	Last GPS Observation Performed: 11/09	
Dive Inspection Frequency: Every year		Last Dive: 06/12

- 1 Station is planned to be relocated in summer 2013 due to pier demolition by the city of Bridgeport. Perform reconnaissance to re-locate the station before scheduling a site visit.
- 2 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 3 Replace the Bubbler Orifice.
- 4 If the station is not relocated in FY13, replace/repair the solar panel mast. Due to Hurricane Sandy, solar panel mast is bent.
- 5 There are only seven good marks in the network. Perform reconnaissance to install three additional marks so that the local leveling network will have total 10 marks.

2.1.6. FOD/AOB – New York Stations

8510560 Montauk, NY(PORTS)	L27540	Part 1
<i>PBM:</i> 851 0560 J (AH6725)		<i>PBM above SD:</i> 3.618 m
<i>GPS Bench Mark:</i> TIDAL 9 STA 2 50 (LW0831)		<i>MSL above SD:</i> 1.554 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 09/10	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 06/12

- 1 Station was affected by Hurricane Sandy. The station has endured significant water damage. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 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.

8516945 Kings Point, NY (PORTS)	L27540	Part 2
<i>PBM:</i> 851 6945 A		<i>PBM above SD:</i> 9.662 m
<i>GPS Bench Mark:</i> 851 6945 TIDAL 5		<i>MSL above SD:</i> 5.113 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> 07/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Due to water damage to the station by Hurricane Sandy, replace the DCP and DCP components. Refer to OPS Razor ticket Issue O..1-736.

8518750 The Battery, NY (PORTS)	L27540	Part 3
<i>PBM:</i> 851 8750 TIDAL 7 (AB6736)		<i>PBM above SD:</i> 5.470 m
<i>GPS Bench Mark:</i> R 340 (KV0587)		<i>MSL above SD:</i> 1.785 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> 07/12

- 1 Station was affected by Hurricane Sandy. Significant water inundation was identified within the station shelter. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 When field crew surveys the Aquatrak by using a ladder, which is supported by the well, that applies some level of pressure to the well and the Aquatrak leveling point elevation is affected. Use a stepSo plan to relocate or build access point to the Aquatrak sensor.

2.1.7. FOD/AOB – New Jersey Stations

8531680 Sandy Hook, NJ (PORTS)	L27541	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> 07/12

- 1 Station destroyed by Hurricane Sandy. FOD installed a temporary Hydro style gauge. Perform annual inspection for FY13.

8534720 Atlantic City, NJ	L27541	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 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 **Unresolved from 2012 Project Instructions:** Re-measure the elevation of the barometer above station datum (should be ~ 10 m, but is currently documented as 1.4 m).

8536110 Cape May, NJ (PORTS)	L27541	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> 07/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.

2.1.8 FOD/AOB – Pennsylvania Station

8545240 Philadelphia, PA (PORTS)

L27542

Part 2

PBM: 854 5240 A

PBM above SD: 4.688 m

GPS Bench Mark: 854 5240 C

MSL above SD: 2.228 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 09/09

Dive Inspection Frequency: Every year

Last Dive: 07/12

- 1 Recon was performed in 2011 to harden station, so collaborate with EDB to perform the hardening design of the station.
- 2 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 3 Recover bench marks 23 1922 ELEV. 7.894 FT, U 237 1959, and 35 1931 and comment within the eSite report the condition of the marks.
- 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.

2.1.9. FOD/AOB – Delaware Stations

8551910 Reedy Point, DE (PORTS)

L27543

Part 2

PBM: R 41 (JU2187)

PBM above SD: 2.031 m

GPS Bench Mark: 855 1910 G (AJ6314)

MSL above SD: 1.301 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 09/09

Dive Inspection Frequency: Every year

Last Dive: 07/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Measure the elevation of the 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.

8557380 Lewes, DE (PORTS)

L27543

Part 4

PBM: 855 7380 TIDAL 20 (AJ8038)

PBM above SD: 3.990 m

GPS Bench Mark: 855 7380 TIDAL 20 (AJ8038)

MSL above SD: 1.528 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 9/09

Dive Inspection Frequency: Every Year

Last Dive: 07/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 **Unresolved from 2012 Project Instructions: Replace the orifice at the station.**

2.1.10. FOD/AOB – Maryland and DC Stations

8570283 Ocean City Inlet, MD **L27544** **Part 1**
PBM: 857 0283 J TIDAL *PBM above SD:* 4.979 m
GPS Bench Mark: 857 0283 J TIDAL *MSL above SD:* 2.839 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* 05/09
Dive Inspection Frequency: Every year *Last Dive:* 04/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Replace or repair the primary well. Parallel plates are missing and the well is broken at the bottom.

8571421 Bishops Head, MD (COASTAL) **L27544** **Part 11**
PBM: 857 1421 A *PBM above SD:* 10.000 m
GPS Bench Mark: 857 1421 GRANGER *MSL above SD:* 9.114 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* 05/09
Dive Inspection Frequency: Every year *Last Dive:* 04/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 There are now seven bench marks installed at this station. Three more marks will need to be installed to complete the number of bench marks required for an NWLON station. Establish and level three new bench marks: designation/stamping: 857 1421 D/1421 D 2013, 857 1421 E/1421 E 2013, and 857 1421 F/1421 F 2013.
- 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.

8571892 Cambridge, MD **L27544** **Part 2**
PBM: 857 1892 D TIDAL (AC6854) *PBM above SD:* 3.344 m
GPS Bench Mark: 857 1892 D TIDAL (AC68540) *MSL above SD:* 1.060 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* 05/09
Dive Inspection Frequency: Every year *Last Dive:* 04/12

- 1 Perform recon to relocate the station to a more solid structure. The pier the station is located has deteriorated and is need of desperate repair.
- 2 Install one new surface disk: stamped 1982 G 2013.
- 3 Update the bench mark diagram and .des file.

8574680 Baltimore, MD (PORTS) **L27544** **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: 07/12*

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.

8575512 Annapolis, MD (PORTS) **L27544** **Part 6**
PBM: 857 5512 TIDAL 7 (HV0207) *PBM above SD: 2.877 m*
GPS Bench Mark: 857 5512 D TIDAL (AJ8035) *MSL above SD: 1.596 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 08/09*
Dive Inspection Frequency: Every year *Last Dive: 07/12*

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 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.

8577330 Solomons Island, MD (PORTS) **L27544** **Part 7**
PBM: 857 7330 E TIDAL (AJ8036) *PBM above SD: 4.456 m*
GPS Bench Mark: 857 7330 J *MSL above SD: 1.366 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 07/09*
Dive Inspection Frequency: Every year *Last Dive: 04/12*

- 1 Station was affected by Hurricane Sandy. Minor water inundation was discovered after the storm. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Measure the elevation of the water temperature sensor above Station Datum.

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

L27545

Part 1
PBM above SD: 4.115 m
MSL above SD: 1.859 m
Last GPS Observation Performed: 06/10
Last Dive: 07/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Upgrade the DCP flash card with a 512 megabyte or larger to support two 250MB .log files.
- 3 FY12 reconnaissance report indicated that two surface marks can be installed on the sea wall south of the stations between the pier and bench mark 859 4900 K to meet the minimum distance requirement. Establish and level two new bench marks:
designation/stamping: 859 4000 L/4900 L 2013 and 859 4000 M/4900 M 2013.

2.1.11. FOD/AOB – Virginia Stations

8631044 Wachapreague, VA

L27546

Part 1

PBM: 863 1044 B

PBM above SD: 4.130 m

GPS Bench Mark: 863 1044 K TIDAL (AJ4587)

MSL above SD: 1.401 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 07/09

Dive Inspection Frequency: Every year

Last Dive: Unknown

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Investigate back up water level sensor tube leak. Data from the Druck sensor is unreliable.

8632200 Kiptopeke, VA (PORTS)

L27546

Part 2

PBM: L 418 (FW0303)

PBM above SD: 4.093 m

GPS Bench Mark: 863 2200 B TIDAL (AJ4588)

MSL above SD: 1.539 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 03/09

Dive Inspection Frequency: Every year

Last Dive: 07/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Park service has expressed interest in a display outside of gauge so visitors could see water level data from the station in real time. Contact Daniel A. Jordan, Asst. Park Manager for further information at 757-331-3402. Do not install the display until the funding is identified, and the display is approved.
- 3 Attempt to fix phone modem/line. Contacting the DCP via phone modem is unsuccessful. Investigate feasibility of a wireless modem and installing an external antenna if necessary.

8635027 Dahlgren, Naval Proving Ground, VA

L27546

Part 3

PBM: TBD

PBM above SD: Undecided

GPS Bench Mark: TBD

MSL above SD: TBD

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: Unknown

Dive Inspection Frequency: Every year

- 1 Install the new NWLON station as approved by FERS. This station is for relocation of the destroyed Colonial Beach site.

8635750 Lewisetta, VA (PORTS)	L27546	Part 4
<i>PBM:</i> R 462 (GV0156)		<i>PBM above SD:</i> 2.874 m
<i>GPS Bench Mark:</i> 863 5750 J TIDAL (AJ4589)		<i>MSL above SD:</i> 1.685 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 07/09	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 07/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Replace the parallel plate bolts.
- 3 **Unresolved from 2012 Project Instructions:** Take location photos from two different cardinal directions of bench marks 863 5750 K, 863 5750 TIDAL 2, 863 5750 TIDAL 3 and 863 5750 TIDAL 5.

8637689 Yorktown, VA (PORTS)	L27546	Part 6
<i>PBM:</i> 863 7689 E		<i>PBM above SD:</i> 2.189 m
<i>GPS Bench Mark:</i> 863 7689 C		<i>MSL above SD:</i> 1.964 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 08/10	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 07/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 **Unresolved from 2012 Project Instructions:** Include the MET SRM in the level run.

8638610 Sewells Point, VA (PORTS)	L27546	Part 7
<i>PBM:</i> 863 8610 G TIDAL		<i>PBM above SD:</i> 4.314 m
<i>GPS Bench Mark:</i> 863 8610 F		<i>MSL above SD:</i> 1.748 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 05/10	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 07/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 **Unresolved from 2012 Project Instructions:** Verify the total length of the conductivity sensor well.

8638863 Chesapeake Bay Bridge Tunnel, VA (PORTS)

L27546

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: 07/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 **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. Please collaborate with ED to design the upgrade.

2.1.12. FOD/AOB – North Carolina Stations

8651370 Duck, NC **L27547** **Part 1**
PBM: 865 1370 B TIDAL, (FW0688) *PBM above SD:* 10.061 m
GPS Bench Mark: 865 1370 C (FW0686) *MSL above SD:* 6.202 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* 07/08
Dive Inspection Frequency: Every year *Last Dive:* 06/09

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Remove or fix the Conductivity sensor during the next dive. Sensor is not collecting data currently.

8652587 Oregon Inlet Marina, NC **L27547** **Part 5**
PBM: 865 2587 NO 3 TIDAL (EX0150) *PBM above SD:* 5.214 m
GPS Bench Mark: 865 2587 TIDAL A *MSL above SD:* 0.986 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* 08/08
Dive Inspection Frequency: Every year *Last Dive:* 05/07

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Re-describe bench mark 4.54 NPS RESET. The mark has been reset into a new gas pump concrete not holding previous elevation.

8654467 USCG Station Hatteras, NC **L27547** **Part 6**
PBM: 865 4467 C *PBM above SD:* 10.000
GPS Bench Mark: H 1 NC 79 *MSL above SD:* 8.482
GPS Observation Frequency: Every 5 years *Last GPS Observation Frequency:* 04/10
Dive Inspection Frequency: Every year *Last Dive:* 03/12

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Measure the elevation of the water temperature sensor above Station Datum.
- 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.
- 5 Include the barometer in the leveling run.

8656483 Duke Marine Lab, NC (COASTAL) **L27547** **Part 3**
PBM: 865 6483 NO 11 (AI9505) *PBM above SD:* 3.097 m
GPS Bench Mark: 865 6483 E TIDAL (DE7961) *MSL above SD:* 1.083 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* 08/08
Dive Inspection Frequency: Every year *Last Dive:* 01/11

- 1 Station was affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Perform dive in FY13.
- 3 Re-describe and take face, setting, and directional photos of bench mark NCCOS BEAUFORT. The current description references random trees near the area.

8658120 Wilmington, NC **L27547** **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 Recover bench marks 865 8120 TIDAL 4 and 865 8120 TIDAL 1.
- 2 Reset bench mark 865 8120 F. This mark is severely damaged.
- 3 Consider lowering Dive frequency. Notes from previous inspection state that marine growth is very low to none on the Well.
- 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.

8658163 Wrightsville Beach, NC **L27547** **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 No additional requirements.

2.1.13. FOD/AOB – South Carolina Stations

8661070 Springmaid Pier, SC	L27548	Part 1
<i>PBM:</i> 866 1070 J TIDAL (DD1542)		<i>PBM above SD:</i> 11.948 m
<i>GPS Bench Mark:</i> K 137 (DD0853)		<i>MSL above SD:</i> 9.754 m
<i>GPS Observation Frequency:</i> Every 5 years		<i>Last GPS Observation Performed:</i> 9/12
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 8/12

- 1 No additional requirements.

8662245 Oyster Landing, SC (COASTAL)	L27548	Part 8
<i>PBM:</i> 866 2245 A TIDAL (DD1345)		<i>PBM above SD:</i> 2.962 m
<i>GPS Bench Mark:</i> 866 2245 A TIDAL (DD1345)		<i>MSL above SD:</i> 2.031 m
<i>GPS Observation Frequency:</i> Every 5 years		<i>Last GPS Observation Performed:</i> 8/12
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 12/10

- 1 **FUNDING DEPENDENT:** 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 photos of the, DCPs; the Primary Sensor; and the Protective Well.
- 4 Check if CIL remotely updated the DCP software to allow Tsunami data transmission. If not, update DCP software during FY13 inspection.

8665530 Charleston, SC	L27548	Part 2
<i>PBM:</i> 866 5530 TIDAL 13 (CJ0085)		<i>PBM above SD:</i> 4.020 m
<i>GPS Bench Mark:</i> PORT 1962 (CJ0326)		<i>MSL above SD:</i> 1.733 m
<i>GPS Observation Frequency:</i> Every 5 years		<i>Last GPS Observation Performed:</i> 11/07
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 8/12

- 1 No additional requirements.

8667633 Clarendon Plantation, SC	L27548	Part 33
<i>PBM:</i> 866 7633 A (CK2205)		<i>PBM above SD:</i> 6.242 m
<i>GPS Bench Mark:</i> Undetermined		<i>MSL above SD:</i> 2.062 m
<i>GPS Observation Frequency:</i> Every 5 years		<i>Last GPS Observation Performed:</i> None
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 11/10

- 1 Perform GPS observations on the most observable mark in the network; there are no records of a GPS survey being done at this station since installation.
- 2 Include bench mark 866 7633 A TIDAL in the level run. The mark is recessed approximately 3 cm (1 inch) below ground surface.

2.1.14. FOD/AOB – Georgia Station

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

L27549

Part 1

PBM above SD: 4.877 m

MSL above SD: 2.230 m

Last GPS Observation Performed: 9/12

Last Dive: 11/10

- 1 Include the barometer in the leveling run.

2.1.15. FOD/AOB – Florida East Coast Stations

8720030 Fernandina Beach, FL

PBM: 872 0030 TIDAL 34 (BC0166)
GPS Bench Mark: CONTAINER (BC2488)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27550

Part 1

PBM above SD: 4.770 m
MSL above SD: 1.522 m
Last GPS Observation Performed: 01/09
Last Dive: 01/10

- 1 Recover bench mark TBM 872 0030 M. Description of the mark can be found in the .des file.
- 2 Relocate the solar panel mast. Current setup allows for persons passing by easy access to the solar panels.
- 3 Upgrade the old 5w solar panel with a 30w solar panel.
- 4 Replace the GOES antenna. Notes from previous station visits indicate the antenna is cracked.
- 5 Replace the 2" mast pipe and 2.5" X 1/4" S.S. U-bolts used to secure the solar panels with the standard muffler clamps.

8720218 Mayport Bar Pilots Dock, FL

PBM: 870 0218 A TIDAL (DI9221)
GPS Bench Mark: 872 0220 A TIDAL (BC2486)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27550

Part 2

PBM above SD: 5.000 m
MSL above SD: 3.516 m
Last GPS Observation Performed: 01/08
Last Dive: 12/11

- 1 **Unresolved from 2012 Project Instructions:** Measure the elevation of the wind and air temperature sensors above Met SRM.
- 2 **Unresolved from 2012 Project Instructions:** 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.
- 3 **Unresolved from 2012 Project Instructions:** Include the barometer in the leveling run.
- 4 Include bench mark 872 0218 B in the level run.

8721604 Trident Pier, FL

PBM: 872 1604 A
GPS Bench Mark: 872 1604 C TIDAL (AJ2449)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27550

Part 19

PBM above SD: 9.303 m
MSL above SD: 6.053 m
Last GPS Observation Performed: 06/09
Last Dive: 03/11

- 1 The PVC conduit is beginning to show signs of fatigue throughout the length from station to well. The joints are either apart, broken or loose. Replace the PVC conduit with aluminum conduit of an increased size.
- 2 Re run power and coms wires. Current wiring exposes the wires to the outside environment.
- 3 Update the Xpert DCP to the most recent operating system.

8722670 Lake Worth Pier, FL	L27550	Part 6
<i>PBM: P 317 (AD2724)</i>		<i>PBM above SD: 15.111m</i>
<i>GPS Bench Mark: N 317 RESET</i>		<i>MSL above SD: 9.602m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 06/10</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 02/12</i>

- 1 Investigate Relative Humidity sensor. Frequent flat lines occur. Refer to razor ticket O.1-430.

8723214 Virginia Key, FL	L27550	Part 5
<i>PBM: 872 3214 B (AH5251)</i>		<i>PBM above SD: 5.000 m</i>
<i>GPS Bench Mark: 872 3214 E</i>		<i>MSL above SD: 3.431 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 02/09</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 02/11</i>

- 1 **Unresolved from 2011 Project Instructions:** Provide handheld GPS positions in DDMMSS.S format for bench mark 872 3214 MI 6 RESET.
- 2 **Unresolved from 2012 Project Instructions:** Measure the elevation of the wind and air temperature sensors above Met SRM. (Task requires three people on a team to take down the tower to measure the elevation of the sensors. That or the crew will need adequate climbing gear to climb the tower)

8723970 Vaca Key, FL	L27550	Part 7
<i>PBM: 872 3970 M TIDAL (AA1706)</i>		<i>PBM above SD: 2.285 m</i>
<i>GPS Bench Mark: R 273 (AA0302)</i>		<i>MSL above SD: 0.931 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 06/09</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 04/11</i>

- 1 **Unresolved from 2012 Project Instructions:** Take setting photos of bench marks 872 3970 A TIDAL, 872 3970 B TIDAL.
- 2 Provide the handheld GPS position in DDMMSS.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 COET.
- 4 Install some new bench marks (at least one 3D rod mark), including a candidate for a new PBM.
- 5 Bench marks TIDAL 1 and TIDAL 2 seem to be destroyed. Crew should attempt to recover these marks in FY13. If crew cannot recover the marks, crew should mark them destroyed and set two new marks to replace them with stamping 3970 Q 2013 and 3970 R 2013. Update bench mark diagram.

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

L27550

Part 8

PBM above SD: 3.116 m

MSL above SD: 1.662 m

Last GPS Observation Performed: 06/09

Last Dive: 12/11

- 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@tampona.com.
- 2 The anemometer has deteriorated and needs to be removed.
- 3 Measure water temperature sensor elevation on Station Datum.

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

2695540 Bermuda Esso Pier	L27560	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> 1.434 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 No additional requirements

9751364 Christiansted Harbor, St. Croix, VI	L27556	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> 01/12

- 1 Station may have been affected by Hurricane Sandy, please check with local contact before AI. Also check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Investigate Barometer sensor data issues. The sensor is reading high values.
- 3 Investigate Water Temperature sensor data issues. Refer to Razor Ticket O..1-714.
- 4 Establish and level two 3D rod marks, designation/stamping as follows: 975 1364 K/1364 K 2013, 975 1364 M/1364 M 2013.
- 5 Take digital photos of the setting (waist or chest high view) and general location of bench marks 975 1364 H and 975 1364 J. Take face, setting, and location photos for any newly established marks.
- 6 Update the bench mark diagram with the new bench marks.
- 7 Update the .des file removing the “975” from the stamping field of the newly set bench marks 975 1364 H and 975 1364 J. Disregard if actual stamping on disc face includes “975”.

9751381 Lameshur Bay, St John, VI
PBM: 975 1381 A
GPS Bench Mark: 975 1381 A
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27556

Part 4

PBM above SD: 10.000 m

MSL above SD: 8.924 m

Last GPS Observation Performed: 03/08

Last Dive: 02/12

- 1 Station may have been affected by Hurricane Sandy, please check with local contact before AI. Also check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Re-measure the elevation of the barometer above station datum (should be at an elevation of ~11 m -12 m, current elevation documented as 1.4 m).
- 3 Measure the elevation of the water temperature sensor above the Station Datum.

9751401 Lime Tree Bay, St. Croix, VI **L27556** **Part 1**

PBM: 975 1401 M

GPS Bench Mark: 975 1401 M

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

PBM above SD: 13.612 m

MSL above SD: 10.501 m

Last GPS Observation Performed: 02/08

Last Dive: 02/11

- 1 Station may have been affected by Hurricane Sandy, please check with local contact before AI. Also check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Collaborate with ED to design the rebuilding the gauge house, and seek FERS approval. Station install may need to be done in CY 2014 based upon the available funding.
- 3 Replace conduit from station to primary well with liquid tight.

9751639 Charlotte Amalie, St. Thomas, VI

L27556

Part 2

PBM: 975 1639 F

GPS Bench Mark: 975 1639 M (TV1548)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

PBM above SD: 3.267 m

MSL above SD: 1.715 m

Last GPS Observation Performed: 02/07

Last Dive: 02/12

- 1 Station may have been affected by Hurricane Sandy, please check with local contact before AI. Also check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 **FUNDING DEPENDENT:** Rebuild gauge house with custom aluminum stand and aluminum box.
- 3 Verify bench marks 975 1639 TIDAL 3 and 975 1639 TIDAL 5 are destroyed. If destroyed, remove the marks from .des file and update bench mark diagram.
- 4 Measure the elevation of the water temperature sensor above the Station Datum.

9752235 Culebra, PR **L27555** **Part 6**
PBM: 975 2235 D *PBM above SD: 9.490 m*
GPS Bench Mark: 975 2235 D *MSL above SD: 8.514 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 03/08*
Dive Inspection Frequency: Every year *Last Dive: 02/12*

- 1 Station has been affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
- 3 Replace the Backup Orifice. Contact C. Metzger for drawing and measurements of Orifice specifications.
- 4 Investigate Aquatrak data issues. The station is not plotting tidal curves.
- 5 Investigate intermittent GPS syncs. Change GOES flag for the backup battery voltage to "<".
- 6 Replace locking top hat bolt for the Aquatrak well.
- 7 Remove bench mark 975 2235 A from the .des file and the bench mark Diagram.

9752695 Vieques Island, PR **L27555** **Part 7**
PBM: 975 2695 A TIDAL *PBM above SD: 10.000 m*
GPS Bench Mark: 975 2695 A TIDAL *MSL above SD: 8.041 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 03/08*
Dive Inspection Frequency: Every year *Last Dive: 02/12*

- 1 Station has been affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
- 3 **Unresolved from 2012 Project Instructions:** Take photos showing handheld GPS coordinates at 975 2695 C and 975 2695 F.

9755371 San Juan, PR **L27555** **Part 3**
PBM: 975 5371 A TIDAL (TV1513) *PBM above SD: 2.600 m*
GPS Bench Mark: 975 5371 M *MSL above SD: 1.266 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 03/08*
Dive Inspection Frequency: Every year *Last Dive: 02/12*

- 1 Station has been affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
- 3 **Unresolved from 2012 Project Instructions:** Take photos showing handheld GPS coordinates at 975 5371 B TIDAL and 975 5371 J TIDAL.

9759110 Magueyes Island, PR**L27555****Part 4****PBM:** 975 9110 BM 1**PBM above SD:** 4.755 m**GPS Bench Mark:** 975 9110 G**MSL above SD:** 1.191 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 02/08**Dive Inspection Frequency:** Every year**Last Dive:** 01/12

- 1 Station has been affected by Hurricane Sandy. Check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 2 Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
- 3 **Unresolved from 2012 Project Instructions:** Re-measure the elevation of the barometer above station datum (should be ~ 6 - 7 m, but is currently documented as 1 m).
- 4 Re-measure the elevation of the wind and air temperature sensors above MET SRM.
- 5 **Unresolved from 2012 Project Instructions:** Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
- 6 Investigate IP modem issues. Connecting to the station via the IP modem does not work.
- 7 Take photos showing handheld GPS coordinates for all bench marks.

9759412 Aguadilla Pier, PR**L27555****Part 8****PBM:** 975 9412 TIDAL 3 (DE5552)**PBM above SD:** 10.000 m**GPS Bench Mark:** 975 9412 E**MSL above SD:** 7.087 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 02/08**Dive Inspection Frequency:** Every year**Last Dive:** 01/11

- 1 Station **destroyed** by Hurricane Sandy : FOD to develop plans for either temporary or permanent station.
- 2 **FUNDING DEPENDENT:** Perform reconnaissance for possible relocation of the station.

9759938 Mona Island, PR**L27555****Part 9****PBM:** 975 9938 A**PBM above SD:** 10.000 m**GPS Bench Mark:** 975 9938 F**MSL above SD:** 8.846 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 02/08**Dive Inspection Frequency:** Every year**Last Dive:** 01/12

- 1 Please coordinate with the PRSN project manager - James Taylor, and the COASTAL Program Manager, prior to performing annual inspections in Puerto Rico.
- 2 Station may have been affected by Hurricane Sandy, please check with local contact before AI. Also check the status of the station referring to the document **HurricaneSandyStations_Initial_Findings.xlsx**.
- 3 **Unresolved from 2012 Project Instructions:** Take photos showing handheld GPS coordinates for all bench marks.
- 4 Replace the Iridium modem. Connecting to the station via the Iridium modem does not work.

9761115 Barbuda

PBM: 976 1115 A

GPS Bench Mark: 976 1115 J

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27964

Part 9

PBM above SD: 10.000 m

MSL above SD: 8.651 m

Last GPS Observation Performed: 08/12

Last Dive: 06/11

- 1 Investigate/repair possible damage to pressure orifices due to collapsed pier.

2.3. FOD/AOB – 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).

The operations and maintenance responsibility for the stations listed under Task 11-05 Mobile PORTS®, Task XXVIII Lower MS River PORTS®, Task 12-03 Lake Charles PORTS®, Task 12-02 Pascagoula PORTS® will be taken over by AOB after the funded time period is over as listed in Section 2.0.

8725110 Naples, FL	L27550	Part 9
<i>PBM: 872 5110 TIDAL 7 (AD5731)</i>		<i>PBM above SD: 4.225 m</i>
<i>GPS Bench Mark: 872 5110 C TIDAL (AD6337)</i>		<i>MSL above SD: 1.155 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 05/09</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 01/12</i>

- 1 Measure Water Temperature on SD.

8725520 Fort Myers, FL	L27550	Part 10
<i>PBM: 872 5520 A TIDAL (AD7888)</i>		<i>PBM above SD: 2.746 m</i>
<i>GPS Bench Mark: 872 5520 A TIDAL (AD7888)</i>		<i>MSL above SD: 1.522 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 04/09</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 01/12</i>

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

8726384 Port Manatee, FL (PORTS)	L27550	Part 20
<i>PBM: 872 6384 E (AG7341)</i>		<i>PBM above SD: 2.6660 m</i>
<i>GPS Bench Mark: 872 6384 E</i>		<i>MSL above SD: 0.417 m</i>
<i>GPS Observation Frequency: Every 5 years</i>	<i>Last GPS Observation Performed: 04/09</i>	
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 02/11</i>

- 1 Measure elevation of wind and temperature sensor elevation above MET SRM.

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

L27550

Part 11

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

Last GPS Observation Performed: 04/09
Last Dive: 01/12

- 1 **Unresolved from 2012 project instructions:** Obtain Photos: 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.
- 2 **Unresolved from 2012 project instructions:** 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.
- 3 **Unresolved from 2012 project instructions:** 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

L27550

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 McKay Bay Entrance, FL (PORTS)

L27550

Part 22

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

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

Last GPS Observation Performed: 04/09
Last Dive: 7/12

- 1 Install a bubbler.

8726724 Clearwater Beach, FL
PBM: LP 10 1 FLHD (AG7197)
GPS Bench Mark: 872 6724 R 44 (AG6373)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27550

Part 12

PBM above SD: 2.234 m
MSL above SD: 0.970 m

Last GPS Observation Performed: 04/09
Last Dive: 01/12

- 1 **Unresolved from 2010 Project Instructions:** Establish and level a 3D rod mark, designation/stamping 872 6724 R/6724 R 2013. Update the bench mark diagram and take digital photos of the setting, face, and general location.
- 2 **Unresolved from 2012 Project Instructions:** Verify the primary DCP serial number.
- 3 **Unresolved from 2012 Project Instructions:** Measure the elevation of the wind and air temperature sensors above Met SRM.
- 4 **Unresolved from 2012 Project Instructions:** Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8727520 Cedar Key, FL
PBM: TIDAL STATION 3-60 TIDAL 8 (AR1204)
GPS Bench Mark: 872 7520 L
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27550

Part 13

PBM above SD: 2.347 m
MSL above SD: 1.171 m

Last GPS Observation Performed: 11/10
Last Dive: 10/12

- 1 **Unresolved from 2011 Project Instructions:** Take face, setting, and location photos of Bench Mark FDNR 1.
- 2 Remove Bench Mark 872 7520 from the Bench Mark diagram.
- 3 Provide a photo of the Met SRM.

8728690 Apalachicola, FL **L27550** **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: 11/12*

- 1 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. Contact OET for bench mark descriptions.

8729108 Panama City, FL **L27550** **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: 6/12*

- 1 Include bench mark J290 FLHD in level run.

8729210 Panama City Beach, FL **L27550** **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 2013 by FOD.
- 2 Install the new NWLON station using dual Paros primary WL sensors with pressure backup WL sensor, and full met sensor suite. Need FERS approval.

8729840 Pensacola, FL **L27550** **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: 06/12*

- 1 No further requirements.

8732828 Weeks Bay, AL (COASTAL)
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 7437 E (AB7179)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27552

Part 3

PBM above SD: 2.473 m

MSL above SD: 0.990 m

Last GPS Observation Performed: 09/10

Last Dive: 08/12

- 1 No further requirements.

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

L27553

Part 2

PBM above SD: 10.000 m

MSL above SD: 9.361 m

Last GPS Observation Performed: 09/12

Last Dive: 09/12

- 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.

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

L27553

Part 35

PBM above SD: 10.000m

MSL above SD: 9.744m

Last GPS Observation Performed: 09/11

Last Dive: 09/11

- 1 Include bench mark 876 1305 A in level run.
- 2 Measure the water temperature sensor above station datum.

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

L27553 **Part 1**
PBM above SD: 2.810 m
MSL above SD: 1.980 m
Last GPS Observation Performed: 10/11
Last Dive: 11/12

- 1 No further requirements.

8761927 USCG New Canal Station, LA
PBM: ALCO (BJ1342)
GPS Bench Mark: ALCO (BJ1342)
GPS Observation Frequency: Every year
Dive Inspection Frequency: Every year

L27553 **Part 10**
PBM above SD: 3.149 m
MSL above SD: 1.375 m
Last GPS Observation Performed: 11/12
Last Dive: 11/10

- 1 **Unresolved From 2012 Project Instructions:** Recover, level, take face photos and provide the handheld GPS positions in DDMSS.S format for bench marks 876 1927 A, 876 1927 B, and X 374. If these bench marks cannot be recovered, mark them destroyed.
- 2 Provide a description 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

L27553 **Part 33**
PBM above SD: 10.000 m
MSL above SD: 9.183 m
Last GPS Observation Performed: 10/12
Last Dive: 10/11

- 1 No additional requirements.

8762372 East Bank 1, Bayou LaBranche, LA

PBM: 876 2372 E

GPS Bench Mark: 876 2372 E

GPS Observation Frequency: Every year

Dive Inspection Frequency: Every year

L27553

Part 3

PBM above SD: 10.000 m

MSL above SD: 9.887 m

Last GPS Observation Performed: 11/10

Last Dive: 11/10

- 1 **FUNDING DEPENDENT:** Please coordinate the annual inspection with the COASTAL Program Manager.
- 2 **FUNDING DEPENDENT:** Upon rebuild of station replace existing primary sensor with the approved MWWL sensor and if any structural modifications, seek Field Engineering Review Subcommittee (FERS) approval. The existing primary sensor must not be removed until CO-OPS has completed the comparison. This may need to be done in CY 14 depending upon the funding.
- 3 **FUNDING DEPENDENT:** Upon rebuild of station install a full met sensor suite for the upgrade to NWLON status.
- 4 **FUNDING DEPENDENT:** Upon rebuild of station 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)

PBM: 876 2482 A

GPS Bench Mark: 876 2482 G

GPS Observation Frequency: Every year

Dive Inspection Frequency: Every year

L27553

Part 4

PBM above SD: 10.000 m

MSL above SD: 9.662 m

Last GPS Observation Performed: 11/11

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.
- 5 Measure the elevation of the barometer above station datum.
- 6 Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

8764044 Berwick, LA
PBM: 876 4044 E
GPS Bench Mark: 876 4044 E
GPS Observation Frequency: Every year
Dive Inspection Frequency: Every year

L27553

Part 34

PBM above SD: 5.000 m
MSL above SD: 5.934 m

Last GPS Observation Performed: 04/12
Last Dive: 04/12

- 1 Measure the elevation of the wind and air temperature sensors above Met SRM. Measure the elevation of the barometer and water temperature sensor above station datum.
- 2 Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.
- 3 Future work requirements will likely include the installation of five additional 3D rod marks with the designations 876 4044 H, 876 4044 J, 876 4044 K, 876 4044 M, and 876 4044 N.

8764227 LAWMA, Amerada Pass, LA
PBM: 876 4227 A
GPS Bench Mark: GPS GAGE 36 (DJ9384)
GPS Observation Frequency: Every year
Dive Inspection Frequency: Every year

L27553

Part 11

PBM above SD: 8.759 m
MSL above SD: 7.374 m

Last GPS Observation Performed: 06/12
Last Dive: 11/12

- 1 Coordinate with LSRC and NGS for the installation of a CORS site on the Sentinel – ED engineers will manage this task.
- 2 Replace back up water level sensor.

8766072 Freshwater Canal Locks, LA
PBM: 876 6072 A (DJ9334)
GPS Bench Mark: 876 6072 C
GPS Observation Frequency: Every year
Dive Inspection Frequency: Every year

L27553

Part 8

PBM above SD: 8.887m
MSL above SD: 6.773m

Last GPS Observation Performed: 10/10
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 mark 876 6072 B.
- 3 Measure the elevation of the wind and air temperature sensors above Met SRM.
- 4 Measure the elevation of 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.

2.4. Air-Sea Systems - Task 11-03: Mobile Bay Storm Surge
Jim Lewis, Task Manager/Technical Representative (TR)

8735391 Dog River Bridge, AL	L27551	Part 12
<i>PBM: 873 5391 E</i>		<i>PBM above SD: 10.000 m</i>
<i>GPS Bench Mark: 873 5391 E</i>		<i>MSL above SD: 9.102 m</i>
<i>GPS Observation Frequency: Every year</i>		<i>Last GPS Observation Performed: 9/12</i>
Dive Inspection Frequency: N/A		

- 1 No additional requirements.

8735523 East Fowl River Bridge, AL	L27551	Part 13
<i>PBM: 873 5523 C</i>		<i>PBM above SD: 10.000 m</i>
<i>GPS Bench Mark: 873 5523 C</i>		<i>MSL above SD: 4.351 m</i>
<i>GPS Observation Frequency: Every year</i>		<i>Last GPS Observation Performed: 9/12</i>
Dive Inspection Frequency: N/A		

- 1 No additional requirements.

8737138 Chickasaw Creek, AL	L27551	Part 11
<i>PBM: No Stamp DOT 1</i>		<i>PBM above SD: 11.815 m</i>
<i>GPS Bench Mark: 873 7138 A</i>		<i>MSL above SD: 7.761 m</i>
<i>GPS Observation Frequency: Every year</i>		<i>Last GPS Observation Performed: 12/11</i>
Dive Inspection Frequency: Every year		<i>Last Dive: 11/11</i>

- 1 PBM has been changed since the level run installation. Please be sure to use the new PBM and elevation listed above.

8738043 West Fowl River Bridge, AL	L27551	Part 14
<i>PBM: 873 8043 E 482</i>		<i>PBM above SD: 10.000 m</i>
<i>GPS Bench Mark: 873 8043 E 482</i>		<i>MSL above SD: 6.211 m</i>
<i>GPS Observation Frequency: Every year</i>		<i>Last GPS Observation Performed: 9/12</i>
Dive Inspection Frequency: N/A		

- 1 No additional requirements.

8739803 Bayou LaBatre, AL
PBM: 873 9803 A
GPS Bench Mark: 873 9803 A
GPS Observation Frequency:
Dive Inspection Frequency:

L27551

Part 14

PBM above SD: 10.000 m

MSL above SD: 8.393 m

Last GPS Observation Performed: 09/12

Last Dive: 09/12

- 1 No additional requirements.

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

The operations and maintenance responsibility for the stations listed under Task 11-05 Mobile PORTS®, will be taken over by AOB after the funded time period is over as listed in Section 2.0.

8735180 Dauphin Island, AL (PORTS)	L27551	Part 1
<i>PBM: 873 5180 TIDAL 1 (BH1756)</i>		<i>PBM above SD: 6.288 m</i>
<i>GPS Bench Mark: 873 5180 21D – 2E</i>		<i>MSL above SD: 1.049 m</i>
<i>GPS Observation Frequency: Every year</i>		<i>Last GPS Observation Performed: 09/12</i>
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 09/12</i>

- 1 The platform needs to have some reworking of materials and bracing of some of the handrails.

8736897 Coast Guard Sector Mobile, AL (PORTS)	L27551	Part 7
<i>PBM: 873 6897 A</i>		<i>PBM above SD: 10.000 m</i>
<i>GPS Bench Mark: 873 6897 C</i>		<i>MSL above SD: 8.986 m</i>
<i>GPS Observation Frequency: Every year</i>		<i>Last GPS Observation Performed: 9/12</i>
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 9/12</i>

- 1 No further requirements.

8737048 Mobile State Docks, AL (PORTS)	L27551	Part 10
<i>PBM: 873 7048 C</i>		<i>PBM above SD: 2.083 m</i>
<i>GPS Bench Mark: 873 7048 E</i>		<i>MSL above SD: 0.695 m</i>
<i>GPS Observation Frequency: Every year</i>		<i>Last GPS Observation Performed: 09/12</i>
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 10/12</i>

- 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.

2.6. Air-Sea Systems - Task XXVIII: Lower Mississippi River PORTS®
Jim Lewis, Task Manager/Technical Representative (TR)

The operations and maintenance responsibility for the stations listed under Task XXVIII Lower MS River PORTS® will be taken over by AOB after the funded time period is over as listed in Section 2.0

8760721 Pilottown, LA (PORTS)	L27553	Part 40
<i>PBM: 876 0721 D</i>		<i>PBM above SD: 1.666 m</i>
<i>GPS Bench Mark: 876 0721 D</i>		<i>MSL above SD: 1.553 m</i>
<i>GPS Observation Frequency: Every year</i>		<i>Last GPS Observation Performed: 07/12</i>
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 07/12</i>

- 1 Measure the elevation of the water temperature sensor above station datum.

8761955 Carrollton, LA (PORTS)	L27553	Part 36
<i>PBM: DISTRICT 1 A (AU2196)</i>		<i>PBM above LWRP: 3.075 m</i>
<i>GPS Bench Mark: DISTRICT 1 A (AU2196)</i>		<i>MSL above SD: Unknown</i>
<i>GPS Observation Frequency: Every year</i>		<i>Last GPS Observation Performed: 11/12</i>
<i>Dive Inspection Frequency: Every year</i>		<i>Last Dive: 10/10</i>

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
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- 1 No additional requirements.

8762002 Huey Long Bridge, LA (PORTS)	Air Gap Station
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ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12

- 1 No additional requirements.

2.7. Woods Hole Group - Task 10-02: Narragansett PORTS®
Brad Wynn, Task Manager/Technical Representative (TR)

8447386 Fall River, MA (PORTS)	L27537	Part 2
PBM: STATE (LW2264)		PBM above SD: 10.000 m
GPS Bench Mark: 844 7386 A		MSL above SD: 7.028 m
GPS Observation Frequency: Every 5 years	Last GPS Observation Performed: 10/09	
Dive Inspection Frequency: Every year		Last Dive: 01/12

- 1 No additional requirements.

8452944 Conimicut Light, RI (PORTS)	L27538	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: 08/12

- 1 Measure the elevation of the air temperature sensor above Met SRM.

8454049 Quonset Point, RI (PORTS)	L27538	Part 4
PBM: 845 4049 D		PBM above SD: 10.000 m
GPS Bench Mark: 845 4049 D		MSL above SD: 7.587 m
GPS Observation Frequency: Every 5 years	Last GPS Observation Performed: 10/09	
Dive Inspection Frequency: Every year		Last Dive: 08/12

- 1 The bottom clamp of the primary well is missing the hardware to attach the clamp to concrete bulkhead. At low tide, the clamp is above water surface. Secure the clamp using SS redheads to the concrete bulkhead.
- 2 Currently four bench marks exist in the network. Establish and level to a new bench mark: designation/stamping: 845 4049 F/4049 F 2013

8465705 New Haven, CT (PORTS)	L27539	Part 2
PBM: 846 5705 D		PBM above SD: 10.000 m
GPS Bench Mark: 846 5705 C		MSL above SD: 6.630 m
GPS Observation Frequency: Every 5 years	Last GPS Observation Performed: 11/09	
Dive Inspection Frequency: Every year		Last Dive: 06/12

- 1 No additional requirements.

2.8. **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.

8519461 Bayonne Bridge Air Gap, NY (PORTS)

Air Gap Station

ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12

- 1 No additional requirements.

8519483 Bergen Point, NY (PORTS)

L27540

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: 07/12

- 1 Perform reconnaissance to relocating station. The pier conductivity sensor is sitting on is destroyed or is lightly damaged.
- 2 **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).
- 3 **Unresolved from 2009 Project Instructions:** Repair AC feed at bulkhead. Contact property owner to repair AC.
- 4 **Unresolved from 2010 Project Instructions:** Recover or establish and level two surface marks, designation/stamping as follows if new mark(s): 851 9483 J/9483 J 2012 and 851 9483 K/9483 K 2012.

2.9. Woods Hole Group - Task 08-03: Delaware River and Bay PORTS[®]

Brad Wynn, Task Manager/Technical Representative (TR)

8537121 Ship John Shoal, NJ (PORTS)

L27541

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: 07/12

- 1 No additional requirements.

8538886 Tacony-Palmyra, NJ (PORTS)

L27541

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: 07/12

- 1 No additional requirements.

8539094 Burlington Bridge, NJ (PORTS)

L27541

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: 07/12

- 1 Replace the solar panel for the Xpert DCP. It has shattered glass.
- 2 Update the To Reach statement. The current To Reach statement was written for the old station at the power plant; the PORTS station is now on the center tower bridge fender.

8540433 Marcus Hook, PA (PORTS)

L27542

Part 1

PBM: 854 0433 E

PBM above SD: 10.000 m

GPS Bench Mark: 854 0433 E

MSL above SD: 7.539 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 09/09

Dive Inspection Frequency: Every year

Last Dive: 07/12

- 1 **Unresolved from 2012 Project Instructions:** Recover or establish and level two surface marks with the designation/stamping as follows: 854 0433 H/0433 H 2013 and 854 0433 J/0433 J 2013.

8548989 Newbold, PA (PORTS) **L27542** **Part 3**
PBM: 854 8989 A *PBM above SD: 10.000 m*
GPS Bench Mark: 854 8989 A *MSL above SD: 5.693 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 09/09*
Dive Inspection Frequency: Every year *Last Dive: 07/12*

- 1 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.

8551762 Delaware City, DE (PORTS) **L27543** **Part 1**
PBM: 855 1762 C *PBM above SD: 10.000 m*
GPS Bench Mark: 855 1762 E *MSL above SD: 7.727 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 09/09*
Dive Inspection Frequency: Every year *Last Dive: 07/12*

- 1 No additional requirements.

8555889 Brandywine Shoal Light, DE (PORTS) **L27543** **Part 3**
PBM: 855 5889 A *PBM above SD: 10.3975 m*
GPS Bench Mark: N/A *MSL above SD: 6.583 m*
GPS Observation Frequency: (Waived – not feasible)
Dive Inspection Frequency: Every year *Last Dive: 07/12*

Station was destroyed by Hurricane Sandy: PORTS manager and FOD will determine the future status of this station.

2.10. Woods Hole Group - Task 12-06: Chesapeake Bay PORTS®

8551911 Reedy Point Air Gap, DE (PORTS)

Air Gap Station

- 1 No additional requirements.

8573364 Tolchester Beach, MD (PORTS)

L27544

Part 3

PBM: 857 3364 A

PBM above SD: 2.963 m

GPS Bench Mark: 857 3364 B TIDAL (AJ8034)

MSL above SD: 1.294 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 08/09

Dive Inspection Frequency: Every year

Last Dive: 7/12

- 1 Inspect the Aquatrak well. During the last AI, divers removed sediment around the well.

8573927 Chesapeake City, MD (PORTS)

L27544

Part 4

PBM: U 2 (JU1833)

PBM above SD: 3.158 m

GPS Bench Mark: 857 3927 D (PID)

MSL above SD: 1.426 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: 08/08

Dive Inspection Frequency: Every year

Last Dive: 07/12

- 1 Include bench mark NO 3 1972 in the level run.

8573928 Chesapeake City Air Gap, MD (PORTS)

Air Gap Station

- 1 No additional requirements.

8575432 Bay Bridge Air Gap, MD (PORTS)

Air Gap Station

- 1 No additional requirements.

8636580 Windmill Point, VA (PORTS)

L27643

Part 5

PBM: 863 6580 E

PBM above SD: 2.189 m

GPS Bench Mark: Undetermined

MSL above SD: 0.903 m

GPS Observation Frequency: Every 5 years

Last GPS Observation Performed: Undetermined

Dive Inspection Frequency: Every year

Last Dive: 07/12

- 1 **Unresolved from 2011 Project Instructions:** Take location photos from two different cardinal directions of bench mark 863 6580 SRM. Do not confuse 863 6580 SRM with MET SRM.

8639348 Money Point, VA (PORTS)

L27546

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: 07/12

- 1 No additional requirements.

2.11. Conrad Blucher Institute - Task 12-03: Lake Charles PORTS®
Jim Lewis, Task Manager/Technical Representative (TR)

The operations and maintenance responsibility for the stations listed under Task 12-03 Lake Charles PORTS® will be taken over by AOB after the funded time period is over as listed in Section 2.0

8767816 Lake Charles, LA (PORTS)	L27553	Part 9
<i>PBM:</i> A 269 (BK1489)		<i>PBM above SD:</i> 10.000 m
<i>GPS Bench Mark:</i> CIVIC (BK3291)		<i>MSL above SD:</i> 8.283m
<i>GPS Observation Frequency:</i> Every year		<i>Last GPS Observation Performed:</i> 09/12
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 09/12

- 1 Investigate moving the Aquatrak protective well.
- 2 **Unresolved from 2012 Project Instructions:** Measure the elevation of the air temperature sensors above Met SRM.

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

ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12

- 1 No additional requirements.

8767961 Bulk Terminal, LA (PORTS)	L27553	Part 15
<i>PBM:</i> 876 7961 C		<i>PBM above SD:</i> 10.000 m
<i>GPS Bench Mark:</i> 876 7961 C		<i>MSL above SD:</i> 7.278 m
<i>GPS Observation Frequency:</i> Every year		<i>Last GPS Observation Performed:</i> 10/12
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 09/12

- 1 No further requirements.

8768094 Calcasieu Pass, East Jetty LA (PORTS)	L27553	Part 5
<i>PBM:</i> 876 8094 E (DJ9387)		<i>PBM above SD:</i> 9.9670 m
<i>GPS Bench Mark:</i> 876 8094 E TIDAL (DJ9387)		<i>MSL above SD:</i> 8.555 m
<i>GPS Observation Frequency:</i> Every year		<i>Last GPS Observation Performed:</i> 09/12
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 10/12

- 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.

2.12. Conrad Blucher Institute - Task 12-02: Pascagoula PORTS®
John Stepnowski, Task Manager/Technical Representative (TR)

The operations and maintenance responsibility for the stations listed under Task 12-02 Pascagoula PORTS® will be taken over by AOB after the funded time period is over as listed in Section 2.0

8741041 Pascagoula Dock E, MS (PORTS)	L27552	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: 04/12	
Dive Inspection Frequency: Every year		Last Dive: 04/12

- 1 No additional requirements

8741533 Pascagoula NOAA Lab, MS (PORTS)	L27552	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: 04/12	
Dive Inspection Frequency: Every year		Last Dive: 04/12

- 1 **FUNDING DEPENDENT:** Work with CBI and the Task Manager to provide an engineering design for the upgrade of this station to NWLON status. NWLON upgrade requirements: elevated frame to place DCPs above CAT 4 Storm Surge height, increase acoustic well length and add a full MET package (unless wind sensors are unfeasible). Present site is not compatible for the installation of wind sensors. JRS 11/10/11

2.13. Conrad Blucher Institute - Task 09-02 (13-01): Houston/Galveston PORTS®

Jim Lewis, Task Manager/Technical Representative (TR)

8770613 Morgan's Point, TX (PORTS)	L27554	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: 03/12

- 1 No additional requirements.

8771013 Eagle Point, TX (PORTS)	L27554	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: 03/12	
Dive Inspection Frequency: Every year		Last Dive: 04/10

- 1 **Unresolved from 2012 Project Instructions:** Measure the elevation of the wind and air temperature sensors above Met SRM.
- 2 Measure the elevation of the water temperature sensor above station datum.
- 3 Include bench marks EAGLE POINT 1932, EAGLE POINT NO 1 1932, and EAGLE POINT NO 2 1932 in level run.

8771341 Galveston Entr. Channel, TX (PORTS)	L27554	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: 05/12	
Dive Inspection Frequency: Every year		Last Dive: 05/12

- 1 Measure the water temperature sensor and barometer elevation above station datum.

8771450 Galveston Pier 21, TX (PORTS)	L27554	Part 2
PBM: 7.151 (AW0433)		PBM above SD: 2.856 m
GPS Bench Mark: 877 1450 B		MSL above SD: 1.588 m
GPS Observation Frequency: Every year	Last GPS Observation Performed: 11/10	
Dive Inspection Frequency: Every year		Last Dive: 11/07

- 1 Upgrade station according to the FERS approved design.
- 2 **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. Conrad Blucher Institute - Task 10-04: Texas Stations

Jim Lewis, Task Manager/Technical Representative (TR)

8770570 Sabine Pass North, TX (PORTS)

L27554

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.

8772447 USCG Freeport, TX

L27554

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 Measure the elevation of the wind and air temperature sensor above Met SRM.
- 2 Measure the elevation of the water temperature sensor and barometer above station datum.

8774770 Rockport, TX

L27554

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: 10/12

Dive Inspection Frequency: Every year

Last Dive: 10/12

- 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.

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

L27554

Part 6

PBM above SD: 9.098 m

MSL above SD: 6.635 m

Last GPS Observation Performed: 03/12

Last Dive: 03/10

- 1 **Unresolved from 2012 Project Instructions:** Recover and level bench mark 877 5870 F TIDAL.
- 2 **Unresolved from 2012 Project Instructions:** 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 **Unresolved from 2012 Project Instructions:** Measure the elevation of the wind and air temperature sensors above Met SRM.
- 4 **Unresolved from 2012 Project Instructions:** Measure the elevation of the barometer and the water temperature sensor above station datum.
- 5 **Unresolved from 2012 Project Instructions:** 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

L27554

Part 7

PBM above SD: 4.276 m

MSL above SD: 1.423 m

Last GPS Observation Performed: 10/12

Last Dive: 10/12

- 1 No further 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

L27564

Part 1

PBM Elevation (Dynamic): 84.6140 m

Hydraulic Corrector: +0.000 m

Last GPS Observation Performed: 06/10

Last Dive: 05/09

- 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

L27564

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

L27565

Part 1

PBM Elevation (Dynamic): 77.0712 m
Hydraulic Corrector: +0.008 m
Last GPS Observation Performed: 06/10
Last Dive: 06/09

- 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

L27565

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. Update bench mark diagram.

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

L27565

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

L27565

Part 4

PBM Elevation (Dynamic): 77.4920 m
Hydraulic Corrector: +0.008 m
Last GPS Observation Performed: 06/10
Last Dive: 05/09

- 1 Confirm bench marks 9052076 A, WL 125, WALL and CLINTON were searched for but not recovered. Update bench mark diagram.

2.15.3. Niagara River

9063007 Ashland Avenue, NY	L27566	Part 1
PBM: 906 3007 POOL (OG0229)	PBM Elevation (Dynamic): 111.4279 m	
GPS Bench Mark: N/A	Hydraulic Corrector: +0.000 m	
GPS Observation Frequency: (Waived – not feasible)	Last GPS Observation Performed: N/A	
Dive Inspection Frequency: Every year	Last Dive: 04/11	

- 1 Recover and provide face, setting, and two directional photos for bench mark N 27.

9063009 American Falls, NY	L27566	Part 2
PBM: 906 3009 FRONTIER (OG0223)	PBM Elevation (Dynamic): 171.8554 m	
GPS Bench Mark: W 411 (OG0350)	Hydraulic Corrector: +0.000 m	
GPS Observation Frequency: Every 5 years	Last GPS Observation Performed: Unknown	
Dive Inspection Frequency: Diving Not Allowed		

- 1 Include bench marks SMC 26, W 411 and BUFFALO AVENUE in the level run.

9063012 Niagara Intake, NY	L27566	Part 3
PBM: 906 3012 Y 411 (OG0352)	PBM Elevation (Dynamic): 174.4220 m	
GPS Bench Mark: 906 3012 RAIL (OG0217)	Hydraulic Corrector: +0.000 m	
GPS Observation Frequency: Every 5 years	Last GPS Observation Performed: 06/10	
Dive Inspection Frequency: Diving Not Allowed		

- 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. Update bench mark diagram.

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

L27566

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

L27566

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. Update bench mark diagram.
- 2 Measure the elevation of the air temperature sensor above Met SRM.
- 3 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

L27567

Part 3

PBM Elevation (Dynamic): 174.6781 m
Hydraulic Corrector: -0.025 m
Last GPS Observation Performed: 06/10
Last Dive: 06/10

- 1 No additional requirements.

9063053 Fairport, OH (MASTER)**L27567****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.
- 3 Install and maintain CORS station if/when provided by Morton Salt.

9063063 Cleveland, OH**L27567****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**L27567****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**PBM:** 906 3085 NAVAL (MC0269)**GPS Bench Mark:** 906 3085 G (AH9237)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L27567****Part 7****PBM Elevation (Dynamic):** 175.4592 m**Hydraulic Corrector:** -0.005 m**Last GPS Observation Performed:** 06/10**Last Dive:** 04/09

- 1 Include bench marks WL 105, POL 157.14 and STEEL PILE in the level run.
- 2 There are roof leaks, which need to be repaired.
- 3 Inside and outside of the building needs to be painted.

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**L27567****Part 8****PBM Elevation (Dynamic):** 177.5893 m**Hydraulic Corrector:** +0.023 m**Last GPS Observation Performed:** 06/10**Last Dive:** 04/09

- 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.
- 5 Level to NGS mark.

2.15.5. Detroit River

9044020 Gibraltar, MI

PBM: M 234 (NE0857)

GPS Bench Mark: H 115 X (NE0516)

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every 2 years

L27568

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

L27568

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

L27568

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

L27568

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 2013. 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

L27569 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	L27570	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: 11/11	

- 1 Ensure station aesthetics and landscaping are back to original condition per agreement.

9014080 St. Clair State Police, MI	L27570	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 Replace Xpert and BEI display units on wall.

9014087 Dry Dock, MI	L27570	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. Update bench mark diagram.

9014090 Mouth of the Black River, MI (NEW)	L27570	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. Update bench mark diagram.

9014096 Dunn Paper, MI

L27570

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: 11/11

- 1 The bulkhead area is subsiding possibly due to 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

L27570

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

L27571 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

L27571 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

L27571 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. Update bench mark diagram.

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

L27571 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

L27571

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.
- 2 Inside/outside ETG reading needed.
- 3 Determine outside intake invert elevation.

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

L27571

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

L27572

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.
- 4 Clean inside and outside of the gauge house from the old roof leaks. Fill holes in walls and install new door rubber.

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

L27572

Part 2

PBM Elevation (Dynamic): 177.5769 m

Hydraulic Corrector: +0.090 m

Last GPS Observation Performed: 07/10

Last Dive: 07/09

- 1 Determine outside intake invert elevation.

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

L27572

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.
- 4 Verify GOES antenna serial number.

9087057 Milwaukee, WI**PBM:** NAVY (OL0278)**GPS Bench Mark:** MILWAUKEE A (AA8061)**GPS Observation Frequency:** Every 5 years**Dive Inspection Frequency:** Every 2 years**L27572****Part 4****PBM Elevation (Dynamic):** 182.9494 m**Hydraulic Corrector:** +0.106 m**Last GPS Observation Performed:** 07/10**Last Dive:** 09/12

- 1 Gauge house needs interior and door painting plus general maintenance. Contact FOD for more information.
- 2 Regarding level run: note that United States Naval Reserve Center is closed on weekends.
- 3 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.
- 4 Coordinate internal video inspection for slip lined section of intake pipe.

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**L27572****Part 5****PBM Elevation (Dynamic):** 177.9684 m**Hydraulic Corrector:** +0.114 m**Last GPS Observation Performed:** 07/10**Last Dive:** 07/09

- 1 Station needs a new well pipe.
- 2 A replacement box and stand are needed for the BEI.

9087069 Kewaunee Met, WI Met 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**L27572****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**L27572****PBM Elevation (Dynamic):** 179.6563 m**Hydraulic Corrector:** +0.114 m**Last GPS Observation Performed:** 07/10**Last Dive:** 08/08**Part 7**

- 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**L27572****PBM Elevation (Dynamic):** 178.0211 m**Hydraulic Corrector:** +0.184 m**Last GPS Observation Performed:** 07/10**Last Dive:** 07/09**Part 9**

- 1 Include bench marks TURNING POINT 1, T 208, PILE, WALL and MARATHON in the level run.
- 2 Level to the Met SRM permanently established at the base of the Met tower.
- 3 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**L27572****PBM Elevation (Dynamic):** 181.3705 m**Hydraulic Corrector:** +0.046 m**Last GPS Observation Performed:** 07/10**Last Dive:** 08/10**Part 8**

- 1 Include bench mark 908 7096 H RESET 2001 in the level run.
- 2 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.
- 3 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. Update bench mark diagram.

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

L27573

Part 3

PBM Elevation (Dynamic): 178.0183 m

Hydraulic Corrector: 0.000 m

Last GPS Observation Performed: 06/10

Last Dive: 09/11

- 1 Inspect intake for possible clogging.
- 2 Station needs work on water level sensor wells.

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

L27573

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.

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

L27573

Part 5

PBM Elevation (Dynamic): 178.3058 m

Hydraulic Corrector: 0.000 m

Last GPS Observation Performed: 07/10

Last Dive: 09/10

- 1 No additional requirements.

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

L27573

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

L27573 **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 invert 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

L27574

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

L27574

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

L27574

Part 3

PBM Elevation (Dynamic): 186.0416 m

Hydraulic Corrector: +0.049 m

Last GPS Observation Performed: 07/10

Last Dive: 08/08

- 2 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. Update bench mark diagram.

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

L27574

Part 4

PBM Elevation (Dynamic): 184.7100 m

Hydraulic Corrector: +0.079 m

Last GPS Observation Performed: 07/10

Last Dive: 09/07

- 1 Verify the serial number, and if possible the installation date, of the barometer. There is a discrepancy between the 4-page site report and the database.

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

L27574

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. Update bench mark diagram.
- 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	L27562	Part 1
<i>PBM:</i> 161 1400 TIDAL 14		<i>PBM above SD:</i> 3.155 m
<i>GPS Bench Mark:</i> 161 1400 TIDAL 5		<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> 02/12

- 1 Re-install GOES antenna and cable at the water level station.
- 2 Replace/repair standalone Met station.
- 3 Replace the upper 6 inch well clamp.

1612340 Honolulu, HI	L27562	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 **Unresolved from the 2012 Project Instructions.** Replace all four ¾” brass bolts for the well flange.
- 2 Replace the concrete kick block and aluminum lid for bench mark 161 2340 A.

1612480 Mokuoloe, HI	L27562	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> 01/11

- 1 A dive inspection **MUST** be performed during this site visit; last dive was done in 01/11. A report on the condition of the marine growth on the outside of the well, around the plates, and inside the well is required on the Site report under the Dive comments.
- 2 **Unresolved from the 2012 Project Instructions.** Install new setup files on DCP3 to include logging to storage card.
- 3 Replace the 1/4" Nylock nuts (12) which support the mast structure, with non-nylock SS nuts.
- 4 Replace the air temperature housing.
- 5 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 wind tower.

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

L27562 **Part 4**
PBM above SD: 3.007 m
MSL above SD: 1.075 m
Last GPS Observation Performed: 01/08
Last Dive: 02/12

- 1 No additional requirements.

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

L27562 **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 A dive inspection **MUST** be performed during this site visit; last dive was done in (02/11). A report on the condition of marine growth on the outside of the well, around the plates, and inside the well is required on the Site Report under Dive comments.
- 2 Replace the protective well copper insert.
- 3 Replace the conduit for the backup bubbler tubing; work with the state of Hawaii for permission to perform this work).

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

L27562 **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 Establish the digibub leveling point and measure the elevation difference between the digibub leveling point and the digibub orifice zero.
- 2 Install 1/2" eyebolts for fall protection anchor near wind mast.
- 3 Provide updated handheld GPS positions for bench mark 161 7760 TIDAL 4.

1619910 Sand Island, Midway Islands
PBM: 161 9910 TIDAL 21
GPS Bench Mark: 161 9910 A
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27563

Part 1

PBM above SD: 3.243 m
MSL above SD: 1.020 m
Last GPS Observation Performed: 10/09
Last Dive: 10/11

- 1 Move the redundant station to the smallest pier inside the harbor, contingent on a new agreement.
- 2 Install an Iridium modem.
- 3 Replace T1 and T2 20 m cables with water tight connectors on one end (include mating connector separately.)
- 4 Replace padlock.
- 5 Include bench marks 1619910 C and 1619910 TIDAL 2 in the level run; these marks indicate possible movement.
- 6 Coordinate with the COASTAL Program Manager to determine whether any support is needed for a CORS installation.

1630000 Guam
PBM: 163 0000 TIDAL 6 (TW0043)
GPS Bench Mark: 163 0000 TIDAL 6 (TW0043)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27563

Part 2

PBM above SD: 2.364 m
MSL above SD: 0.826 m
Last GPS Observation Performed: 03/10
Last Dive: 03/12

- 1 Re-install the primary water level station (should be executed in conjunction with the Navy shoreline revitalization project).
- 2 Replace DCP3 Xpert to enable phone communications through COM3 (currently working by going through COM 8).
- 3 Replace/repair water temperature sensor on DCP3.
- 4 Replace the Shakespeare mast and 5 foot pole, if funding is available.
- 5 Establish and level three surface marks, designation/stamping as follows: 163 0000 S/000 S 2013; 163 0000 T/0000 T 2013; and 163 0000 U/0000 U 2013.
- 6 Update the bench mark diagram with the new mark.
- 7 Take face, setting, and location photos of any newly established marks.
- 8 Take setting and general location photos of all existing bench marks.

1631428 Pago Bay, Guam
PBM: 163 1428 B (DH3105)
GPS Bench Mark: 163 1428 1214 (DH2988)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27563

Part 3

PBM above SD: 10.000 m
MSL above SD: 7.740 m
Last GPS Observation Performed: 04/10
Last Dive: 09/11

- 1 **FUNDING DEPENDENT:** Replace/repair Paros pressure sensor on DCP1.
- 2 Replace the 40 amp-hr batteries for the Xpert Dark DCP and redundant pump.

1770000 Pago Pago**L27563****Part 4****PBM:** 177 0000 W**PBM above SD:** 4.345 m**GPS Bench Mark:** 177 0000 S (DE8786)**MSL above SD:** 1.194 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 12/09**Dive Inspection Frequency:** Every year**Last Dive:** 11/12

- 1 Establish the digibub leveling points for DCP 1, 2, 3, and 4 and measure the elevation difference between the digibub leveling point and digibub orifice zero.
- 2 Replace all DCP1 components.
- 3 Re-secure cable conduit using sheetrock anchors.
- 4 Install an air temperature sensor on DCP3.
- 5 Remove the wind sensor on DCP2 and re-install the wind sensor on DCP3.

1820000 Kwajalein**L27563****Part 5****PBM:** 182 0000 TIDAL 8 (DK7537)**PBM above SD:** 2.853 m**GPS Bench Mark:** 182 0000 TIDAL 12**MSL above SD:** 1.457 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 03/10**Dive Inspection Frequency:** Every year**Last Dive:** 10/10

- 1 A dive inspection **MUST** be performed during this site visit; last dive was done in (10/10). A report on the condition of marine growth on the outside of the well, around the plates and orifice, and inside the well is required on the Site Report under Dive comments.
- 2 Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
- 3 Replace the Aquatrak sensor, top hat fan, and the 30-ft cable.
- 4 Attach 10 small stainless steel conduit clamps on windbird flex conduit (3/4" or 1").
- 5 Attach 4 stainless steel conduit clamps on the Aquatrak conduit (1 1/2").
- 6 Patch bench marks with Quik-Crete, as needed.
- 7 Remove old clamps and old ADR well supports around tidehouse (tripping hazard).

1890000 Wake Island

PBM: 189 0000 TIDAL 12 (TW0169)

GPS Bench Mark: 161 0000 L

GPS Observation Frequency: Every 5 years

Dive Inspection Frequency: Every year

L27563

Part 6

PBM above SD: 4.353 m

MSL above SD: 1.608 m

Last GPS Observation Performed: 11/06

Last Dive: 11/10

- 1 A dive inspection **MUST** be performed during this site visit; last dive was done in (11/10). A report on the condition of marine growth on the outside of the well, around the plates and orifice, and inside the well is required on the Site Report under Dive comments.
- 2 Replace protective well copper insert in Aquatrak well.
- 3 Coordinate with the COASTAL Program Manager to determine whether any support is needed for a CORS recon.
- 4 Replace batteries for DCP 4, and the pump batteries for DCPs 2 and 4.

2.16.2 FOD/POB – California Stations

9410170 San Diego, CA **L27557** **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 whenever diving is performed.
- 2 Contact USS Midway and the City of San Diego for updates regarding plans to relocate the tide station and determine if an updated recon will be required.
- 3 Install additional surface mark near new station site when tide station is moved.

9410172 USS MIDWAY South Navy Pier, San Diego, CA **Met Only Station**
ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12

- 1 Confirm Xpert Display S/N.
- 2 Measure/verify the elevations of the wind and air temperature sensors above the Met SRM (suggest using the deck).
- 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.

9410660 Los Angeles (PORTS), CA **L27557** **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 Drop 941 0660 TIDAL 11 RESET and replace with additional surface mark. Update bench mark diagram reflecting new bench mark with designation/stamping of 941 0660 Q/0660 Q 2013.
- 3 Rebuild kick block around 941 0660 N TIDAL.

9410230 La Jolla, CA **L27557** **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 Level to Met SRM.
- 2 Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9410689 Long Beach Air Gap, CA (PORTS)
ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12

Air Gap Only Station

- 1 **NOTE:** Coordinate with AOB for trig levels support if levels are required.
- 2 Investigate upgrade to Air Gap with Laser.

9410840 Santa Monica, CA **L27557** **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:** 02/11

- 1 Plan one day of diving for marine growth removal.
- 2 Evaluate all piling clamps for future replacement.
- 3 **Unresolved from 2012 PI:** Take a setting photo of bench mark 941 0840 TIDAL 12
- 4 Level to Met SRM.
- 5 Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9411340 Santa Barbara, CA **L27557** **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 Investigate DCP 1 power issues. Station continues to blow 1 amp fuse.
- 2 Measure the elevation of the water temperature sensor above station datum.

9411406 TOPEX, CA **L27557** **Part 19**
PBM: 941 1406 NO STAMPING (+20 LEG 1992) **PBM above SD:** 20.150 m
GPS Bench Mark: N/A **MSL above SD:** 14.467 m
GPS Observation Frequency: Not required. **Last GPS Observation Performed:** N/A
Dive Inspection Frequency: Every year **Last Dive:** 09/11

ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12

- 1 **NOTE: Use of optical levels at this station is authorized.** There is a permanent GPS unit on site maintained by JPL and connected by FOB leveling to the water level sensor.
- 2 **NOTE: Dive inspection by CO-OPS is not permitted.** Diving is performed by TOPEX contractors and is paid for by JPL.
- 3 Check the GOES antenna for corrosion; ship one additional replacement flat plane next visit.
- 4 Bring wireless testing kit and two IP Modems to install next visit if a wireless signal can be found.
- 5 Plumb new orifice.

9412110 Port San Luis, CA **L27557** **Part 5**
PBM: 941 2110 TIDAL 6 (FV0898) **PBM above SD:** 5.691 m
GPS Bench Mark: 941 2110 TIDAL 6 (FV0898) **MSL above SD:** 2.149 m
GPS Observation Frequency: Every 5 years **Last GPS Observation Performed:** 02/11
Dive Inspection Frequency: Every year **Last Dive:** 03/11

- 1 Take setting photos of bench marks 941 2110 TIDAL 6 and 941 2110 E.
- 2 Provide a description and photo of the Met SRM and include the Met SRM in the leveling run.

9413450 Monterey, CA **L27557** **Part 6**
PBM: 941 3450 TIDAL 2 (GU2090) **PBM above SD:** 5.669 m
GPS Bench Mark: 941 3450 M TIDAL (GU4116) **MSL above SD:** 1.893 m
GPS Observation Frequency: Every 5 years **Last GPS Observation Performed:** 02/11
Dive Inspection Frequency: Every year **Last Dive:** 12/11

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

9414290 San Francisco, CA (PORTS) **L27557** **Part 7**
PBM: 941 4290 TIDAL 180 (HT0702) **PBM above SD:** 5.794 m
GPS Bench Mark: 941 4290 TIDAL 180 (HT0702) **MSL above SD:** 2.773 m
GPS Observation Frequency: Every 5 years **Last GPS Observation Performed:** 08/10
Dive Inspection Frequency: Every year **Last Dive:** 10/12

- 1 Replace wind bird wire.
- 2 Bring replacement Swagelok fitting for backup orifice in case of extreme corrosion.

9414523 Redwood City, CA (PORTS) **L27557** **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:** 10/12

- 1 Replace T1 and T2 sensors (black side on sounding tube only) due to deteriorating insulation on wires.

9414750 Alameda, CA (PORTS) **L27557** **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:** 10/12

- 1 Monitor MHHW clamp, fiberglass coated timbers, steel piling attachments, and bubbler conduit clamps annually and evaluate for future replacement with plastic timbers.
- 2 Bring replacement Swagelok fitting for backup orifice in case of extreme corrosion.

9414863 Richmond, CA (PORTS)
PBM: TIDAL 3 STA III 23 (HT0940)
GPS Bench Mark: 941 4863 M
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27557

Part 10

PBM above SD: 6.376 m
MSL above SD: 4.520 m
Last GPS Observation Performed: 10/09
Last Dive: 10/12

- 1 **Unresolved from 2011 PI:** Take one directional photo of 941 4863 E.
- 2 **Unresolved from 2012 PI:** Install a new bench mark with designation/stamping 941 4863 P/4863 P 2013 to replace the destroyed bench mark TIDAL 1 STA III 23.
- 3 Bring replacement Swagelok fitting for backup orifice in case of extreme corrosion.
- 4 Replace battery in pump power box.

9414958 Bolinas Lagoon, CA (COASTAL)
PBM: 941 4958 F
GPS Bench Mark: 941 4958 F
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27557

Part 17

PBM above SD: 4.823 m
MSL above SD: 1.437 m
Last GPS Observation Performed: 06/09
Last Dive: 08/11

ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12

- 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 2013 to bring network to a total of five bench marks.
- 4 Anchor end of fiberglass board to weight the end. Heavy erosion has occurred and the board needs to be supported.

9415020 Point Reyes, CA
PBM: B 243 (HT1839)
GPS Bench Mark: 941 5020 Q TIDAL (HT3505)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27557

Part 11

PBM above SD: 4.977 m
MSL above SD: 2.152 m
Last GPS Observation Performed: 10/10
Last Dive: 12/11

ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12

- 1 **Unresolved from 2011 PI:** Remove the derelict ADR and ETG wells.
- 2 Repair/replace the kick block for bench mark 941 5020 J.
- 3 Level to Met SRM.

9415102 Martinez Amorco Pier, CA (PORTS)

Met Only Station

ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12

- 1 Install a new water level station as approved by FERS; POB will coordinate details with the task manager, PORTS manager, and ED.
- 2 Measure the elevation of the air temp sensor above Met SRM.
- 3 Measure the elevation of the barometric pressure sensor above station datum.
- 4 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.
- 5 Take station photos showing the met sensors.

9415144 Port Chicago, CA (PORTS)

L27557

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

ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12

- 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.
- 4 Perform recon for future MWWL sensor upgrade.

9416841 Arena Cove, CA

L27557

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 Bring new light bulbs for the tide house.
- 2 Level to the Met SRM.

9418767 North Spit, CA

L27557

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 Measure the elevations of the wind and air temperature sensors above the Met SRM (base of tower).
- 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 Change kick blocks for (3) of the deep rod marks to accommodate the invar rods.

9419750 Crescent City, CA

L27557

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: 12/11

- 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 **L27558** **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:* 10/12
Maintenance performed in late CY12 will count towards CY13 inspection requirement.

- 1 Inspect B1 orifice for corrosion and replace if necessary.

9432780 Charleston, OR **L27558** **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:* 03/12

- 1 Move Air Temp to MET station.
- 2 Measure the elevations of the wind & air temp sensors above Met SRM.
- 3 Provide photographs and description of Met SRM, wind and air temp sensors.
- 4 Level to Met SRM.
- 5 **Unresolved from 2012 PI:** Take setting photo of bench mark 941 2780 TIDAL 10 and submit to COET.

9435380 South Beach, OR **L27558** **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:* 03/12

- 1 **Unresolved from 2011 PI:** 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**L27558****Part 5****PBM above SD:** 5.827 m**MSL above SD:** 2.577 m**Last GPS Observation Performed:** 07/11**Last Dive:** 03/12

- 1 **Unresolved from 2011 PI:** Take setting photos of bench marks 943 7540 TIDAL B and 943 7540 D.
- 2 Remove old GPS antenna from Met station (exterior wall) if GPS sync remains consistent during the year.
- 3 Remove old radio antenna from USCG boathouse during remodel.
- 4 Install temporary IP modem and antenna during remodel.
- 5 Determine the elevation of Met SRM for winds above water level and note the date/time of the observation in the site report.
- 6 Relocate Air Temp sensor to Met station & measure new elevation above Met SRM. Sensor is currently located beneath the pier.

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**L27558****Part 8****PBM above SD:** 6.190 m**MSL above SD:** 2.135 m**Last GPS Observation Performed:** 08/11**Last Dive:** 08/12

- 1 Establish a phone line.
- 2 Install 5" kick block for bench mark C.
- 3 Bring pump to remove silt from around buried orifices.
- 4 Replace existing primary sensor with the approved MWWL sensor and if any structural modifications, seek Field Engineering Review Subcommittee (FERS) approval.

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**L27558****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 Maintain all the meteorological sensors installed as the funding is received from NOS CSC Coastal Storms Program in FY 12.
- 2 Power wash the deck area around the tide house.

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

- 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

- 1 No additional requirements

L27558 **Part 6**
PBM above CRD: 4.481 m
MSL above SD: 1.332 m
Last GPS Observation Performed: 08/09
Last Dive: 08/12

L27558 **Part 7**
PBM above CRD: 20.534 m
MSL above SD: 1.047 m
Last GPS Observation Performed: 08/09
Last Dive: 08/12

2.16.4 FOD/POB – Washington Stations

9440083 Vancouver, WA (PORTS)	L27559	Part 11
<i>PBM:</i> 944 0083 D		<i>PBM above CRD:</i> 9.470 m
<i>GPS Bench Mark:</i> 944 0083 F		<i>MSL above SD:</i> 0.940 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> 08/12

- 1 No additional requirements.

9440422 Longview, WA (PORTS)	L27559	Part 12
<i>PBM:</i> 944 0422 E		<i>PBM above CRD:</i> 8.949 m
<i>GPS Bench Mark:</i> 944 0422 TIDAL 5 (SC1112)		<i>MSL above SD:</i> 1.385 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> 08/12

- 1 **Unresolved from 2012 PI:** Contact Norm Krehbiel regarding availability of funds for future relocation of tide house. Port of Longview Engineers - 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)	L27559	Part 13
<i>PBM:</i> N 317 (SC0338)		<i>PBM above CRD:</i> 7.232 m
<i>GPS Bench Mark:</i> 944 0569 C		<i>MSL above SD:</i> 1.269 m
<i>GPS Observation Frequency:</i> Every 5 years		<i>Last GPS Observation Performed:</i> 09/10
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 08/12

- 1 **Unresolved from 2009 PI:** Raise the tide house three feet with plastic timbers, placing the tide house above the waterline; contingent upon Port of Portland funding; seek Field Engineering Review Subcommittee (FERS) approval.
- 2 Evaluate and photograph site for future MWWL installation contingent on Port of Portland funding; seek Field Engineering Review Subcommittee (FERS) approval.

9440910 Toke Point, WA**L27559****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:** 04/12

- 1 **Unresolved from 2012 PI:** Add 5 inch PVC and lid with concrete kick block for bench mark 944 0910 K.
- 2 **Unresolved from 2012 PI:** Verify the barometer serial #.
- 3 Bench Mark 944 0910 R was dropped from the network in 2012. Destroy this mark or confirm that it was previously destroyed. Update bench mark diagram.
- 4 Install new surface mark 944 0910 T.
- 5 Install new LP for backup Paros.
- 6 Replace existing primary sensor with the approved MWWL sensor and if any structural modifications, seek Field Engineering Review Subcommittee (FERS) approval.
- 7 Measure the elevations of the wind & air temp sensors above Met SRM.
- 8 Provide a description & photo of Met SRM and perform tape down measurement to water level. Include the date/time of this measurement in the site report.
- 9 Level to Met SRM.

9441102 Westport, WA**L27559****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**ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12**

- 1 Measure the elevation of the air temp sensor above Met SRM

9442396 La Push, WA**L27559****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**ANNUAL INSPECTION WAS NOT PERFORMED DURING CY12**

- 1 Replace Pump for redundant DCP (motor to pump coupling is failing).
- 2 Ground Paros enclosures with 12 gauge solid ground wire.
- 3 Evaluate and photograph for future MWWL installation contingent on available funding; seek Field Engineering Review Subcommittee (FERS) approval.

9443090 Neah Bay, WA	L27559	Part 4
<i>PBM:</i> 944 3090 TIDAL 19 (TS0161)		<i>PBM above SD:</i> 6.507 m
<i>GPS Bench Mark:</i> 944 3090 TIDAL 19 (TS0161)		<i>MSL above SD:</i> 1.925 m
<i>GPS Observation Frequency:</i> Every 5	<i>Last GPS Observation Performed:</i> 06/11	
<i>Dive Inspection Frequency:</i> Every year		<i>Last Dive:</i> 05/12

- 1 No additional requirements.

9444090 Port Angeles, WA	L27559	Part 5
<i>PBM:</i> L 467 (TR0790)		<i>PBM above SD:</i> 14.475 m
<i>GPS Bench Mark:</i> L 467 (TR0790)		<i>MSL above SD:</i> 10.534 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 08/11	
<i>Dive Inspection Frequency:</i> Every 2 years		<i>Last Dive:</i> 06/12

- 1 Replace kick blocks on bench marks 944 4090 A & 944 4090 C.
- 2 Replace cover on bench mark 944 4090 B.

9444900 Port Townsend, WA	L27559	Part 6
<i>PBM:</i> 944 4900 BM 18		<i>PBM above SD:</i> 6.559 m
<i>GPS Bench Mark:</i> 944 4900 D TIDAL (AI2202)		<i>MSL above SD:</i> 2.547 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 08/11	
<i>Dive Inspection Frequency:</i> Every 2 years		<i>Last Dive:</i> 06/12

- 1 Level to both the Aquatrak and MWWL sensors in support of ongoing sensor comparison study.

9446484 Tacoma, WA (PORTS)	L27559	Part 7
<i>PBM:</i> 944 6484 A		<i>PBM above SD:</i> 5.326 m
<i>GPS Bench Mark:</i> 944 6484 B		<i>MSL above SD:</i> 2.269 m
<i>GPS Observation Frequency:</i> Every 5 years	<i>Last GPS Observation Performed:</i> 04/10	
<i>Dive Inspection Frequency:</i> N/A		<i>Last Dive:</i> 04/10

- 1 **NOTE:** Dive inspection by CO-OPS is not permitted.
- 2 Evaluate and photograph site for future MWWL installation contingent on Port of Tacoma funding; seek Field Engineering Review Subcommittee (FERS) approval.

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

L27559 **Part 8**
PBM above SD: 8.851 m
MSL above SD: 4.443 m
Last GPS Observation Performed: 03/07
Last Dive: 04/12

- 1 No additional requirements

9449424 Cherry Point, WA (PORTS)
PBM: 944 9424 TIDAL 1
GPS Bench Mark: 941 9424 J TIDAL (AI2204)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27559 **Part 9**
PBM above SD: 11.226 m
MSL above SD: 3.543 m
Last GPS Observation Performed: 04/11
Last Dive: 05/11

- 1 Replace rusty cotter pins on SS Met mast break over plate with new SS pins.

9449419 Cherry Point at South Dock, WA (PORTS)

Met Only Station

- 1 No additional requirements

9449880 Friday Harbor, WA
PBM: 944 9880 TIDAL 10
GPS Bench Mark: 944 9880 C TIDAL (AI2205)
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every year

L27559 **Part 10**
PBM above SD: 4.892 m
MSL above SD: 2.561 m
Last GPS Observation Performed: 08/11
Last Dive: 08/12

- 1 Replace 40W solar panel for DCP 2.

2.16.5 FOD/POB – Alaska Stations

9450460 Ketchikan, AK **L27561** **Part 1**
PBM: 945 0460 TIDAL 24 *PBM above SD:* 8.946 m
GPS Bench Mark: 945 0460 TIDAL 37 *MSL above SD:* 4.345 m
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed:* 07/11
Dive Inspection Frequency: Every year *Last Dive:* 07/12

- 1 Install a metal witness post marking bench mark 9450460 E.
- 2 Replace the solar panel array, if necessary.
- 3 Re-measure the elevation of the wind sensor above the Met SRM.

9451054 Port Alexander, AK **L27561** **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 A dive inspection MUST be performed during this site visit; last dive was done in (06/11). A report on the condition of marine growth around the plates and orifice is required on the Site Report under Dive comments.
- 2 Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
- 3 Replace the upper foot on Xpert Dark DCP, including brass sleeve insert.
- 4 Review and correct, if necessary, the setup file for Xpert Dark DCP ensuring all backup water level data are being averaged appropriately.

9451600 Sitka, AK **L27561** **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 Replace combination lock.
- 2 Replace phone switch.
- 3 Provide a photo of the Met SRM.
- 4 Establish and level one surface mark, designation/stamping as follows: 945 1600 U/1600 U 2013.

9452210 Juneau, AK

L27561

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: 07/12

Dive Inspection Frequency: Every year

Last Dive: 07/12

- 1 Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
- 2 Inspect orifice fittings annually for corrosion.
- 3 Install new access cap on orifice stop.

9452400 Skagway, AK

L27561

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: 07/12

Dive Inspection Frequency: Every year

Last Dive: 07/11

- 1 Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
- 2 A dive inspection **MUST** be performed during this site visit; last dive was done in (07/11). A report on the condition of marine growth on the outside of the well, around the plates and orifice, and inside the well is required on the Site Report under Dive comments.
- 3 Replace the GOES antenna.
- 4 **Unresolved from 2012 Project Instructions.** Install two new stainless steel bandits to both the primary and backup orifice conduits.
- 5 Replace the GOES antenna and coax.
- 6 Destroy bench mark 9452400 J.
- 7 Include the bench mark at the top of the boat ramp in the small boat harbor in this year's level run; also provide a description for the bench mark.
- 8 Install metal witness signs in bedrock above bench marks 945 2400 TIDAL 11, 945 2400 TIDAL 8, and 945 2400 G.

9452634 Elfin Cove, AK**L27561****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 Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
- 2 A dive inspection **MUST** be performed during this site visit; last dive was done in (07/11). A report on the condition of marine growth around the plates and orifice is required on the Site Report under Dive comments.
- 3 Install a new lower (DCP 1) orifice.
- 4 Install new air temperature sensor on the primary solar panel pole.
- 5 Install doors to protect gauges.
- 6 Install a witness post near bench mark 945 2634 G.
- 7 Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met team suggest the base of the mounting structure.
- 8 Measure the air temperature sensor above Met SRM and the barometric pressure sensor above station datum.

9453220 Yakutat, AK**L27561****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 A dive inspection **MUST** be performed during this site visit; last dive was done in (05/11). A report on the condition of marine growth on the outside of the well and inside the well is required on the Site Report under Dive comments.
- 2 Perform a recon for future MWWL sensor upgrade.

9454050 Cordova, AK**L27561****Part 8****PBM:** 945 4050 S**PBM above SD:** 10.178 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 A dive inspection **MUST** be performed during this site visit; last dive was done in (05/11). A report on the condition of marine growth on the outside of the well and inside the well is required on the Site Report under Dive comments.
- 2 Establish and level one surface mark and preferably two 3D rod marks (or marks set in bedrock), designation/stamping as follows: 945 4050 Z/4050 Z 2013; 945 4050 AA/4050 AA 2013; and 945 4050 BB/4050 BB 2013.

9454240 Valdez, AK
PBM: 945 4240 TIDAL 21
GPS Bench Mark: 945 4240 T
GPS Observation Frequency: Every 5 years
Dive Inspection Frequency: Every 2 years

L27561 **Part 9**
PBM above SD: 8.327 m
MSL above SD: 4.035 m
Last GPS Observation Performed: 07/11
Last Dive: 07/11

- 1 No additional requirements.

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

L27561 **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 A dive inspection **MUST** be performed during this site visit; last dive was done in (05/11). A report on the condition of marine growth on the outside of the well and inside the well is required on the Site Report under Dive comments.
- 2 Repair the cement around bench mark 945 5090 J on the pier.

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

L27561 **Part 11**
PBM above SD: 11.272 m
MSL above SD: 5.080 m
Last GPS Observation Performed: 06/11
Last Dive: 05/12

- 1 No additional requirement.

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

L27561 **Part 12**
PBM above SD: 14.850 m
MSL above SD: 5.541 m
Last GPS Observation Performed: 06/11

- 1 Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
- 2 Reposition GOES & GPS antennas, if necessary.
- 3 Take digital photos of the Met SRM (may need to receive permission prior to visit).
- 4 Measure the elevation of the water temperature sensor above station datum.

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

L27561 **Part 13**
PBM above SD: 13.231 m
MSL above SD: 6.931 m
Last GPS Observation Performed: 05/12

- 1 Measure the elevation of the water temperature sensor above station datum.

9457292 Kodiak, AK
PBM: 945 7292 B
GPS Bench Mark: 945 7292 TIDAL 16
GPS Observation Frequency: Every year
Dive Inspection Frequency: Every 2 years

L27561 **Part 14**
PBM above SD: 14.124 m
MSL above SD: 9.160 m
Last GPS Observation Performed: 07/12
Last Dive: 07/11

- 1 Replace Satlink 1 with Satlink 2.

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

L27561 **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 Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
- 2 A dive inspection **MUST** be performed during this site visit; last dive was done in (07/11). A report on the condition of marine growth around the plates and orifice is required on the Site Report under Dive comments.

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

L27561 **Part 26**
PBM above SD: 16.389 m
MSL above SD: 11.018 m
Last GPS Observation Performed: 07/11

- 1 Provide a description and photo of the Met SRM and include the Met SRM in the leveling run. The Met team suggests establishing the Met SRM at the base of the building that houses the DCPs.
- 2 **Unresolved from 2012 Project Instructions:** Take setting photos and one general location of all existing bench marks.
- 2 Include bench marks 949 7645 Windsock, 949 7645 NW Bridge, and 949 7645 BM NE Bridge in the level run; these marks were not leveled last year.

2.17. JOA - Task 12-08: Western Alaska Stations

Drew Maczko, Task Manager/Technical Representative (TR)

9459450 Sand Point, AK

L27561

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: 06/12

- 1 **Unresolved from 2012 Project Instructions.** Leave a protective well copper insert (GFE) in the tide house for the bottom of the Aquatrak well.
- 2 Replace the Xpert DCP battery.
- 3 Install a weather head on Met mast.

9459881 King Cove, AK

L27561

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 A dive inspection MUST be performed during this site visit; last dive was done in (05/11). A report on the condition of marine growth around the plates and orifice is required on the Site Report under Dive comments.
- 2 Inspect and repair (if necessary) the concrete block supporting the wind tower.

9461380 Adak, AK

L27561

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 A dive inspection MUST be performed during this site visit; last dive was done in (07/11). A report on the condition of marine growth around the plates and orifice is required on the Site Report under Dive comments.
- 2 Install approved MWWL sensor on DCP 5, if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.

9461710 Atka, Nazan Bay, AK**L27561****Part 19****PBM:** 946 1710 B**PBM above SD:** 15.000 m**GPS Bench Mark:** 946 1710 G**MSL above SD:** 8.804 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 08/11**Dive Inspection Frequency:** Every year**Last Dive:** 08/11

- 1 Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
- 2 A dive inspection MUST be performed during this site visit; last dive was done in (08/11). A report on the condition of marine growth around the plates and orifice is required on the Site Report under Dive comments.
- 3 Install a new Paros box, with Paros sensor (GFE), for the backup gauge.
- 4 Install a new padlock.

9462450 Nikolski, Mueller Cove, AK**L27561****Part 20****PBM:** 945 2450 F**PBM above SD:** 7.782 m**GPS Bench Mark:** 945 2450 ASTRO**MSL above SD:** 1.936 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 08/11**Dive Inspection Frequency:** Every year**Last Dive:** 08/11

- 1 Verify the elevation difference between the digibub leveling point and the digibub orifice zero on an annual basis.
- 2 A dive inspection MUST be performed during this site visit; last dive was done in (08/11). A report on the condition of marine growth around the plates and orifice is required on the Site Report under Dive comments.
- 3 Install a 3 foot section of orifice tubing.
- 4 Replace the Swagelok lock fittings on the backup orifice.
- 5 Update the Xpert DCP setup files removing Paros 2 and com 7.

9462620 Unalaska, AK**L27561****Part 21****PBM:** 946 2620 TIDAL 7**PBM above SD:** 3.597 m**GPS Bench Mark:** 946 2620 TIDAL 19**MSL above SD:** 1.427 m**GPS Observation Frequency:** Every 5 years**Last GPS Observation Performed:** 08/11**Dive Inspection Frequency:** Every year**Last Dive:** 08/12

- 1 Install approved MWWL sensor on DCP 5, if any structural modifications are required seek engineering support and Field Engineering Review Subcommittee (FERS) approval.
- 2 Contact TelAlaska (907.581.1399) and initiate a work request to fix the phone line.

9463502 Port Moller, AK **L27561** **Part 22**
PBM: 946 3502 B *PBM above SD: 15.422 m*
GPS Bench Mark: 946 3502 H *MSL above SD: 10.683 m*
GPS Observation Frequency: Every 5 years *Last GPS Observation Performed: 09/11*
Dive Inspection Frequency: Every year *Last Dive: 09/11*

- 1 No additional requirements.

9464212 Village Cove, AK **L27561** **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 leveling point and the digibub orifice 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 **L27561** **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 Repair DCP2, if necessary.

9491094 Red Dog, AK **L27561** **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 leveling point and the digibub orifice zero on an annual basis.
- 2 Measure the elevations of the water temperature sensor above station datum.