

NGDA Dataset Report

Official NGDA Title: Sea Levels Online: Sea Level Variations of the United States Derived from National Water Level Observation Network Stations

Metadata Record Title: Sea Levels Online: Sea Level Variations Of The United States Derived From National Water Level Observation Network Stations

A-16 NGDA Theme: Water - Oceans and Coasts

Executive NGDA Theme Champion(s):

Name: Margaret Davidson

Agency: DOC-NOAA

Email: margaret.davidson@noaa.gov

Theme Lead(s):

Name: Tony LaVoi

Agency: NOAA

Email: tony.lavoi@noaa.gov

Dataset Manager(s):

Name: Armin Pruessner

Agency: NOAA

Email: armin.pruessner@noaa.gov

Metadata:

Registration Status: Complete

Registered on 12/5/2014

GeoPlatform Link*: <http://www.geoplatform.gov/node/243/5db48223-782d-489d-af1f-37e337c4a715>

Data.gov Metadata Link*: <http://catalog.data.gov/harvest/object/23f0aa6a-7a2c-44f7-aa5f-d8c153ba73d3/html>

*If the metadata has been updated and reharvested after publication of this report, the link may no longer be valid. The dataset may be searched for manually in Data.gov or GeoPlatform.gov.

NGDA Lifecycle Maturity Assessment (LMA) Report

Time Frame:

Baseline assessment responses include dataset activities from 1998 to 2015

LMA Submission:

Status: Complete

Date: 11/16/2015

Extension Requested: No

LMA Reviewer(s):

Supervisor: Andrea Hardy andrea.hardy@noaa.gov

Theme Lead: Tony Lavoie tony.lavoie@noaa.gov

Executive Champion: Did not review

SAOGI*: Did not review

Other: Anne.Ball@noaa.gov

LMA Verifier:

Name: Andrea Hardy

Email: andrea.hardy@noaa.gov

Attachments:

To get access to any attachments referenced in the report, email the LMA Help Desk at NGDA_LMA_help@fgdc.gov. Please use the subject "Dataset Report Attachment(s)" and indicate the associated official NGDA title.

*Senior Agency Official for Geospatial Information (SAOGI)

Lifecycle Maturity Assessment (LMA) Summary

Overall Maturity:

Mature; Consistent

General Questions: 100%

Optimized; Established

Stage 4 - Access: 100%

Optimized; Established

Stage 1 - Define/Plan: 80%

Mature; Consistent

Stage 5 - Maintain: 69%

Managed; Predictable

Stage 2 - Inventory/Evaluate: 100%

Optimized; Established

Stage 6 - Use/Evaluate: 89%

Mature; Consistent

Stage 3 - Obtain: 100%

Optimized; Established

Stage 7 - Archive: 33%

Transition; Transformation

NGDA Dataset Maturity Definitions:

How To Calculate Maturity: https://www.geoplatform.gov/sites/default/files/How_to_Calculate_Maturity.pdf

Maturity	Maturity Characteristics for All Lifecycle Stages
Optimized; Established Rank = 5	Dataset meets virtually all business needs of all users. The dataset is considered authoritative by owners and secondary users. It is curated across all stages of the approved lifecycle. Future needs are defined on a regular basis and resources for addressing both current and future business requirements are available.
Mature; Consistent Rank = 4	Dataset meets all the business needs of the primary owner and most of the secondary users. The dataset is curated and used as authoritative by the primary owner. Dataset is used widely by secondary users actively engaged in sustaining the dataset. Future needs are identified and steps are planned to address these. All stages are supported and reviewed on a recurring basis. The dataset is well managed in relation to the approved lifecycle.
Managed; Predictable Rank = 3	Dataset meets a significant number of the business needs of the primary owner and is widely used as an authoritative resource by secondary users. Benchmark activities are occurring in at least four of the approved lifecycle stages. Management practices in relation to the approved lifecycle is moderate but consistent. Dataset is integrating changing business requirements in lifecycle stages impacting overall maturity.
Transition; Transformation Rank = 2	Dataset meets business needs of the primary owner and has moderate use by secondary users. Benchmark activities are occurring in at least three stages. Efforts to integrate funding, include partners, and obtain data are not supported in a sustained manner. Management practices in relation to the stages of the approved lifecycle is limited.
Planned; Initial Development Rank = 1	Dataset limited in meeting business needs of the primary owner. Benchmark activities in the approved lifecycle are just starting to consider secondary uses, partnerships are forming to support additional dataset uses. Dataset development is in a very early stage. Minimal or limited management against the benchmarks in the approved lifecycle.
No Activity Rank = no activity	Dataset meets project or local business needs of the primary owner, secondary or additional uses or users were not considered, not recognized as an authoritative data or is part of a similar dataset. Not managed to any of the benchmarks in the approved lifecycle.

General Questions for All Stages

1) Is there a recurring process to obtain funding for all lifecycle stages of this dataset?

Answer: Funding support is part of agency budget on a recurring basis, funding is consistent and tied to business processes, and supports all lifecycle stages.

Justification Comment:

Attachment(s): 0

Sea level trends is a derived product from underlying water level data collected.

Funding for all lifecycle stages of CO-OPS products, including PORTS® (Physical Oceanographic Real-Time System) and the National Water Level Observation Network (NWLON), is included in the agency's annual budget request submitted by the President to Congress. PORTS and NWLON are the primary programs to collect CO-OPS oceanographic data. All core operations are supported through CO-OPS annual appropriation from Congress. See Page 128 of the FY 2016 President's Budget Request (link below) for a description of NOAA's Tides and Currents Program. Page 121 includes a funding request for Navigation, Observations, and Positioning, which includes all CO-OPS core operations.

http://www.corporateservices.noaa.gov/~nbo/fy16_bluebook/NOAA_FY16_CJ_508compliant_v2.pdf

Operation and Maintenance of PORTS is funded through reimbursable agreements with partners. If a partner does not pay, then the PORTS shuts down. However, the functions of data ingestion, analysis, QA/QC, and product dissemination as they relate to PORTS are funded with appropriated money.

2) Is there a process in place to ensure that open government and transparency guidelines are followed in all lifecycle stages for this dataset?

Answer: Process is published as appropriate with respect to sensitivity requirements, process is transparent, published appropriately.

Justification Comment:

Attachment(s): 0

Management of this dataset follows all scientific data management per the NOAA Administrative Order "NAO 202-735D: Scientific Integrity." NAO 202-735D outlines how NOAA complies with Open Government and Transparency requirements for all scientific data (http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_202/202-735-D.html). All of CO-OPS data are open to the public and, where appropriate, CO-OPS uses the Federal Register to notify the public. All of COOPS' technical reports and papers are peer reviewed, all scientist take the government ethics courses, and CO-OPS continually makes the public aware of applied research findings. CO-OPS does not conduct nor fund basic research, etc. nor does CO-OPS set government policy.

In addition, CO-OPS is one of the early adopters of the Whitehouse Digital Government initiative via our Tides and Currents Website (<http://tidesandcurrents.noaa.gov/>). Using responsive web design, CO-OPS products and data are easily accessible in a variety of formats via a variety of platforms (desktop, tablet, and mobile). This includes the Sea Level Trends website (<http://tidesandcurrents.noaa.gov/sltrends/sltrends.html>).

CO-OPS provides the public with the ability to provide input and requirements via multiple pathways. The Tides and Currents Website ForeSee survey allows for direct input by the public, and new requirements, such as requests for new stations and sensors, are solicited via the Program Management Team (PMT), who engage stakeholders at various meetings and are in touch with the

local communities. See the responses to Questions 4 and 5 for additional information.

3) Are there processes and tools in place so that staff are sufficiently knowledgeable to ensure a continuity of the dataset for all stages of the lifecycle, especially during staffing transitions?

Answer: Processes and tools to ensure dataset continuity are in place and implemented for all lifecycle stages.

Justification Comment:

Attachment(s): 0

CO-OPS has a rigorous internal documentation repository (Reliable Operating System - ROS), which was developed to 1) Understand & Manage Capacity, 2) Ensure Accountability & Management Controls, 3) Maintain Core Expertise, 4) Document Processes & Procedures, 5) Ensure Reliable Program Planning & Execution, and 6) Ensure Quality Products & Services.

Currently (Feb. 2015), the repository contains almost 700 SOPs, user manuals, publications, and other documents used by the organization. The repository contains sufficient information to provide continuity of the dataset and operations and is used to provide employees with tools and, standards, guidelines and policies for managing the data. Many of the SOPs in place for processing water level data are applicable. SOPs specific for the Sea Level Trends product includes 7.3.A.4.8_Creating_Sea_Level_Trends_and_Reports.pdf.

Finally, CO-OPS has developed a "Knowledge and Expertise Enhancement Program (KEEP)". KEEP is a strategic tool that helps CO-OPS fulfill mission objectives by aligning training and development opportunities with individual career goals while maintaining corporate expertise. A training specifically for Sea Level Trends is "KEEP 201 Sea Level Variations"

There are also a number of technical publications on the Tides and Currents website, including http://tidesandcurrents.noaa.gov/publications/Understanding_Sea_Level_Change.pdf and Sea Level Variations of the United States 1854-2006 http://tidesandcurrents.noaa.gov/publications/Tech_rpt_53.pdf.

STAGE 1 - Define/Plan

4) Are user and business requirements defined and formalized?

Answer: A recurring process is in place, including defining new partner and stakeholder business needs as they arise, and is fully implemented.

Justification Comment:

Attachment(s): 0

Sea level trends calculations depend on a minimum of 30 years of water level data. For US coastal waters, CO-OPS is the authority and collects data at hundreds of locations. User requirements are collected and defined as in the ODIN assessment. The metric selection is driven in large part by the ODIN assessment response for water level data. New sea level trend data is added as stations acquire the necessary 30 years of data and are processed.

Data for global stations are retrieved from the Permanent Service for Mean Sea Level (PSMSL) <http://www.psmsl.org/>. PSMSL works with many other organizations and has been responsible for the collection, publication, analysis and interpretation of sea level data from the global network of tide gauges.

5) How are partners/stakeholders involved in the requirements collection process?

Answer: Not Applicable (NA).

Justification Comment:

Attachment(s): 0

Sea level trend data depends on a minimum of 30 years of underlying water level data. Partners/stakeholders are not directly engaged in requirements analysis for sea level trends, but are

involved in terms of defining requirements for new water level station locations. See the ODIN assessment for more details on how new locations are determined. The process for engaging partners/stakeholders for water level stations is directly applicable for Sea Level Trends data sets. For ODIN (collecting the underlying water level data) a metric of "A recurring process exists for gathering partners/ stakeholders requirements is in place and is in the beginning stages of implementation" was identified.

6) Is there a quality assurance process for the dataset?

Answer: Quality assurance published as appropriate with respect sensitivity requirements.

Justification Comment:

Attachment(s): 0

CO-OPS has a rigorous quality assurance process to identify if data meet QC standards and are ready for dissemination. Documented processes are in place for water level data sets (which are used to generate sea level trends). Additional SOPs are in place specifically for sea level trends. As of Feb. 26, 2015, 77 SOPs with some element of quality assurance are available in CO-OPS ROS Library (SOP repository). Sample relevant SOPs for sea level trends include:

7.3.A.4.8_Creating_Sea_Level_Trends_and_Reports.pdf

7.1.0.0_Guide_to_Declaring_a_Newly_Installed_Water_Level_Station_Operational.pdf

7.1.80.0_Guide_to_Declaring_a_PORTS_Operational_Update_05-2014.pdf

6.5.1.1.10_CORMS_Methods_For_Reviewing_Real-Time_Data.pdf

6.1_Review_O&M_R&Rs/6.1.1.4_CORMS_RandR.pdf

7) Is there a process to evaluate the sensitivity, privacy, and confidentiality of this dataset?

Answer: Sensitivity, privacy, and confidentiality evaluations fully implemented, reviewed and updated on a recurring basis.

Justification Comment:

Attachment(s): 0

CO-OPS PORTS and NWLON IT systems are the primary systems to collect, process, quality-control, and disseminate CO-OPS oceanographic data. The system is classified as "Sensitive But Unclassified".

CO-OPS has performed a "Privacy Threshold Analysis" for CO-OPS' PORTS and NWLON IT Systems (6205)" in 2013.

In addition, CO-OPS completed a "FIPS 199 Security Categorization" for our PORTS and NWLON IT Systems (NOAA6205) in 2012.

Each of these assessments are reviewed annually for any changes in security status.

8) Are defined data standards used in collecting, processing, and/or rendering the data?

Answer: Standards fully implemented documented and published as appropriate.

Justification Comment:

Attachment(s): 0

Sea level trends depends on the collection and processing of underlying water level data. Many of the SOPs and standards in place are applicable for sea level trends.

CO-OPS maintains an internal repository of over 600 SOPs, manuals, and operating procedures in our internal Reliable Operating System (ROS) Library. These cover the full breadth of CO-OPS activities related to collecting, processing and rendering/disseminating our time

series data and metadata. In addition, CO-OPS maintains a publicly accessible Field Library (<http://tidesandcurrents.noaa.gov/fieldlibrary/Welcome>), for use by partners and associated to describe standard operating procedures, manuals, and standards. Together with the Manuals and Standards available on our Tides and Currents Website (<http://tidesandcurrents.noaa.gov/pub.html#Manuals%20and%20Standards>), all documentation has been reviewed, verified and accepted and covers the full breadth of our collection, processing, and dissemination activities.

STAGE 2 - Inventory/Evaluate

9) Is there a process for determining if data necessary to meet requirements already exist from other sources (either within or outside the agency) before collecting or acquiring new data?

Answer: Process for determining appropriate data is being reused fully implemented, reviewed, and updated on a regular basis.

Justification Comment:

Attachment(s): 0

Sea level trends calculations depend on a minimum of 30 years of water level data. For US coastal waters, CO-OPS is the authority and collects data at hundreds of locations. These underlying water level time series are used for calculating sea level trends and are reused within the sea level trends product.

Data for global stations are not collected by CO-OPS but are retrieved from the Permanent Service for Mean Sea Level (PSMSL) <http://www.psmsl.org/>. PSMSL works with many other organizations and has been responsible for the collection, publication, analysis and interpretation of sea level data from the global network of tide gauges.

STAGE 3 - Obtain

10) Is there a process for obtaining data in relation to this dataset?

Answer: Process is fully implemented, reviewed and updated on a regular basis.

Justification Comment:

Attachment(s): 0

CO-OPS is the authoritative source for accurate, reliable, and timely water-level and current measurements that support safe and efficient maritime commerce, sound coastal management, and recreation and has been collecting oceanographic data for over 200 years. Sea level trends are calculated based on stations having collected a minimum of 30 years of data.

Requirements for any new stations or data types collected follow the formal process as defined in responses to Questions 4 and 5. Customer requests are evaluated based on need and if the data already exist elsewhere. In addition, COOPS also performs a formal gap analysis every 5 years or so for water level stations (formal document). The gap analysis process involves extensive outreach and engagement of partners/stakeholders in order to determine a prioritized list of new station locations. Finally, for currents data, a formal 5 year plan has been developed to prioritize new station locations. This plan is updated and revised annually based on various factors, including partner/stakeholder input. The following technical reports are related to the gap analysis:

- NOAA Technical Report NOS CO-OPS 074 - Gap Analysis of the Great Lakes Component of the National Water Level Observation Network (NWLON)
 - NOAA Technical Memorandum NOS CO-OPS 048 - A Network Gaps Analysis for the National Water Level Observation Network - Updated Edition (Sept 2014)
-

11) Is the metadata in a FGDC endorsed geospatial metadata standard?

Answer: Metadata is available in a format endorsed by the FGDC, it fully describes the dataset and

provides all the information required to make the dataset discoverable, accessible, and usable.

Justification Comment:

Attachment(s): 0

Metadata are written to the FGDC Content Standard for Digital Geospatial Metadata (CSDGM) - version FGDC-STD-001-1998. In addition, these metadata records are provided in a basic ISO standard version via a CSDGM to ISO transform available at the NOAA Data Portal (data.noaa.gov) and at the U.S Government's open data portal (www.data.gov). Keyword tags and associated information has been entered and to make it discoverable as an NGDA and usable.

12) How complete is the geographic coverage as defined in the requirements for the dataset?

Part 1 Answer: Business requirements for cyclic updates identified and a process is in place.

Part 2 Answer: Dataset has presently attained the greatest geographic coverage as defined by the current requirements or roughly 100%.

Justification Comment:

Attachment(s): 0

Sea level trend data is available for over 100 US stations and for over 200 global stations. New stations are added as the 30 year data requirement is met. There is a need for sea level trend data in western and northern Alaska, which is the only region presently not covered. Prudhoe Bay will likely be added at some point in 2015.

STAGE 4 - Access

13) Do you have a process for providing users access to the data in an open digital machine readable format?

Answer: User access process is fully implemented, data is available, process is reviewed and updated on a recurring basis.

Justification Comment:

Attachment(s): 0

Sea level trend data are available via the <http://tidesandcurrents.noaa.gov/sltrends/sltrends.html> website. The site allows users to download data as KML, CSV, or text files and allows the data to be exported in PDF format.

For questions regarding data access, users are referred to our User Services Team (UST), who provide users with additional information regarding data access. In addition, users can contact CO-OPS via <http://tidesandcurrents.noaa.gov/contact.html> for additional questions.

STAGE 5 - Maintain

14) Is there a maintenance process for updating and storing the dataset?

Answer: Dataset maintenance process is being implemented.

Justification Comment:

Attachment(s): 0

CO-OPS has a well-defined process for updating and storing the underlying raw water level data sets. See the SOPs and information listed in the ODIN assessment.

Sea level trends are calculated using the process defined in the SOP "7.3.A.4.8_Creating_Sea_Level_Trends_and_Reports.pdf". The SOP is being updated based on IT changes (how the data are stored, new web application released, etc.), however the actual process for calculating trends is mature (used for 10 years).

15) Is there an error correction process as part of dataset maintenance?

Answer: Error correction process established.

Justification Comment:

Attachment(s): 0

Sea level trends are calculated from underlying water level data. As such, it is a derived product, which depends on the underlying data. CO-OPS continually reviews the underlying data for vertical stability of the bench marks and the sensors. It often takes decades of data to establish vertical instability. When instability is found and quantified, the data products are corrected and new sea level trends computed. SOPs for determining vertical stability exist and users are notified whenever changes are made to the web product.

STAGE 6 - Use/Evaluate

16) Is there a process to determine if the dataset meets user needs?

Answer: Process is fully implemented and repeated on a recurring basis.

Justification Comment:

Attachment(s): 0

Sea level trend data are calculated from a minimum of 30 years of underlying water level data. Trend data is made available for stations that meet the 30 year data requirement. The underlying water level data are collected based on user need and have a formal process to determine need. See the ODIN assessment response for details.

17) Is there a process to provide users information on how to access and properly use the dataset?

Answer: Process implementation started for access and proper use.

Justification Comment:

Attachment(s): 0

The CO-OPS Sea Level trends product is described in more detail at <http://tidesandcurrents.noaa.gov/sltrends/sltrends.html>. A set of FAQs is available at the bottom of the page. Data are available as plots, text, csv, and image format. In addition, CO-OPS also provides estimates of uncertainty in the derived sea level trends for each station, which may aid in proper use of the data.

In some instances, usage of the data is very specific. In this case, we generally refer users to our User Services Team (UST), who is responsible for providing detailed and customized responses to user inquiries. Users may contact UST via phone, email or web (<http://tidesandcurrents.noaa.gov/contact.html>). The web contact form is broken down by product and areas of interest.

18) Are the business processes and management practices assessed to meet changing technology?

Answer: Assessment process is fully implemented for taking advantage of changing technology, process is reviewed on a recurring basis.

Justification Comment:

Attachment(s): 0

CO-OPS has a formal process for assessing and responding to changes in technology and customer needs. The CO-OPS Requirements Request (CRR) process is a formal project lifecycle which is initiated in an annual project planning process. CRRs may be submitted based on formal requests from customers (see responses in Questions 4 and 5), feedback via the ForeSee survey on CO-OPS Tides and Currents Website (<http://tidesandcurrents.noaa.gov/>) or via internal mechanisms. Projects are evaluated based on IT, strategic goals, and customer needs. To date (March, 2015), CO-OPS has completed or initiated over 190 formal CRRs using this process.

CO-OPS also has a formal Web Advisory Committee (WAC) that meets regularly to review technology, data dissemination mechanisms, products, and to make recommendations on new technologies and projects, in alignment with CO-OPS strategic goals. The Information Systems Division (ISD) within CO-OPS also has formal management/technical boards (Engineering Control Review Board-ECRB and Change Control Board-CCB) to assess changes in technology.

Recent changes in technology have resulted in CO-OPS developing and implementing formal public APIs and web services such as the services available at <http://opendap.co-ops.nos.noaa.gov/>, as well as the CO-OPS Data API (<http://tidesandcurrents.noaa.gov/api/>). In addition, based on requirements coming from both internal and external recommendations, CO-OPS has recently initiated a GIS architecture project to develop a formal GIS platform to disseminate CO-OPS GIS data in the form of formal GIS services (WMS, WFS, etc.) and to develop more formal analysis capabilities for internal use.

STAGE 7 - Archive

19) Is there an archiving process for the dataset?

Answer: Archival and/or disposition processes are in development.

Justification Comment:

Attachment(s): 0

Sea level trends are calculated from underlying water level time series data (monthly means). Although the sea level trend values (i.e. the trend is 3.15mm/year for a given station) are not archived, the underlying water level time series data will be. All sea level trend values disseminated are reproducible if the underlying monthly mean time series data is archived (which is planned). A formal process is documented to calculate the trends. See the ODIN response to Question 19.

Although data are not all formally archived at a data center, CO-OPS has a formal maintenance and backup process in place. All databases are backed up on a regular schedule, with backup files ("database dump files") written to tape. Tape backups are moved offsite for archival purposes.