



CO-OPS Evaluation Criteria for Water Level Station Documentation

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1. Title

CO-OPS Evaluation Criteria for Water Level Station Documentation

2. Purpose

CO-OPS Engineering Division's (ED) Configuration and Operational Engineering Team (COET) personnel and task managers are required to evaluate the quality of water level and meteorological station documentation submitted for entry in the database and in the water level station package. The evaluation criteria described here provides guidelines for COET regarding the specifics of why, how, and what to look for in the submitted documentation. The evaluation criteria described in this document will help the field parties understand how COET evaluates the submitted documentation and quantifies the comments and deficiencies. COET and Task Managers (TM) evaluate submitted documentation, note any deficiencies on the records evaluation document and provide it to the responsible field party chief for correction and/or resubmission. For more information on documentation requirements, please refer to the specifications listed in the Standing Project Instructions, which are available at CO-OPS' website on publications page.

3. Background/History

ED/COET is the steward for the documentation and metadata for the water level and meteorological stations for the CO-OPS Database Management System (DMS) Data Processing and Analysis Subsystem (DPAS) database. It is CO-OPS requirement and COET responsibility to ensure that the submitted water level station documentation is complete, timely, meets the specifications, and is of a high quality. Metadata is required to completely describe the data used for all of CO-OPS products, and for various applications that generate the products and services CO-OPS offers. The National Water Level Observation Network (NWLON) supports various other programs, applications, and projects such as Physical Oceanographic Real Time System (PORTS®), hydrographic and photogrammetry surveys, long term sea level rise studies, tsunami detection and notification, marine boundary determinations, and coastal management.

Field submitted documentation is the source of all this metadata which supports various CO-OPS programs and applications. These procedures are designed to provide detailed feedback to CO-OPS field parties and contractors in order to ensure that CO-OPS receives the most complete, required, and highest quality documentation for each remote and field site visit.



4. Scope/Applicability

These procedures are applicable to all of the water level station data submitted for the NWLON, stations installed to support hydrographic and photogrammetry surveys, Physical Oceanographic Real Time Systems (PORTS[®]), Coastal Oceanographic Applications and Services of Tides and Lakes (COASTAL), non-reimbursable and reimbursable special projects where the data is stored in Data Management System (DMS) and in station packages. These procedures are applicable for the water level station data submitted by CO-OPS Field Operations Division, CO-OPS' IDIQ contractors, OCS and NGS contractors, and others.

5. Main Processes

First, a few definitions are defined for the three types of documentation.

24 Hour Notification

A one-day site report or email stating the critical information required to configure sensors installed at water level or meteorological stations.

Preliminary Documentation

This includes all the required documentation that needs to be submitted to CO-OPS within 30 days or as stipulated in the contract from the completion of the annual maintenance, installation, removal, emergency maintenance, or meteorological upgrade.

Revised Final Documentation

This includes all the required documentation revisions after COET and the Task Manager provided comments on the deficiencies found in the 30-day preliminary documentation. If there are no deficiencies in the 30-day preliminary documentation, then that documentation can be designated as final documentation.

The procedures detailed in Section 6 below are applicable to and first performed on the documentation received from the CO-OPS field party or contractor after performing work in the field. The procedures are repeated on each set of revised documentation received until all deficiencies have been addressed. Appendix A contains the form used to record all evaluations.

6. Detailed Sub-Processes/Checklists

Deliverables Timeliness

- One-day site report or email notification received within 24 hours of the conclusion of a maintenance event.
- Preliminary documents received within 30 days of the conclusion of the maintenance event.

Transmittal letter (PDF)

- Required for each submission.



eSite Report (or in a file format agreed upon in the kickoff meeting or specified in the contract)

- Required for installation, annual inspection, emergency maintenance, remote maintenance [corrective or preventive], bracketing levels, and removal of a water level station.
- All applicable information shall be completed. Serial numbers of DCP/sensors shall be documented. Dates of installation/removal/replacement of DCP(s)/sensor(s) and levels shall also be listed.
- Latitude/longitude for DCPs and all sensors in d/m/s.x format as determined by a handheld GPS shall be provided.
- Date/time of sensor offset change entered in Xpert DCP (time of startup after upgrade) shall be provided.
- Date/time of new datum offset entered in Xpert DCP shall be provided.
- Metadata shall be provided for ancillary sensors, (include the sensor heights relative to the appropriate datum).
- Actual notes on results of dive inspection or cleaning of underwater components shall be provided. The degree of fouling on underwater components shall be noted.
- The status of a valid tie to NAVD88 shall be listed in level section remarks, where applicable.
- Excessive movement of water level sensor or bench marks (BM) shall be documented in the level section remarks, if applicable.
- In station notes, include the following details as applicable: any required security clearances and points of contact (POC) for clearances, advanced notice requirement and (POC), dive rental contact info, other useful logistic information such as local hardware stores, lodging, etc.

Sensor Test Worksheet (PDF)

- Completed and submitted, if applicable.

Sensor Elevation Drawing (PDF)

- Show harbor bottom, supporting structure elevation, station datum, and sensor elevations.

Water Level Transfer Form (for Great Lakes Stations Only – PDF)

- Completed and submitted.

Bench Mark Diagram (PDF)

- Required for new stations or reoccupied historic stations.
- Standard title block shall include: the station name and number, NOAA chart number, USGS Quad name, field unit, date created, drawn by, and latitude and longitude (obtained from hand-held GPS receiver) of the gauge.
- North arrow shall be shown.
- Gauge and bench marks locations shall be shown, major reference objects shall be noted in the bench mark descriptions, and the local body of water shall be labeled.
- All active (recovered and not recovered) bench marks shall be identified by designation; bench marks confirmed as destroyed shall be removed from the bench



mark diagram.

Bench Mark Descriptions/Recovery Notes

- WinDesc Program:
 - Required for optical and digital leveling
 - All DES file codes shall be completed accurately.
 - Text description shall begin with a statement on how to reach the mark, followed by the description in NOS format (Refer to User's Guide for Writing Bench Mark Descriptions which is available on CO-OPS Publications web page).
 - Handheld GPS positions shall be listed in d/m/s.x format.

Station "To Reach" Statement

- Provided in proper NOS format (Refer to User's Guide for Writing Bench Mark Descriptions which is available on CO-OPS Publications web page) in the eSite Report and/or separately in a text document (in a file format agreed upon in the kickoff meeting).

Digital Photographs (JPG)

- Photos must be from digital camera and must be clearly in focus. Photos are required only if noted in the station specific project instructions or if existing equipment has changed, or new bench marks established.
- Station Photos shall show tide house/water level gauge house shelter and its nearby area (to show station and sensors in relation to their physical surroundings), well and brackets, DCPs. File name of a photo shall start with a station number followed by the specific view, and jpg extension (e.g. 8661070 inside shelter.jpg)
 - Several shots of met tower and sensors from different directions shall be submitted (e.g. 8661070 met tower looking SW.jpg)
- Bench Mark Photos are required – (1) close up on disk face, with GPS handheld in view; (2) chest high view of setting; (3) two photos from two different (perpendicular) directions showing general location for all new marks. File names shall start with the station number in all cases with no hyphens or blank space and follow CO-OPS' file naming convention for bench mark photos. (Refer to CO-OPS Specifications or Standing Project Instructions as appropriate).

Levels

- Marks leveled during this inspection shall include those not leveled to during the previous year (in addition, all marks must be leveled to once every two years), and/or marks must be connected as noted in the annual specific station requirements. Explanation shall be provided for any marks not leveled to during the current level run. Always include the GPS benchmark in the run when a GPS session is performed.
- Non-electronic (optical) - in a file format agreed upon in the kickoff meeting or specified in the contract:
 - C-shot notes shall be provided.
 - Level note pages shall be filled out completely; and marks shall be identified by designation.



- If level note pages are in Excel format, the page for the backward run must be modified to include the section marks (as on the forward run page).
- NOS-approved Wiz level notes are acceptable in existing format.
- Sectional and overall closures shall be within allowable.
- Abstracted mark elevations shall start with PBM accepted elevation and end with the Primary Sensor elevation above station datum (spur to primary sensor).
- Check for valid tie to NAVD88, where applicable
- Translev Program:
 - Original GSI file shall be provided in separate folder if GSI is edited.
 - All file dates must be chronologically consistent; the DES and INX files cannot have dates more recent than that for the ABS file.
 - Error flags are not allowed on sectional distances of the abstract.
 - Abstracted mark elevations shall start with PBM accepted elevation and end with the Primary Sensor elevation above station datum.
 - Check for valid tie to NAVD88, where applicable.
 - Invar rod calibration certificates are required for the first-time digital leveling.

Datum Offset Computation Worksheet or Staff/Gauge Different Worksheet

- Show how sensor “zero” measurement point is referenced to the bench marks and datums.

Staff to Gauge Observations (Spreadsheet)

- If applicable, submit.

Calibration Certificates for Invar Leveling Rods (PDF)

- If applicable, submit.

Calibration Records for Sensors (PDF)

- If applicable, submit.

Agreements, MOU, Contract Documents, Utilities/Pier Agreements, etc. (PDF)

- If applicable, submit.

Other Station Information

- If applicable, submit lease or license agreements with owner, contract documents, etc.

Water Level Data Download

- Zmodem file (Xpert, Dark, 9210) of downloaded data from the primary and/or backup DCP for known periods of missing transmissions or maintenance actions (minimum 15 days of data required).
- Data download must be in .txt format (or in a file format agreed upon in the kickoff meeting or specified in the contract) for loading in DMS. The file name format is xxxxxxxy.txt where xxxxxxx is the station id and y is the DCP number.

GPS Documentation

- GPS observations shall be performed on the designated GPS Bench Mark (GPSBM); explanation shall be provided if another mark is selected.
- Data file shall be submitted to OPUS for publication; digital and hard copy of OPUS



- published datasheet shall be submitted along with four photos of the GPSBM.
- GPS submission shall meet all other criteria as stated in the User's Guide for GPS Observations.

Annual Inspection Checklist

- Shall be completed and submitted in electronic format.

Diving Documents

- DAMP, if applicable
- Dive Plan, if applicable

Annual Inspection Station Specific Requirements

- All items shall be documented as completed, or should be explained sufficiently in the appropriate comment section of the site report. Document the work to be performed the next year in the appropriate comment section of the site report.

Task Order Deliverables

- Deliverables include any additional requirements specified in the task order for that particular station.

7. Quality Assurance/Control

ED/COET and Task Managers are responsible for the quality assurance of the documentation.

8. Management/Responsibility

ED/COET is responsible for maintaining and updating this SOP.

9. Appendix A

See the following page for the Records Evaluation template.

CO-OPS WATER LEVEL STATION RECORDS EVALUATION

STATION NAME:
STATION NUMBER:
PARTY CHIEF/FIELD PARTY-CONTRACTOR:
DATE OF O&M:
EVALUATOR:
DATE O&M PAPERWORK RECEIVED:
DATE EVALUATED:

Deficiencies in documentation noted in red – action needed listed below; acknowledgements noted in blue

Deliverables Timeliness

One Day E-Site Report – Received/Not Received

30 day station package submission – Received/Not Received

Annual Inspection Checklist: Received/Not Received – Please submit

Transmittal letter: Received/Not Received – Please submit

Annual Inspection Station Specific Requirements:

The following Requirements were completed this year:

eSite Report:

Data Downloads:

Levels:

Bench Mark Descriptions/Recovery Notes:

Bench Mark Diagram:

Station “To Reach” Statement:

GPS Documentation:

Sensor Elevation Diagram:

Digital Photographs:

Future Work Requests: Work to be accomplished by the contractor or FOD will be documented in the next year’s project instructions.

For contracts and future work requests:

Task Manager Initials - Agree _____ Disagree _____

ADDITIONAL COMMENTS & RECOMMENDATIONS