CO-OPS PARTNERSHIP POLICY:

NAVIGATION SERVICES PARTNERSHIPS THROUGH NOAA PORTS®

Purpose of this document:

This document outlines parameters for potential partners related to real-time oceanographic and meteorological data used for critical decision making, supporting safe and efficient navigation in and around U.S. seaports. This document provides overarching information for external stakeholders interested in entering into a partnership with NOAA's Center for Operational Oceanographic Products and Services (CO-OPS). This partnership type addresses local stakeholder needs related to navigation. Outcomes from this partnership will result in the establishment of, or enhancements to, a local or regional:

- **Physical Oceanographic Real Time System (PORTS®) (https://tidesandcurrents.noaa.gov/ports.html) and the associated products and services**

PORTS® is a domestic cost-shared program between NOAA and the maritime community (local or regional system sponsors) that provides an integrated system of oceanographic and meteorological sensors serving mariners with real-time information about environmental conditions in seaports.

With PORTS®, mariners are able to access observations: *oceanographic* (water levels, currents, bridge air gap, water temperature, salinity, waves) and *meteorological* data (wind, visibility, air temperature, relative humidity, barometric pressure). Predictions for tides and tidal currents are also available. All PORTS® observations and predictions are quality controlled by NOAA 24 hours a day, 365 days a year, to ensure that suspect data is not disseminated. Where they are established, PORTS® information is publicly available for both commercial and recreational users to access real-time data anytime, anywhere.

PORTS® come in a variety of sizes and configurations, because local users identify what real-time information they need, and where it should be sited, in order to improve the safety and efficiency of maritime commerce in the area. Some PORTS® start with just one or two stations and then local partners choose to add more as stakeholders and users learn how to use the system, gain confidence in the data, and directly realize the benefits. A single PORTS® may service one or more U.S seaports, depending on the geography of the area and the local maritime stakeholders that are able to partner with NOAA to establish the PORTS®.

PORTS® promotes safer and more efficient marine navigation by (1) providing data in near real-time (i.e., measurements taken every 6 minutes and disseminated within 18 minutes) to inform users of actual conditions, and (2) integrating a variety of environmental parameters on

one website, eliminating the need to go to multiple sources for different observation types. The ability to get a comprehensive and easily understood view of the operating environment is particularly critical on the bridge of a vessel, where many issues can require the attention of the crew at the same time. Since its initial deployment in 1991, PORTS® has grown exponentially, incorporated new sensor technologies needed by the maritime community, and built a solid reputation as a highly trusted source for real-time oceanographic and meteorological information to support safe and efficient maritime commerce.

Would partnership stations of this type be called an NWLON station? No. National Water Level Observation (NWLON) stations are NOAA-funded water level stations, where the agency has made a long-term commitment to the maintenance of high quality water level observations in a specific geographic location. All PORTS® water level stations are installed and expected to adhere to NOAA NWLON standards and specifications, given that they are used in real-time to support safe and efficient marine navigation.

*Data from NWLON stations operating in areas where a PORTS® is already established or planned to be established, can be integrated into the system at no cost to local system sponsors. Water level and meteorological observations from NWLON stations in the vicinity of a PORTS® are supplemental and increase the density of available observations in and around various seaports.

What are some considerations before entering into this type of partnership? Observations from PORTS® partnerships must directly support marine navigation. This partnership type requires a commitment and resources by both NOAA CO-OPS and the local system sponsor(s) in order to obtain maximum collaborative benefits. The financial commitment from the partner for operating and maintaining associated PORTS® stations for a minimum of five years should be a *major consideration* before entering into this type of partnership. General partnership classifications and requirements for partners are listed in Section B below.

What sort of entities could be considered as a PORTS® partner or local system sponsor? Local PORTS® partners are diverse and typically consist of pilots, port authorities, marine exchanges, state agencies, bridge authorities, private industry, and even other federal agencies (e.g., U.S. Navy and USACE).

A. PORTS® REAL TIME DATA PARTNERSHIP POLICY

Under a PORTS® partnership, real time oceanographic (water levels, currents, bridge air gap, water temperature, salinity, waves) and meteorological data (wind, visibility, air temperature, relative humidity, barometric pressure) is collected and transmitted over the Geostationary Operational Environmental Satellite (GOES) or other data communication system, ingested into the CO-OPS database, then displayed in *near real-time* by CO-OPS through the NOS Tides and Currents Website and associated data and metadata APIs ("Application Programming Interface" i.e., web services).

What are the Products and Services that can be expected from this Partnership Type? Data Products provided through this Partnership includes:

- Real-time oceanographic & meteorological data on the Tides and Currents Website
- Real-time oceanographic & meteorological data accessible through a Data Application Programming Interface (API)
- Real-time oceanographic & meteorological data on specific PORTS® web pages & portals (in graphical and text form, mobile capable and via toll-free telephone)
- CO-OPS verified water level products
- Published National Ocean Service (NOS) Tidal Datums
- Benchmark sheets
- Harmonic constituents and tide predictions
- Tidal current predictions
- Data availability and monitoring on the NOAA Coastal Inundation Dashboard and associated products and services (water level stations only)
- Data availability and monitoring on Tsunami Capable Tide Stations page and associated products and services (water level stations only)
- Sea level trends (if 30 years of data exist)

How will the data for this Partner station be displayed?

*(**Please note that some urls below are shown as examples and data display is dependent on sensor and station types integrated into a specifically tailored PORTS®)*

- Real-time PORTS® partnership stations will be available through the local PORTS® pages listed HERE (example: https://tidesandcurrents.noaa.gov/ports/index.html?port=ny) and through other pages and formats listed below *(varies by data type)*:
    - https://tidesandcurrents.noaa.gov/ports/ports.html?id=8519483&mode=show_all
    - https://tidesandcurrents.noaa.gov/ports/ports.html?id=jx0601
    - https://tidesandcurrents.noaa.gov/ports/ports.html?id=cb1001&mode=composite
    - https://tidesandcurrents.noaa.gov/ports/ports.html?id=8519461&mode=show_all
    - https://tidesandcurrents.noaa.gov/ports/ports.html?id=8638610&mode=show_all
    - https://tidesandcurrents.noaa.gov/ports/textscreen.shtml?port=cs
    - https://mobile.tidesandcurrents.noaa.gov/ports/mobile.shtml?port=cs

- Real-time PORTS® partnership stations will be ingested into CO-OPS' database and accessible through Tides and Currents:
    - Water Level-Station Selection Page in near real time (https://tidesandcurrents.noaa.gov/stations.html?type=Water+Levels).
    - Meteorological, Water Temperature and Conductivity Station Selection Page in near real time (https://tidesandcurrents.noaa.gov/met_info.html)
    - Active Currents Station Selection Page (https://tidesandcurrents.noaa.gov/cdata/StationList?type=Current+Data&filter=active)
- Real time observations and predictions available through various CO-OPS Web Services (Data API, Metadata API, GIS Data Portal, Google Earth etc.)
- PORTS® data (for water level stations) will be listed on the following webpages: Harmonic Constituents, Datums, Benchmark sheets, Tide predictions, and Sea Level Trends (if 30 years of data exists).
- Tidal Current Predictions
- Water level stations will be viewed through the Coastal Inundation Dashboard https://tidesandcurrents.noaa.gov/inundationdb/
- Water level stations will be viewed through the Tsunami Data Monitoring Page https://tidesandcurrents.noaa.gov/tsunami/

B. SPECIFIC REQUIREMENTS RELATED TO PORTS® PARTNERSHIPS?

Who manages and maintains the stations integrated in a local PORTS®?
NOAA enters into three general categories of PORTS® partnerships. Regardless of the partnership category, terms of the partnership are codified under a formal Memorandum of Agreement (MOA) that is signed by both NOAA and the local sponsor.

NOAA Managed - A reimbursable cooperative agreement between NOAA and the local partner(s) is established and the *partner transfers funds to NOAA* so that NOAA manages all aspects of PORTS® installation, enhancement, maintenance, and recapitalization to NOAA standards and requirements.

Partner Managed - An unfunded "data sharing" cooperative agreement between NOAA and the local partner(s) is established and specifies that the partner(s) or the partner using a knowledgeable contractor - that possess the expertise to manage all aspects of a PORTS® installation, enhancement, maintenance, and recapitalization. The partner(s) is responsible for installing and maintaining the PORTS® to NOAA standards and requirements. Under this partnership category, *no funding is transferred to NOAA*. This type of agreement is also required when the partner receives a federal grant to establish their PORTS®, as appropriations law prohibits those funds from being transferred to NOAA.

Hybrid - A reimbursable cooperative agreement between NOAA and the local partner(s) is established and specifies which party is responsible for specific aspects of PORTS® installation, enhancement, maintenance, and recapitalization, including installing and maintaining the PORTS® to NOAA standards and requirements. Some partners have the expertise and desire to manage some of the work, but not all.

Services provided by NOAA CO-OPS using federally appropriated funds:

- Data Management and Dissemination Activities
- Real-time 24/7/365 monitoring and Quality Assurance/ Control (QA/QC) of data
- Data archival at National Centers for Environmental Information (NCEI)
- Partner Account Management Activities
- Observation Platform Management Activities
- National Standards and Technology Transition and Enhancement Activities

Services covered by local/regional sponsor funding support:

- Labor for site reconnaissance and associated travel costs
- Purchase of oceanographic sensors and mounting infrastructure, data transmission equipment, spare parts, supplies and associated shipping costs
- Purchase and establishment of support platforms (pile structures, I beams, etc.)
- Labor for new station/sensor installation and associated travel costs
- Recurring data communication costs (GOES, IP modem, Iridium, Telephone)
- Labor for ongoing scheduled maintenance and associated travel costs
- Labor for ongoing unscheduled maintenance and associated travel costs
- Sensor, equipment, and supplies recapitalization
- Labor for major station repairs and associated travel costs
- Labor for station relocations and associated travel costs
- Labor for removal of equipment, site restoration, and associated travel costs
- Permitting and property use fees

Additional Requirements

- Equipment
    - Sensors at all PORTS® stations, which are used for navigation and critical decisions must contain NOAA/CO-OPS approved sensors and data collection configuration with capabilities for 6-minute data averaging
    - Data will be stored locally in Data Collection Platform (DCP) and transmitted
- Real-time Data Transmission pathways to CO-OPS:
    - GOES (with IP cellular modem back-up preferred)
    - Stand alone IP modem
    - Iridium

    - All of the above must meet CO-OPS message encoding and formatting requirements
- Data being utilized for navigation purposes must be transmitted and disseminated in real-time with as short a latency as reasonable. The maximum acceptable latency is 18 minutes.
- Vertical stability for real-time water level observation requirements:
    - Water level sensors need to be installed on a stable platform or structure (e.g. a concrete pier or bulkhead).
    - A network of at least 5 bench marks of Class B or higher
    - Leveling equipment and techniques meet 2nd order class I standards as defined by NOAA.
    - For stations or bench mark networks that can not meet NOAA vertical stability requirements, a continuous Global Navigation Satellite System (cGNSS) must be installed at the station
    - Leveling surveys must be performed annually and after major events. They must always include the water level sensor and PBM (in addition to the requisite number of additional bench marks) in the level run.
    - For new or upgraded stations, a check of levels should be done after two months but no more than six months after installation.
- For all stations and data types, annual station maintenance must be performed. Proper documentation must be completed following the station visit.
- Stations and systems should be designed and maintained to minimize data loss during extreme events, and to ensure that the full range of data is recorded.

For more details about requirements for real-time station requirements, please see: *NOAA CO-OPS Environmental Measurement Systems Sensor Specifications and Measurement Algorithms*