CO-OPS WATER LEVEL PARTNERSHIP POLICY:

COASTAL HAZARDS PRODUCT AND SERVICES PARTNERSHIPS

Purpose of this document:

This document outlines partnership parameters for real-time water level observations to enhance Center for Operational Oceanographic Products and Services (CO-OPS) coastal hazards decision support products. Specifically, these partner observations would be used to increase the density and interoperability of water level observations available to support situational awareness and decision support applications related to coastal hazard event response (e.g., coastal storms, hurricanes, and tsunamis). Data may also be used to track changing water levels as it relates to sea level rise/high tide flooding to support communities understanding coastal flood risk. This document provides overarching information for external stakeholders interested in entering into a partnership with CO-OPS related to real-time coastal hazards and inundation decision support. These partnerships will result in enhancements to the following existing national-scale coastal hazard product and services:

- Coastal Inundation Dashboard (https://tidesandcurrents.noaa.gov/inundationdb/) and associated products and services
- Tsunami Capable Tide Stations (https://tidesandcurrents.noaa.gov/tsunami/) and associated products and services

Would a partnership station be called a National Water Level Observation Network (NWLON) station? No, National Water Level Observation Network (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. Coastal Hazards partner stations will increase the density of water level observations that help communities understand the risk of coastal inundation from coastal storms, tsunamis, increased high tide flooding, and sea level rise. Water level stations used for coastal hazards decision support products are not required to meet all the requirements of an NWLON station. For example, coastal hazards partner stations would not need to meet sensor type and redundancy, station hardening and location out of floodways or annual leveling requirements.

What are some considerations before entering this type of Partnership? Water level data should be available real-time at time intervals suitable for coastal hazard response and situational awareness. Ideally, a partner should demonstrate a commitment - including associated funding - to install and maintain the water level station for multiple

years (ideally 5+ years). Coastal hazard-enabled water level stations should aim to be available to CO-OPS in real-time, 24 hours - 7 days a week through web services.

A. COASTAL INUNDATION DASHBOARD WATER LEVEL PARTNERSHIPS

This partnership pertains to water level data that is collected in real-time by a partner and available to CO-OPS over web services for display in the Coastal Inundation Dashboard. These water level stations require a geodetic tie to the National Spatial Reference System (NSRS) in order to establish a real-time alerts capability when water level is elevated relative to defined flood thresholds (minor, moderate, major). These stations do not require annual leveling to maintain vertical accuracy and stability standards.

How will the data for this Partner station be displayed?

- These real-time data are made available on the Coastal Inundation Dashboard (https://tidesandcurrents.noaa.gov/inundationdb/).
- A disclaimer will be included on the station pop up page below the water level plot noting that these data do not meet NOS standards for navigation or production of NOS tidal datums.
- The water level station data and products are **NOT** available on the Tides and Current Website map, nor listed on the following webpages: Water Levels , Harmonic Constituents, Datums, Benchmark Sheets, Tide Predictions, and Sea Level Trends

What are the services that can be expected from this partnership type?

In-kind services provided by CO-OPS include:

- Technical assistance with water level data collection, including establishing a geodetic tie to the NSRS
- Technical assistance with metadata reporting
- IT support for data display in relevant products via web services

B. TSUNAMI CAPABLE WATER LEVEL PARTNERSHIPS

This partnership pertains to real-time water level data that is collected by a partner and transmitted over web services for display in the Tsunami Capable Tide Stations applications; these data are not ingested into the CO-OPS database. Water level stations are supplemental data to the NWLON tsunami enabled stations. They require no connection to the National Spatial Reference System to support a real-time tsunami mission support and are displayed on station datum. An example of this type of partnership water level station is at Craig, AK, displayed on CO-OPS Tsunami Capable

Tide Stations application.
(https://tidesandcurrents.noaa.gov/tsunami/plot.html?stnid=9450552&name=Craig).

How will the data for this Partner station be displayed?

- The station data are only available on the Tsunami Capable Tide Stations application webpage (https://tidesandcurrents.noaa.gov/tsunami/#).
- A disclaimer will be noted on the station pop up page below the water level plot. For example, “These data are measured by NOAA's National Tsunami Warning Center (NTWC). They have not been subjected to the National Ocean Service's quality control or quality assurance procedures, and do not meet the criteria and standards of official National Ocean Service data. Data collected by NTWC are provided relative to a station datum. Tidal datums are not available at this location. They are released for limited public use for tsunami observations. For more information on the NTWC, visit the NTWC website.”
- The station data and products are **NOT** available on the Tides and Current Website map nor listed on the following webpages: Water Levels , Harmonic Constituents, Datums, Benchmark Sheets, Tide Predictions, and Sea Level Trends.

What are the services that can be expected from this partnership type?

In-kind services provided by CO-OPS include:

- Technical assistance on water level data collection
- Technical assistance on metadata reporting, if needed.
- IT support for data display in relevant products via web services

C. WHAT ARE THE SPECIFIC REQUIREMENTS FOR COASTAL HAZARDS PRODUCTS AND SERVICES WATER LEVEL PARTNERSHIP STATIONS

- The partner is responsible for the acquisition of all station components and the installation of the station and instrumentation, as well as ongoing operations and maintenance (O&M) and associated metadata reporting to CO-OPS. CO-OPS typically seeks partnerships that will have longer periods of real-time data availability. Ideally, a partner can demonstrate a commitment - including associated funding - to maintain the water level station for multiple years (ideally 5+ years).
- CO-OPS does not require a signed formal data sharing Memorandum of Agreement (MOA) for this type of partnership, however CO-OPS will send an email to the partner when CO-OPS begins data display through one or more applications.

- The station is **NOT** required to have an approved redundant data collection platform and backup water level sensor, but it would be beneficial for real-time coastal hazards mission support.
- A real-time Coastal Hazard Partnership water level gauge must comply with the following:
    - Data must be transmitted and disseminated in real-time with as short a latency as is reasonable given technical and budget realities. The maximum acceptable latency is 18 minutes.
    - The station and its systems must be designed to minimize data loss during extreme events, and to ensure that the full range of water levels is recorded.
    - The station should be placed in a location to disseminate near real-time data throughout extreme events if possible.
- For water level being displayed in the Coastal Inundation Dashboard, the total error of 6-minute water level observations accuracy must not exceed 30 cm (at 95% confidence). Total error is a combination of random error and systematic error.
- Real-time data for display in the Coastal Inundation Dashboard should be available to CO-OPS through a functional API that can be queried to retrieve data (i.e., a web service); this query should return 6 minute data and a time stamp of the observation centered on the 6 minute mark, i.e. 00, 06, 12, 18, 24,... past the hour. Other data intervals can be considered, but 6 minute is preferred. For tsunami capable stations, a functional API should return 1 minute data. All of the above must meet CO-OPS message encoding and formatting requirements.
- Regular monitoring of vertical stability is not required at these stations as they will not support navigation, nor be used to develop tidal predictions and datum products. However, it is recommended that sensors are installed on a stable platform (e.g. a concrete pier or bulkhead) above known flood levels using radar technology.
    - For stations included in the Coastal Inundation Dashboard, connection to the National Spatial Reference System is required in order to establish flood thresholds (minor, moderate, major). GPS occupation or a leveling survey must be performed at the station to establish a geodetic tie to North American Vertical Datum (NAVD) of 1988 heights, or the presently recognized vertical geodetic datum, to the gauge. This solution should be bluebooked through the National Geodetic Survey. The occupation does not have to be repeated on an annual basis, but preferably after a major event or when stations are upgraded or moved.
    - Connection to the National Spatial Reference System is NOT required for Tsunami capable stations.
- Station maintenance documentation or metadata reports are not required, nor is notification before station visits. If the station goes offline it will be flagged

through an automatic filter of the API and removed from display in the relevant products, until the issue is resolved.

- Check-in meetings every year between a partner POC and a designated Partnership Coordinator at CO-OPS are desired but not mandatory. This coordination provides an opportunity to communicate on the condition, performance, and operational plans for the station.