CO-OPS Coastal Water Level Stations Requirements for Documentation and Deliverables

September 2016

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

Center for Operational Oceanographic Products and Services

FOREWORD

The Center for Operational Oceanographic Products and Services (CO-OPS) provides the national infrastructure, science, and technical expertise to collect and distribute observations and predictions of water levels and currents to ensure safe, efficient, and environmentally sound maritime commerce. CO-OPS provides the set of water level and tidal current products required to support NOAA and to assist in providing operational oceanographic data and products required by other groups and Strategic Plans within NOAA.

Data submission requirements for CO-OPS water level observing stations are comprised of the observed water level data and the supporting metadata and documents for station installation, site visits for scheduled and unscheduled maintenance, and station removal. Observed water level data are formatted such that the CO-OPS can ingest the data observing system. This manual outlines data and metadata documentation submission requirements (i.e., 'deliverables') and gives examples of each, to assist field personnel when submitting to CO-OPS. The content in this manual was derived from the *CO-OPS Specifications and Deliverables for Installation, Operation, and Removal of Water Level Stations* (Station Documentation; Section 5.3). These required data submissions should be submitted in digital format only.

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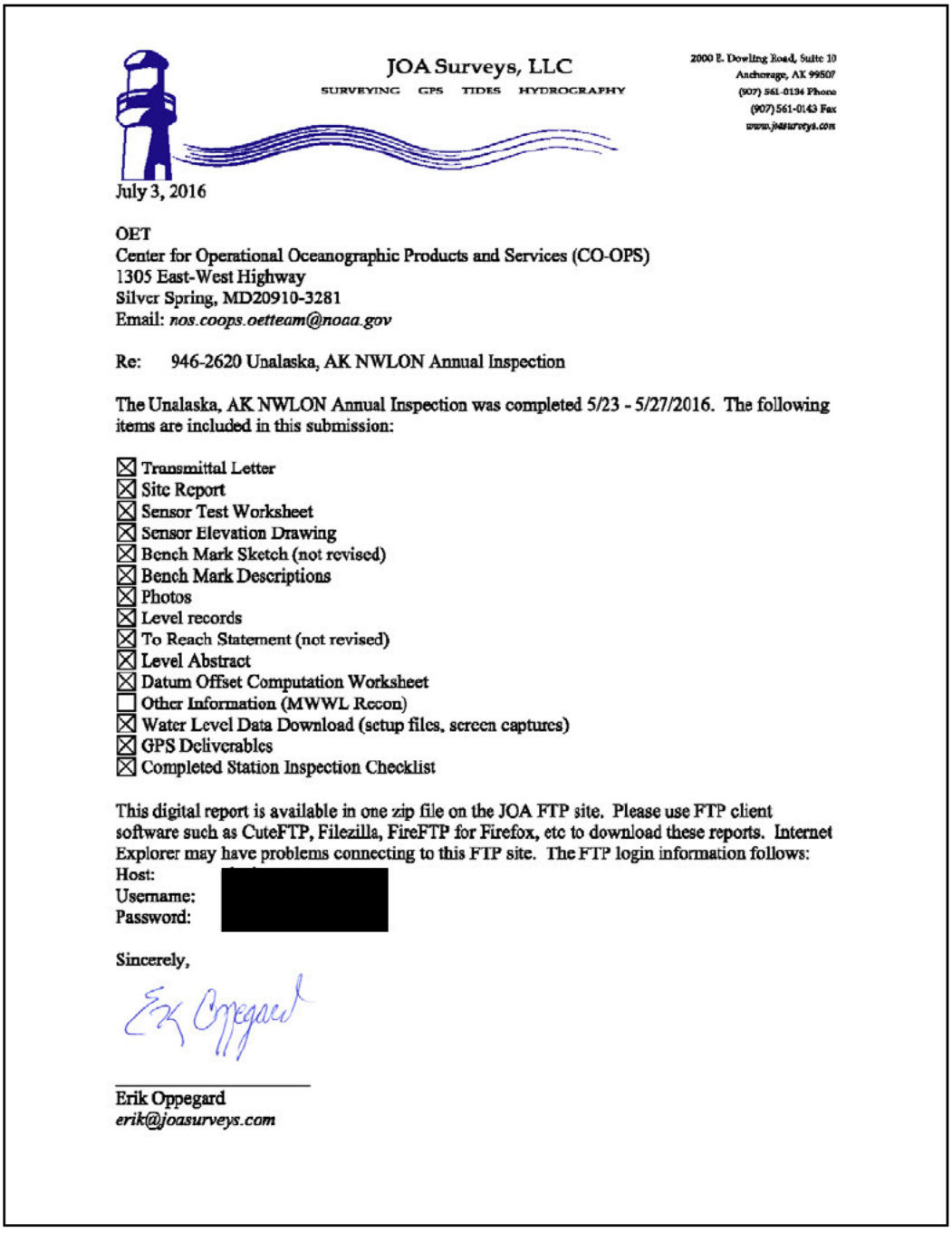
1.0 Transmittal Letter

The transmittal letter gives general information about the installation, maintenance, and repair of particular water level observing station. It briefly details what has been included in the station documentation package (e.g., new work orders), dates of when any actions were taken, and the parties involved (e.g., CO-OPS and U.S. Army Corps of Engineers). The transmittal letter also provides notifications of where any copies of these updates to the station documentation have been sent.
Example of an external transmittal letter:



JOA Surveys, LLC
SURVEYING GPS TIDES HYDROGRAPHY

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Anchorage, AK 99507
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(907) 561-0143 Fax
www.joasurveys.com

July 3, 2016

OET
Center for Operational Oceanographic Products and Services (CO-OPS)
1305 East-West Highway
Silver Spring, MD20910-3281
Email: *nos.coops.oetteam@noaa.gov*

Re: 946-2620 Unalaska, AK NWLON Annual Inspection

The Unalaska, AK NWLON Annual Inspection was completed 5/23 - 5/27/2016. The following items are included in this submission:

- ☒ Transmittal Letter
- ☒ Site Report
- ☒ Sensor Test Worksheet
- ☒ Sensor Elevation Drawing
- ☒ Bench Mark Sketch (not revised)
- ☒ Bench Mark Descriptions
- ☒ Photos
- ☒ Level records
- ☒ To Reach Statement (not revised)
- ☒ Level Abstract
- ☒ Datum Offset Computation Worksheet
- ☐ Other Information (MWWL Recon)
- ☒ Water Level Data Download (setup files, screen captures)
- ☒ GPS Deliverables
- ☒ Completed Station Inspection Checklist

This digital report is available in one zip file on the JOA FTP site. Please use FTP client software such as CuteFTP, Filezilla, FireFTP for Firefox, etc to download these reports. Internet Explorer may have problems connecting to this FTP site. The FTP login information follows:
Host:
Username:
Password:

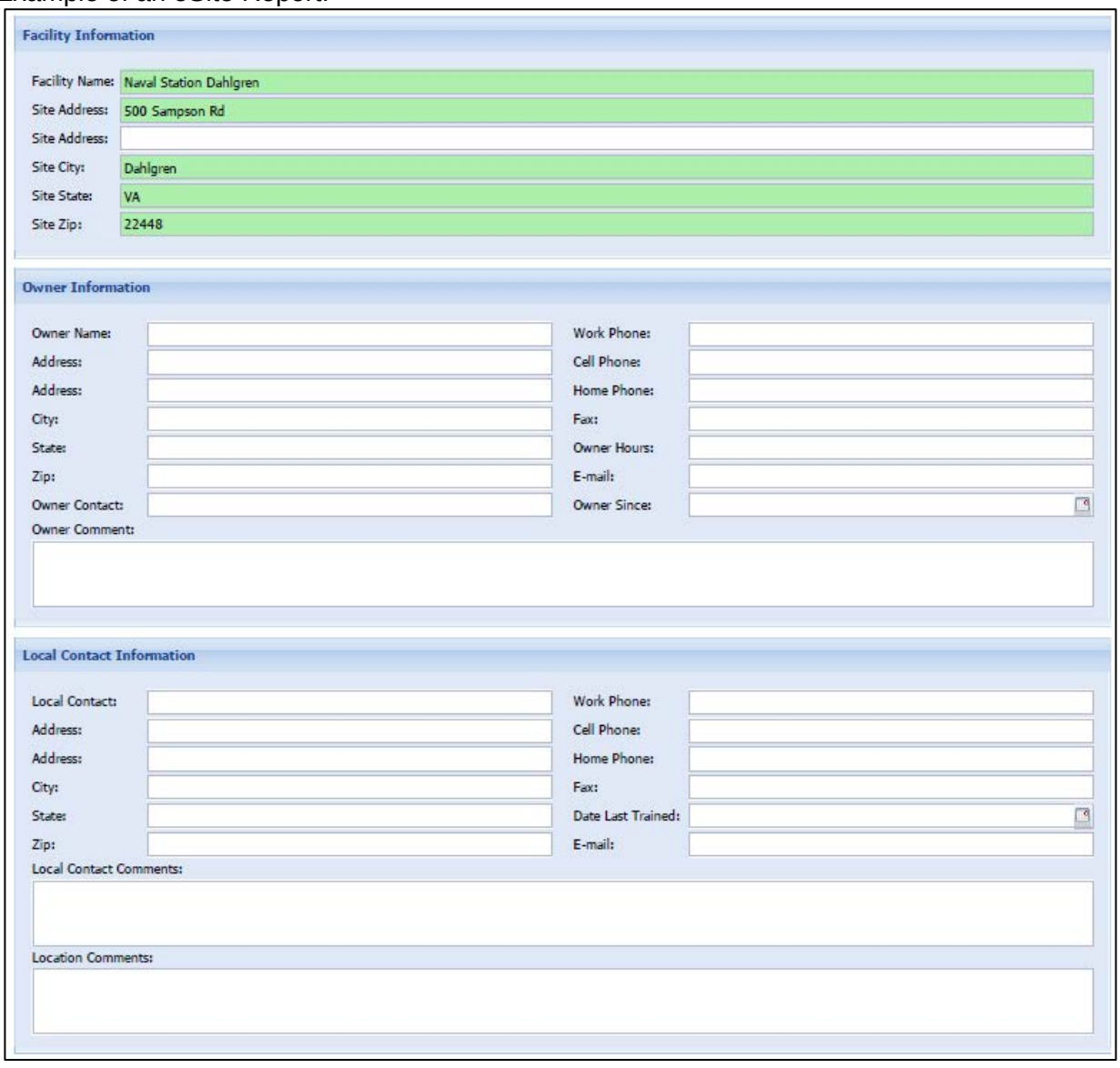
Sincerely,

Erik Oppegard
erik@joasurveys.com

2.0 eSite Report

The eSite report is a web-based interface through which station and instrumentation metadata for water level and meteorological observing systems can be entered, submitted, verified and recorded. Through the CO-OPS Application Access Management (AAM) tool, CO-OPS employees and contractors can be granted access to the eSite report interface, so that field maintenance metadata is submitted to CO-OPS in a standardized manner. eSite reports are documents specifying updated information describing the site, local contacts and site specific logistical considerations, as well as sensor, equipment, infrastructure and bench mark metadata. Users are able to modify the metadata describing parts and accessories, remove parts and accessories, or add new or undocumented parts and accessories. These reports can also include event-driven information such as dive inspections, GPS observations, and sensor and bench mark leveling.

Example of an eSite Report:



Facility Information

Facility Name:	Naval Station Dahlgren
Site Address:	500 Sampson Rd
Site Address:	
Site City:	Dahlgren
Site State:	VA
Site Zip:	22448

Owner Information

Owner Name:		Work Phone:	
Address:		Cell Phone:	
Address:		Home Phone:	
City:		Fax:	
State:		Owner Hours:	
Zip:		E-mail:	
Owner Contact:		Owner Since:	

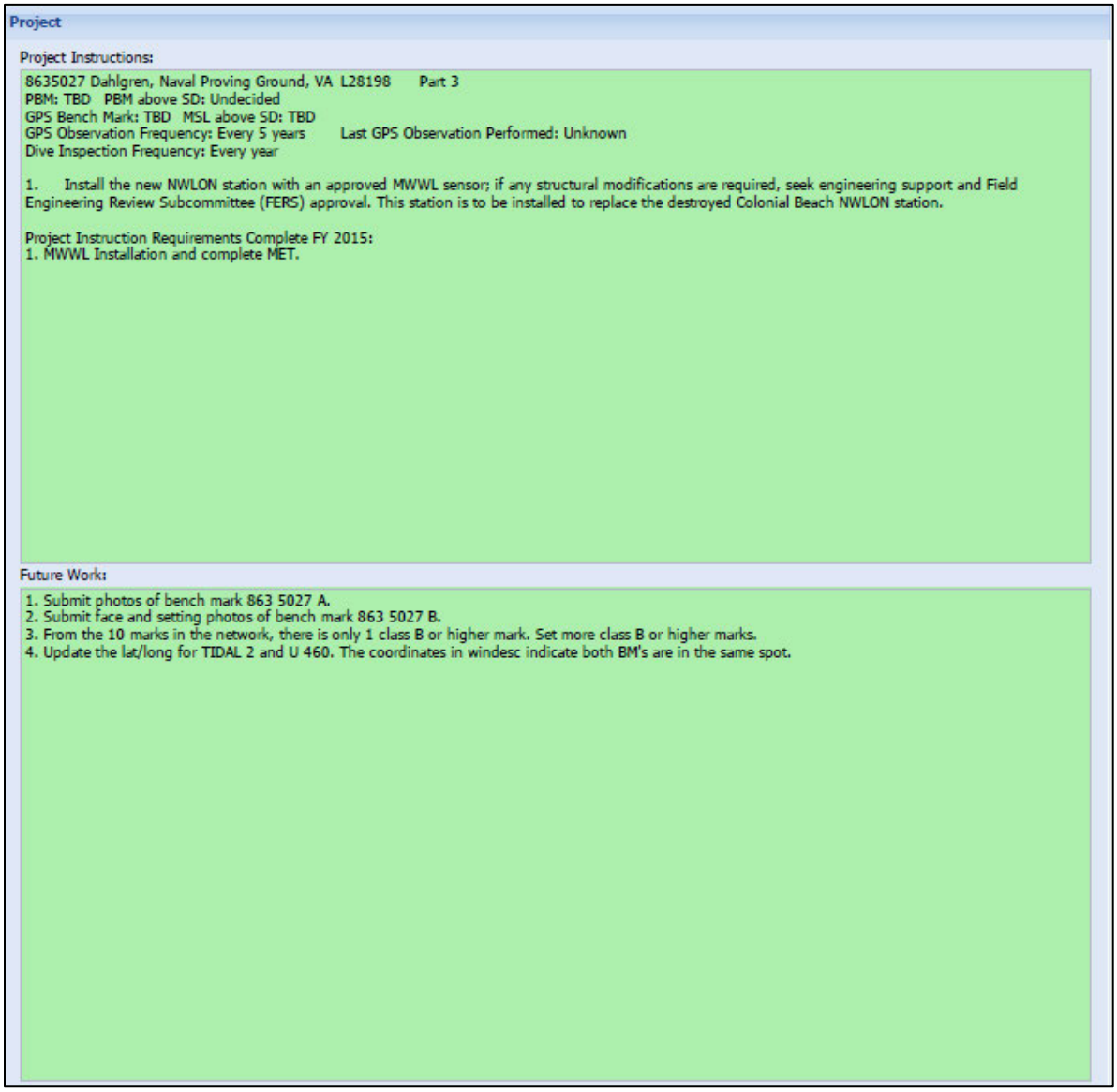
Owner Comment:

Local Contact Information

Local Contact:		Work Phone:	
Address:		Cell Phone:	
Address:		Home Phone:	
City:		Fax:	
State:		Date Last Trained:	
Zip:		E-mail:	

Local Contact Comments:

Location Comments:


Project
Project Instructions:
8635027 Dahlgren, Naval Proving Ground, VA L28198 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 with an approved MWWL sensor; if any structural modifications are required, seek engineering support and Field Engineering Review Subcommittee (FERS) approval. This station is to be installed to replace the destroyed Colonial Beach NWLON station.
Project Instruction Requirements Complete FY 2015:
1. MWWL Installation and complete MET.
Future Work:
1. Submit photos of bench mark 863 5027 A.
2. Submit face and setting photos of bench mark 863 5027 B.
3. From the 10 marks in the network, there is only 1 class B or higher mark. Set more class B or higher marks.
4. Update the lat/long for TIDAL 2 and U 460. The coordinates in windesc indicate both BM's are in the same spot.

3.0 Sensor Test Worksheet

Reoccurring sensor testing and calibration are imperative to ensure the accurate water level heights are recorded. The sensor test worksheet documents the performance test results of the primary and backup water level sensors, ancillary sensors, and the GOES transmissions; and the barometric pressure sensor calibration results. This worksheet is submitted with eSite reports, whenever sensors are installed, inspected, or replaced. Example of a sensor test worksheet:

Sensor Test Worksheet

Station Name: Dahlgren, VA Station Number: 863-5027

Personnel: Metzger, Stepnowski, Basnett, Sager, Barwick Date: 9/21-25/15

This form shall be used to document sensor test data. It shall be submitted with a NWLMS Site Report form whenever sensors are installed, inspected, or replaced.

Aquatrak Sounding Tube Assembly Test (See Section 4.1.1 C)

"READ AQT A" (Xpert display) value = [ ] + Offset: [ ] = 0.0000 Aquatrak S/N:

Sounding Tube Length (leveling point to end of anti-fouling tube) = [ ] Cal Tube S/N:

Differential = 0.0000 Sensor Offset:

(+/- 0.06 m allowable)

Temperature Sensors Test

(See Section 4.1.1 C)

T1 = upper thermistor, T2 = lower, Tw = water, Ta = air, Tb = backup

Time	T1	T2	Tw	Ta	Tb
			28.60	28.90	

The difference between sensors should not exceed +/- 0.3 degrees C.
If the differential exceeds +/- 1.0 degree C, consult NOAA about a replacement.

Comments:

Backup Pressure Sensor Test

(See Section 4.1.2 A)

Backup Sensor s/n:

Time	Sensor	Time	Sensor	Time	Sensor

Barometer Calibration

(See Section 5.2.2)

Baro S/N: 1406018 Portable S/N:

Time	Station Baro	Portable	Delta
945	1001.50	1001.90	0.40

If delta is less than ± 0.2 mb no adjustment required.
If difference > ± 0.2 mb but < ± 1.0 mb then calibrate sensor and note new offset below.
If difference > ± 1.0 mb, then barometer must be replaced.
Check for sensor drift, if > ± 1.0 mb, then barometer must be replaced.

New coefficient 2 (if adjusted): 0

Comments:

GOES Transmission Test (See Section 4.2.2 H)

Antenna S/N:
Cable Type:
Cable Length:

	RTU End	Antenna End
Power output (into dummy load		
Forward Power (in-line)		
Reflected Power (in-line)		

If power at antenna end is less than 7 watts, or if substantial line loss is detected, contact headquarters for further direction. Substantial line loss if defined as being greater than 3 watts loss per 7 watts of power / 10 meters of cable.

Comments:

Additional Sensors Tests: Ancillary sensor tests, data comparisons, supplementary test data, remarks, etc.

Comments:

Wind Monitors

Speed (Tolerance = ± 1.1 m/s)

Time	Pwind	Handheld	Time	Rwind	Handheld
950	180.0		950	181.0	

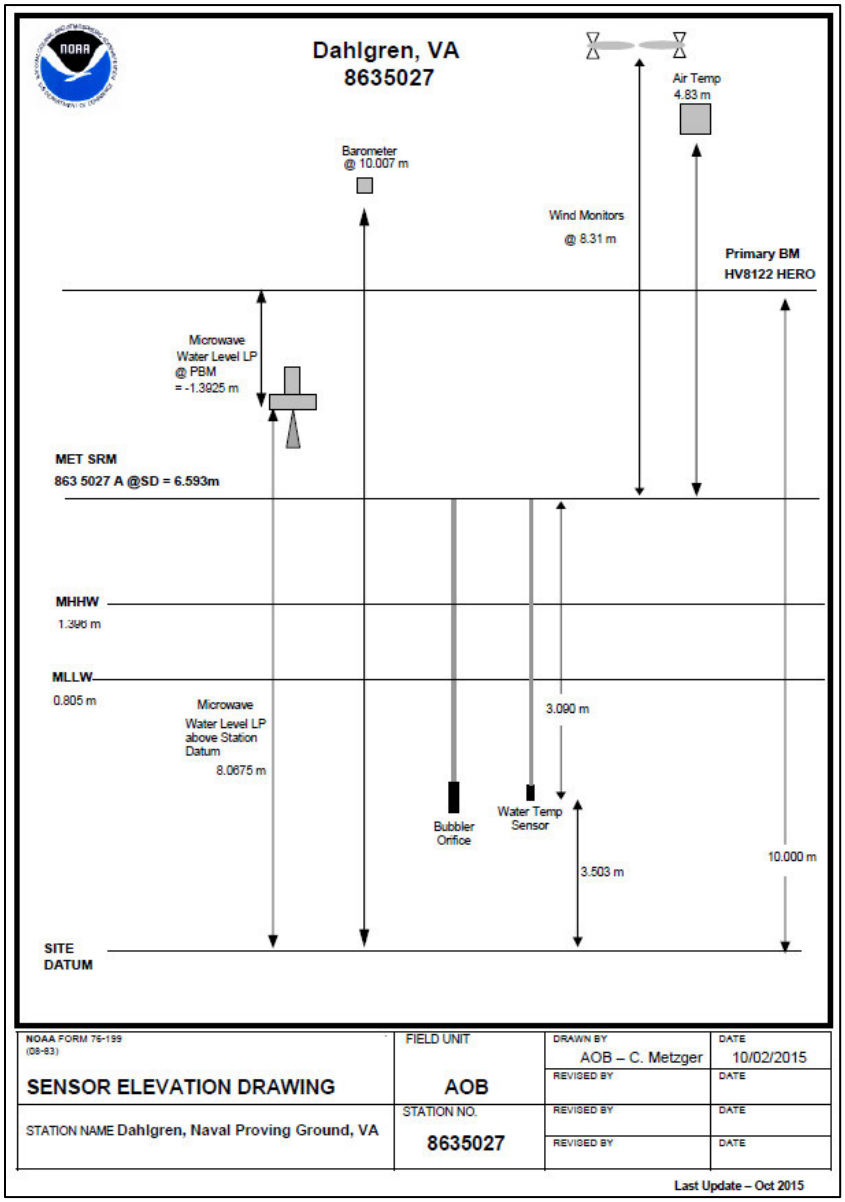
Direction (Tolerance = ± 5 deg)

Heading	Pwind	Rwind
0°	Good	Good
90°	Good	Good
180°	Good	Good
270°	Good	Good

4.0 Sensor Elevation Drawing

The sensor elevation drawing is a diagram of the sensor heights for all water level, meteorological and ancillary sensors that are incorporated at each water level observing station. The diagram specifies the station datum, along with the Mean Lower Low Water (MLLW) and the Mean Higher High Water (MHHW), if known. Additionally, the diagram shows an elevational comparison between the sensors, datums, and primary bench mark in a profile view. If new stations, show sensor elevations on station datum only; once the tidal datums are determined, the diagram should be updated with the datum information. This document is to be updated when new sensors are installed / relocated and/or when the accepted datum offset has been updated.

Example of a sensor elevation drawing:

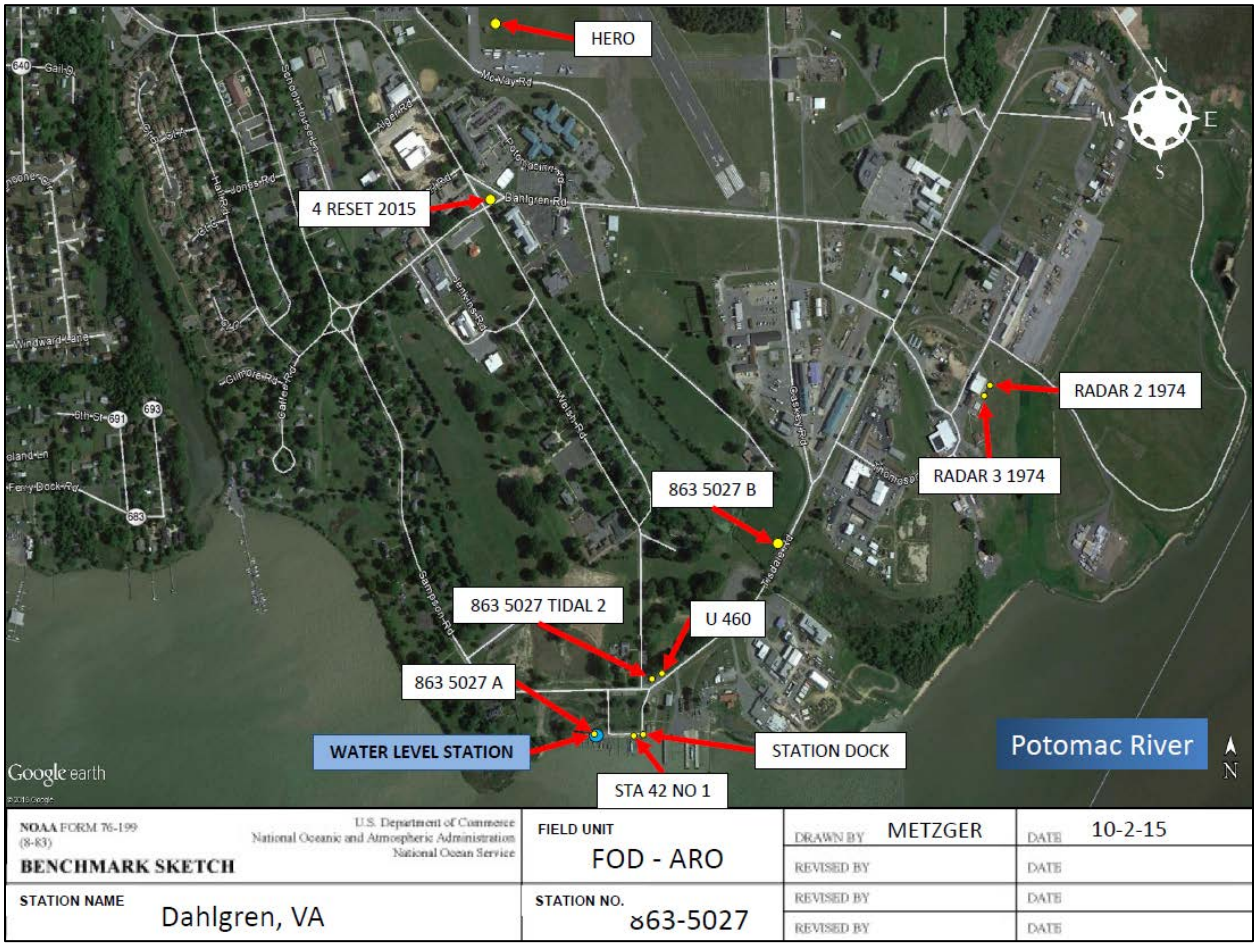


5.0 Bench Mark Diagram

The bench mark diagram should reveal the relative location of the water level sensor(s), tide staff (if any), the body of water being observed, bench marks, and major reference objects found in the bench mark descriptions. There should also be a compass included in the diagram, as well as a title block. The title block should contain these items (below), if applicable:

- Station name / number
- NOAA chart number
- USGS Quad name
- Field unit
- Date created
- Author / illustrator
- Latitude and longitude (obtained from hand-held GPS receiver) of the gauge

Example of a bench mark diagram:



6.0 Bench Mark Descriptions

Bench mark descriptions are integral in recovering individual bench marks. The bench mark descriptive text should provide clear, concise, and accurate instructions on how to recover a bench mark using easily identified objects located within a reasonable distance from the bench mark. The assumption is made that the user is not familiar with the surroundings. *CO-OPS User Guide for Writing Bench Mark Descriptions* can be found at http://tidesandcurrents.noaa.gov/fieldlibrary/ViewLibrary?q=Writing+bench+mark.

Example of a bench mark description:

> From the Post Office in (city), proceed north on Main Street for 3.4 km (2.1 mi), then go east on Columbia Boulevard for 0.8 km (0.5 mi) to the city harbor and Municipal Pier No. 11 North, the bench mark is a disk set in top of the concrete footing for a building on the east end of Municipal Pier No. 11 North (Marine Police and Fire Boat Pier), 14.57 m (47.8 ft) north of the south face of the pier, 9.81 m (32.2 ft) south of the north face of the pier, 6.49 m (21.3 ft) west of the east end of the pier, and 0.37 m (1.2 ft) south of the north end of a steel door opening.

> From the intersection of US Highway 322 and Washington Avenue in (city), proceed east on Washington Avenue for 2.4 km (1.5 mi), then go north on Christopher Columbus Avenue for 0.3 km (0.2 mi), the primary bench mark is a disk located near the front lawn of the USCG Marine Safety Office property, 45.90 m (150.6 ft) NW of the flagpole at the entrance of the main building, 24.69 m (81.0 ft) south of the light pole on the east side of Christopher Columbus Avenue, 9.20 m (30.2 ft) NNE of the north curb of Washington Avenue, 8.41 m (27.6 ft) SE of the eastern curb of Christopher Columbus Avenue, and 8.14 m (26.7 ft) east of the traffic signal post at the NE corner of Washington and Christopher Columbus Avenues. The bench mark is set 18 cm (0.6 ft) below ground, crimped to a stainless steel rod driven 11.9 m (39 ft) to refusal, and encased in a 5-inch PVC pipe with concrete kickblock.

> From the intersection of Baltimore Street and Moale Avenue in (city), proceed north on Baltimore Street for 1.4 km (0.9 mi), the bench mark is a flange-encased rod set 23.59 m (77.4 ft) SW of the center and at the end of Baltimore Street, 7.32 m (24.0 ft) SSW of the approximate centerline of Baltimore Street, 0.49 m (1.6 ft) NE of the SE corner of a 3.00 m x 3.00 m (9.8 ft x 9.8 ft) concrete pad that surrounds a drainage culvert, and 0.40 m (1.3 ft) NE of a 3-inch PVC witness post. The datum point is set 15 cm (0.5 ft) below the ground, being the top of a stainless steel rod driven 17.1 m (56 ft) to refusal, and encased in a 5-inch NGS logo cap.

7.0 Station 'To-Reach' Statement

The Station To-Reach statement provides easily followed directions on how to reach a water level station, the sensors and the associated bench marks. It is also used on the Published Bench Mark Sheet. These directions are written for the user who is unfamiliar with the area. Thus, the Station To-Reach statement should start from a readily found prominent landmark, use the mode of transportation most common to the area, and guide the user to the station via the most direct and major route.

Example of a Station To-Reach statement:

> To reach the tidal bench marks from the U.S. Post Office on Main Street, proceed north on Main Street for 1.3 km (0.8 mi) to the intersection with Second Avenue, then west on Second Avenue for 3.2 km (2.0 mi) to its termination with Harbor Road, then SW on Harbor Road for 5.6 km (3.5 mi) to the small boat harbor and fishing pier. The bench marks are along Harbor Road and the waterfront area. The tide gauge and staff were located 4.51 m (14.8 ft) south of the offshore end of the wharf.

8.0 Digital Photographs

Digital photographs are useful for station (bench mark) reconnaissance, bench mark recovery, bench mark and sensor stability assessment. Digital photographs of each bench mark disk should include close-up, eye level, and at least two different direction horizontal views. There should also be digital photographs of the station, DCP, equipment, underwater components, and the general vicinity. Photographs must follow the naming convention documented in the Standing Project Instructions or CO-OPS Specifications and Deliverables document. All digital photographs should be submitted in JPEG format.

Example of digital photographs:







9.0 Precise Leveling Abstract

An abstract of precise leveling should be submitted for each second order, class I or third order level run. The abstract shall show the separate results of each run over each section (including rejected sections), the mean difference, the divergence, the length of the section, the designation of each section, the cumulative divergence and distance of each bench mark from the primary sensor, staff and / or electronic tape gauge, and the total distance (all spurs) of levels run. Rejected runs are designated by an R placed beside the rejected number.

Example of a precise leveling abstract:

TRANSLEV Version 4.17.00 Tue Feb 10 17:16:43 2015

-*- FIELD ABSTRACT -*-

150110-150110 L28053/2 6.0 MM ORDER 2 CLASS 1 PAGE 1

2015 LEVELING TO TIDE STATIONS IN LOUSIANA 876 0922 PILOT STATION EAST

SSN	PID	MARK DESIGNATION	STARTING DATE	START TIME	START TEMP	DIST (KM)	ELEV DIFF (METERS)	CODE	-(F+B) (MM)	FIELD ELEV (METERS)	PUB ELEV (METERS)	I	S	L
0211		876 0922 F								10.19800				
0211		876 0922 F	20150110	13:00	F 10.1	0.113	0.49005	*	-0.36	0.48987		1	S	1
0219		876 0922 J	20150110	15:02	B 10.1	0.113	-0.48969	*				1	S	1
						0.113			-0.36	10.68787				
0219		876 0922 J	20150110	13:45	F 10.1	0.030	-0.49603	*	-1.26	-0.49666		1	S	1
0217		876 0922 G	20150110	14:22	B 10.1	0.030	0.49729	*				1	S	1
						0.143			-1.62	10.19121				
0211		876 0922 F	20150110	12:10	B 10.1	0.037	0.01145	*	0.18	-0.01154		1	M	
0218		876 0922 H	20150110	12:25	F 10.1	0.037	-0.01163	*				1	M	
						0.037			0.18	10.18646				
0218		876 0922 H	20150110	10:22	B 10.1	0.097	0.16369	*	1.23	-0.16431		1	M	
0205		TBM BOLT	20150110	10:55	F 10.1	0.096	-0.16492	*				1	M	
						0.133			1.41	10.02215				
0205		TBM BOLT	20150110	09:32	B 10.1	0.055	-2.96482	*	-0.13	2.96489		1	M	
0213		876 0922 B	20150110	09:58	F 10.1	0.055	2.96495	*				1	M	
						0.188			1.28	12.98704				
0213		876 0922 B	20150110	09:21	B 10.1	0.029	-0.07300	*	1.35	0.07233		1	M	
0212		876 0922 A	20150110	10:15	F 10.1	0.029	0.07165	*				1	M	
						0.217			2.63	13.05936				
0212		876 0922 A	20150110	09:10	B 10.1	0.011	-0.43562	*	-0.05	0.43565		1	M	
0208		TBM 876 0922 AQUATRAK	20150110	09:15	F 10.1	0.011	0.43567	*				1	M	
						0.228			2.58	13.49501				

ELEVATION REJECTION AND ERROR CODES

* - The section elevation difference does not include rod corrections.

INSTRUMENT/RODSET	INSTRUMENT	RODS	
1	243 - 337624	396 - 24050	396 - 25946

The shortest path between starting and ending points is:
0211 0218 0205 0213 0212 0208

The shortest distance between starting and ending points is:
0.228 km.

SEGMENT(S) & RUNNING ORDER

--- Survey point numbers ---	length	S	L
0211 0219 0217	0.143	S	1
0211 0218 0205 0213 0212 0208	0.228	M	

FROM	TO	N. LATITUDE	W. LONGITUDE	FIELD DISTANCE	VS. COMPUTED
0211	0219	285557	0892420	0.11	0.04
0219	0217	285556	0892419	0.03	0.04
0211	0218	285555	0892422	0.04	0.04
0218	0205	285555	0892423	0.10	0.03
0205	0213	285556	0892425	0.06	0.06
0213	0212	285557	0892426	0.03	0.04
0212	0208	285556	0892426	0.01	0.03

* - The observed vs. computed difference exceeds 200 meters

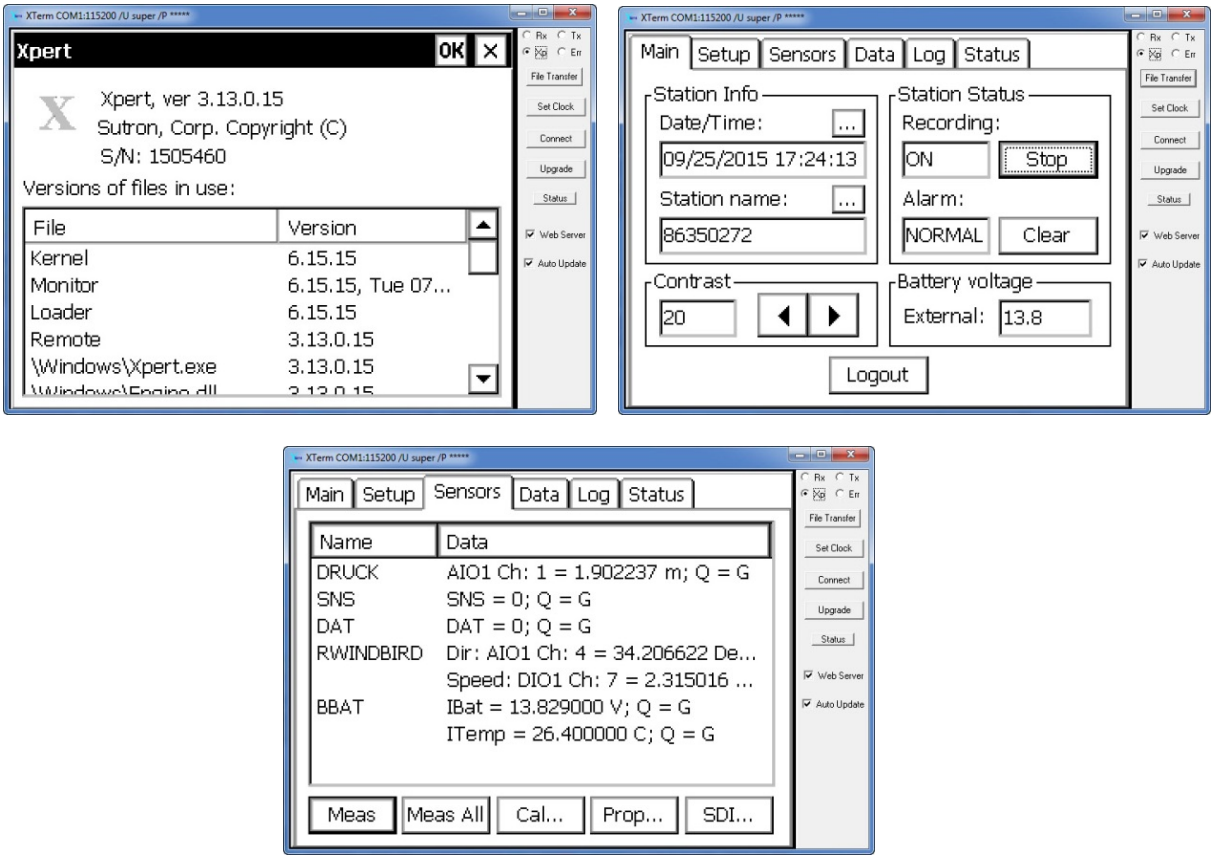
10.0 Datum Offset Computation Worksheet

The leveling connection to the water level sensors should occur at the sensor leveling point (e.g., top of the geodetic collar on a microwave radar sensor). The sensor leveling point is included in the leveling to derive the sensors' elevation relative to the station datum. The derived sensor elevation is applied to the observed water level data to calculate the water level data on station datum. The elevation of the water level sensor is measured via leveling annually, and if the sensor leveling point elevation is greater than the old sensor leveling point elevation, the difference is positive and a constant need to be added to the water level data. If the new sensor leveling point elevation is less than the old sensor leveling point elevation, the difference is negative and a constant needs to be subtracted from the water level data. Changes to the offset only occur when the new elevation is ±6mm from the previous stored value.

11.0 Format for Downloaded Data

There are two methods to properly download data from the Sutron XPert dataloggers. The first method requires the use of the Xterm Graphical User Interface Screen Personal Computer terminal program, and the other method can use any terminal program that can save a file such as ProComm. Using Xterm is the preferred downloading method.

Example of Xterm GUI Screen for PC:



12.0 GPS Deliverables

GPS Deliverables include attaching the Online Positioning User Service (OPUS) published datasheet and the shared solution datasheet and four photographs of the bench mark. The shared solution datasheet details coordinates in UTM and SPC format, as well as information on the nearest published bench mark.

Example of a shared solution datasheet:

Shared Solution

PID: BBDS66
Designation: 876 0922 J
Stamping: 0922 J 2015
Stability: Most reliable; expected to hold position well
Setting: Stainless steel rod in sleeve (10FT+ or 3.048M+)
Description: FROM THE VENICE, LA. MARINA PROCEED BY BOAT DOWN THE MISSISSIPPI RIVER APPROXIMATELY 28 MILES TO THE NEW PILOTS ASSOCIATION BUILDING IN THE MARSHY AREA JUST OFF THE PILOTS WOOD DOCK ON THE INSHORE END, 53.0 M EAST OF ROCKY JETTY, 25.9 M NORTHWEST OF BENCH MARK 876 0922 G, 11.6 M SOUTH FROM EDGE OF CREEK, 15 CM EAST OF THE WITNESS POST. THE DATUM POINT IS SET 75.0 CM ABOVE THE GROUND, BEING THE TOP OF A STAINLESS STEEL ROD DRIVEN 27.5 M TO REFUSAL, AND ENCASED IN A 6-INCH LOGO CAP.
Observed: 2015-01-11T12:34:00Z
Source: OPUS - page5 1209.04

Close-up View

REF_FRAME: NAD_83(2011) | EPOCH: 2010.0000 | SOURCE: NAVD88 (Computed using GEOID12A) | UNITS: m | SET PROFILE | DETAILS

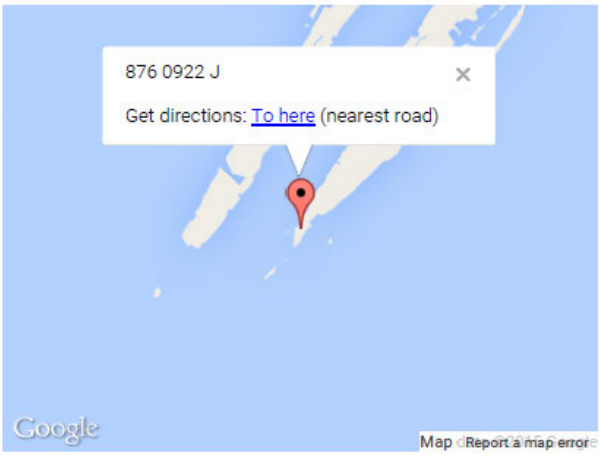
LAT:	28° 55' 56.69985"	± 0.004 m
LON:	-89° 24' 19.59934"	± 0.006 m
ELL HT:	-22.102	± 0.008 m
X:	57969.265	± 0.006 m
Y:	-5586145.741	± 0.008 m
Z:	3067336.926	± 0.005 m
ORTHO HT:	1.143	± 0.018 m

	UTM 16	SPC 1702(LA S)
NORTHING:	3202880.074m	49515.089m
EASTING:	265520.748m	1187983.045m
CONVERGENCE:	-1.16423217°	0.96396900°
POINT SCALE:	1.00027853	1.00009812
COMBINED FACTOR:	1.00028200	1.00010159

CONTRIBUTED BY

jim
Air-Sea Systems

Horizon View

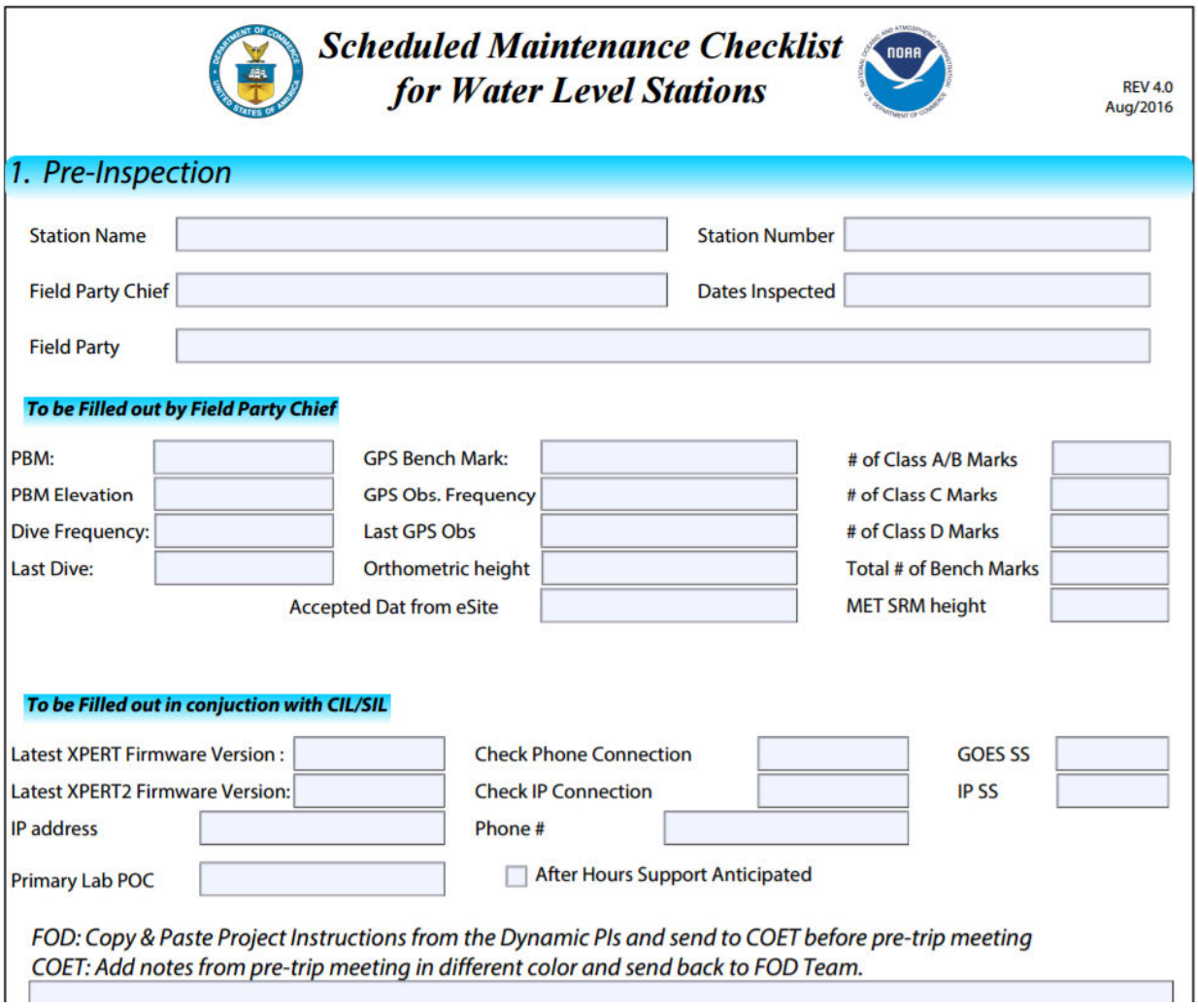


The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

13.0 Scheduled Maintenance Checklist

The scheduled maintenance checklist is applicable to all stations. CO-OPS water level observing stations require routine maintenance to ensure the equipment is working properly and is upheld to sustain high standards of efficiency. Routine Maintenance includes checking for leveling adjustments, examining tidal benchmarks, retrieving water level data, assessing the conditions of the equipment and sensors, and routinely replacing equipment that may be outdated.

The latest version of the Scheduled Maintenance Checklist was completed in October 2016, and can be found here:
http://tidesandcurrents.noaa.gov/fieldlibrary/ViewLibrary?q=Scheduled+Maintenance+Checklist



Scheduled Maintenance Checklist for Water Level Stations

REV 4.0
Aug/2016

1. Pre-Inspection

Station Name		Station Number	
Field Party Chief		Dates Inspected	
Field Party			

To be Filled out by Field Party Chief

PBM:		GPS Bench Mark:		# of Class A/B Marks	
PBM Elevation		GPS Obs. Frequency		# of Class C Marks	
Dive Frequency:		Last GPS Obs		# of Class D Marks	
Last Dive:		Orthometric height		Total # of Bench Marks	
		Accepted Dat from eSite		MET SRM height	

To be Filled out in conjuction with CIL/SIL

Latest XPERT Firmware Version :		Check Phone Connection		GOES SS	
Latest XPERT2 Firmware Version:		Check IP Connection		IP SS	
IP address		Phone #			
Primary Lab POC		☐ After Hours Support Anticipated			

FOD: Copy & Paste Project Instructions from the Dynamic PIs and send to COET before pre-trip meeting
COET: Add notes from pre-trip meeting in different color and send back to FOD Team.

14.0 Diving Documents

Diving documents may include anything ranging from a dive operations plan to a diving emergency assistance plan. These documents can outline the "who, when, where, what, and why" of a diving event or even general procedures and contacts for each unique diving location. Any photos and videos taken during the dive should also be submitted.

Example of diving documents:

NOAA Form 57-03-20
(7-14)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

DIVE OPERATIONS PLAN

DIVE OPERATIONS

DATE(S) of DIVE OPERATIONS	01/21/2015	DIVE OPS START TIME	10:00	DIVE OPS STOP TIME	12:00
LOCATION of DIVE OPERATIONS	Hilo, HI	DISTANCE FROM SHORE	10 yards	EVAC TIME to CHAMBER	2 hours
PLATFORM or FACILITY	Pier	DEPTH RANGE	0-30 ft	NUMBER of DIVERS	2
PLANNED NUMBER of DIVE EVOLUTIONS PER DAY	2	MAXIMUM NUMBER of DIVES to be LOGGED PER DAY	2	NUMBER of CONSECUTIVE DIVE DAYS	2

SAFE SHIP CHECKLIST REQUIRED	YES ☐ NO ☑	DIVE MODE	OPEN CIRCUIT SCUBA ☑ REBREATHER ☐	DIVE PURPOSE	SCIENTIFIC DIVE ☐ WORKING DIVE ☑
FLOAT PLAN REQUIRED	YES ☐ NO ☑	DECOMPRESSION CALCULATION	DIVE COMPUTER ☐ DECOMPRESSION TABLES ☑	DIVE DUTY	ON-DUTY DIVE ☑ OFF-DUTY DIVE w/SEP GEAR ☐

DIVERS (Attach additional sheets if more than 12 divers participate in the dive)

DIVEMASTER Drew Maczko	LEAD DIVER Keith Brkich	DIVER Eric White
DIVER DPIC/Tender: Clyde Kakazu	DIVER	DIVER
DIVER	DIVER	DIVER
DIVER	DIVER	DIVER

DESCRIPTION

PURPOSE of DIVES and TASKS to be PERFORMED
Annual inspection and maintenance on tide gauge equipment: cleaning, inspection of well and brackets, help with meaurements and leveling of orifice

PRINCIPAL DIVER WORN EQIUPMENT and BREATHING MEDIA
Thermal protection as needed (shorty to full wetsuit 2-5mm), SEP w/ Spare Air, Tethered/communications, SCUBA equipment

TOOLS and SPECIALIZED EQUIPMENT to be USED — Tethered comms dive? YES ☐ NO ☑
Scrapers, wrenches, socket with ratchet, hammer, steel measuring tape

POTENTIAL HAZARDS and MITIGATIONS (Certain hazards are present on all dives (AGE, DCS, drowning, etc.). The hazards listed below are unique to this operation.)
Barge operations, shipping area, low visibility, wave/surge action, aquatic animals, impact with pier/jetty, equipment malfunction, entanglement, diving-related medical emergencies, stinging hydroids.
Mitigations- coordination with operators to avoid shipping operations, stand by rescue diver, protective clothing, no dive during hazardous waves or weather.

PRIMARY MEANS of EVACUATION for EMERGENCIES
Ground transportation by ambulance, evac to chamber by Life Flight or helicopter to Oahu

AUTHORIZATION

SUBMITTED BY (DIVEMASTER/LEAD DIVER) Diver: Eric White	SIGNATURE WHITE.ERIC.A.1404675814	DATE 12/15/14
APPROVED BY (UNIT DIVING SUPERVISOR/DESIGNEE) Mark Bailey	SIGNATURE	DATE 12/16/14

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U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

DIVING EMERGENCY ASSISTANCE PLAN

NOAA DIVING UNIT	DIVE LOCATION	DATE
NOS/CO-OPS/FOD/POB	Hilo, Hawaii	2015

INSTRUCTIONS:

Complete a Diving Emergency Assistance Plan (DEAP) for each unique diving location and submit the plan to NDP.Diveplans@noaa.gov with the initial dive plan of each calendar year and every time any information on the DEAP changes.

GENERAL PROCEDURES:

A. Evaluate the victim's Circulation, Airway, and Breathing (CABs). If necessary, begin cardiopulmonary resuscitation (CPR) using a manually triggered ventilator (MTV) or bag-type oxygen resuscitator.

B. If the victim is breathing, but unconscious, place the victim in the recovery position and administer oxygen using a non-rebreather type mask.

C. If the victim is awake and alert, place the victim in a position of comfort and administer 100% oxygen using an MTV/demand oxygen resuscitator or non-rebreather type mask. If the victim is not nauseated, give clear non-alcoholic/non-caffeinated fluids to drink.

D. If the victim's condition is life threatening or urgent, call the local Emergency Medical Services (EMS) or U. S. Coast Guard (USCG) for transport to the nearest medical treatment facility.

E. If the victim's condition is not urgent, contact the NOAA Dive Medical Officer (DMO) for guidance. If unable to reach the NOAA DMO with 15 minutes, contact the Divers' Alert Network (DAN).

F. Use the Dive Accident Management Field Reference Guide to document a neurological exam and dive history information.

G. Gather additional information about the incident and prepare the victim for transport.

H. Secure the diver's gear for inspection. **DO NOT DISASSEMBLE GEAR OR EXHAUST AIR FROM THE SYSTEM.** Close the cylinder valve ONLY. Count and record number of turns required to secure the valve.

I. Call and speak to the NOAA DMO, (855) 822-DIVE (3483), to report the incident.

J. Call the Line Office Diving Officer (LODO) to report incident. If unable to reach the LODO, call the Deputy LODO. Continue calling until positive contact is made. Speak to a person, don't just leave a message.

EMERGENCY TRANSPORTATION CONTACTS:

Primary Shore Based Emergency Transportation	
NAME of TRANSPORTATION PROVIDER	EMS
POINT of CONTACT	Operator/911
PHONE NUMBER	

Secondary Shore Based Emergency Transportation	
NAME of TRANSPORTATION PROVIDER	EMS
POINT of CONTACT	
PHONE NUMBER	

At Sea Vessel Emergency Transportation	
NAME of TRANSPORTATION PROVIDER	USCG Honolulu, HI
POINT of CONTACT	Operator
PHONE NUMBER	(808)535-3333

At Sea Aviation Emergency Transportation	
NAME of TRANSPORTATION PROVIDER	USCG
POINT of CONTACT	Operator
PHONE NUMBER	(800)982-8813

15.0 Pertinent Documents (If Applicable)

These are the remaining documents that can be submitted for water level observing stations. One of the ensuing documents is required for water level observing stations within the Great Lakes region. The remaining subsequent documents are helpful as metadata, but are not a necessity for COET. Most of the information below pertains to leveling and/or surveying, as well as legal documents.

Non-essentials

*Water level transfer form (for Great Lakes stations only)

*Levels (electronic files) including leveling equipment information and field notes of precise leveling

*Staff to gauge observations (Microsoft Excel format)

*Calibration certificates for Invar leveling rods

*Calibration records for sensors

*Agreements, MOU, contract documents, utilities/pier agreements, etc.

*Other information as appropriate, or as specified in the contract