



Ocean Observing:

The National Water Level Observation Network (NWLON): evolution, operation and societal applications

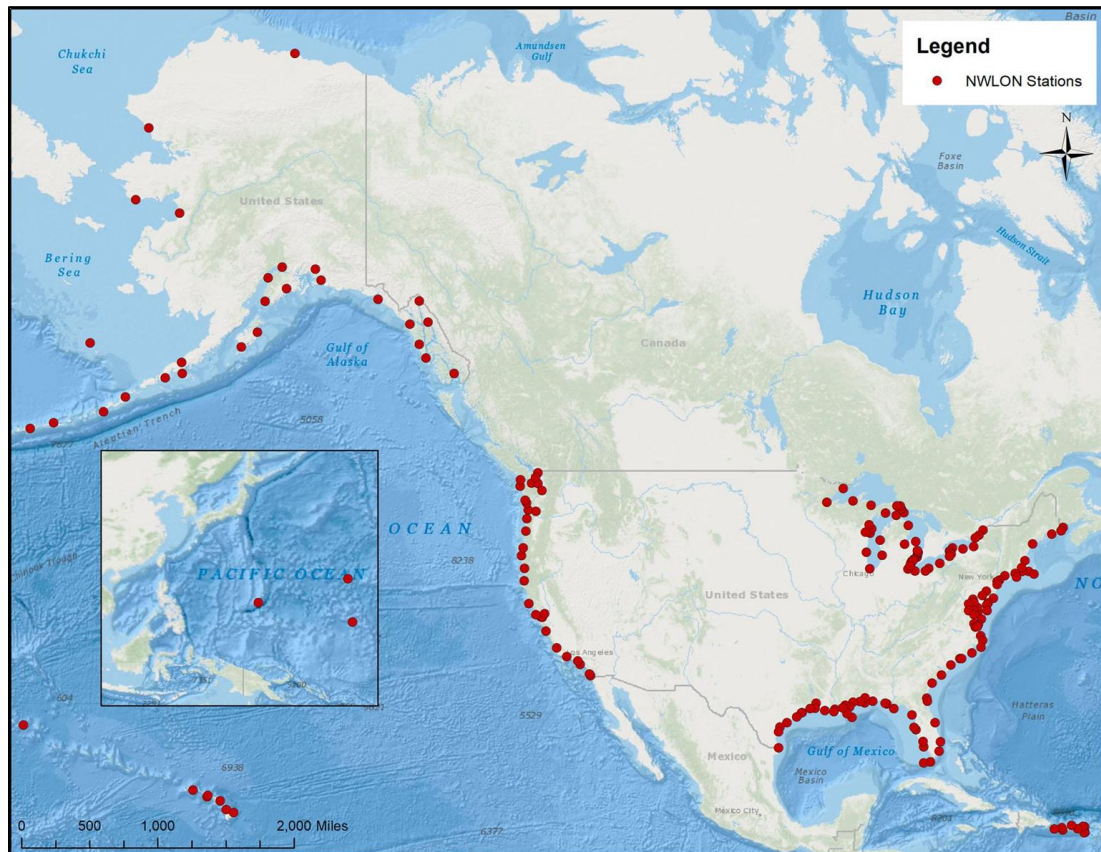
Richard Edwing,
Director

Center for Operational Oceanographic Products and Services
National Oceanic and Atmospheric Administration | National Ocean Service

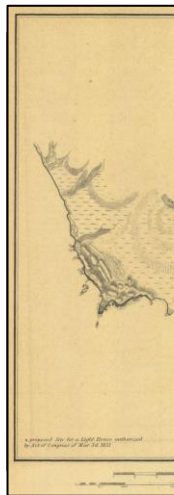
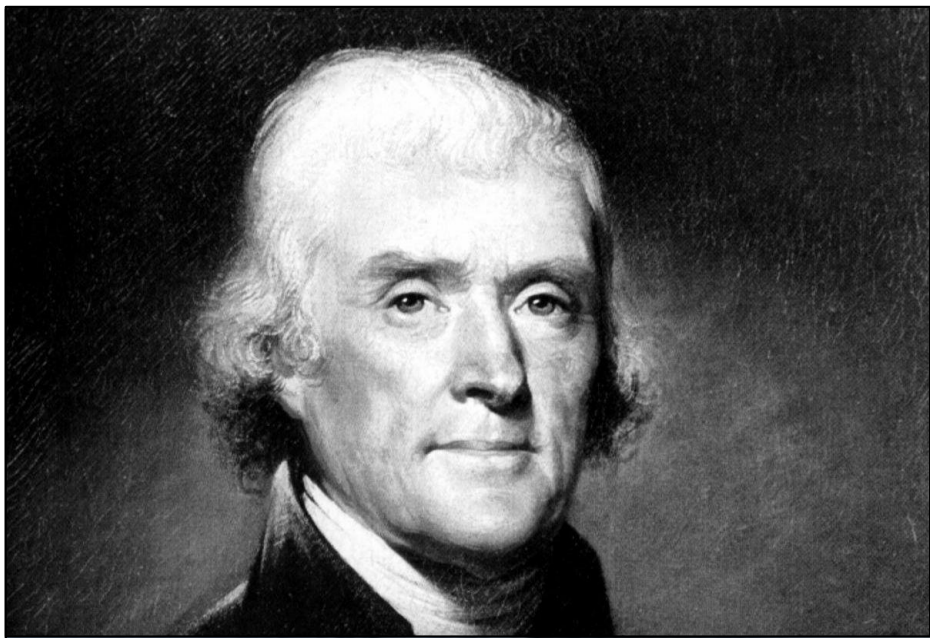
tidesandcurrents.noaa.gov

**United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea
Twenty-Second meeting: 6 – 10 June 2022**

What is NWLON?

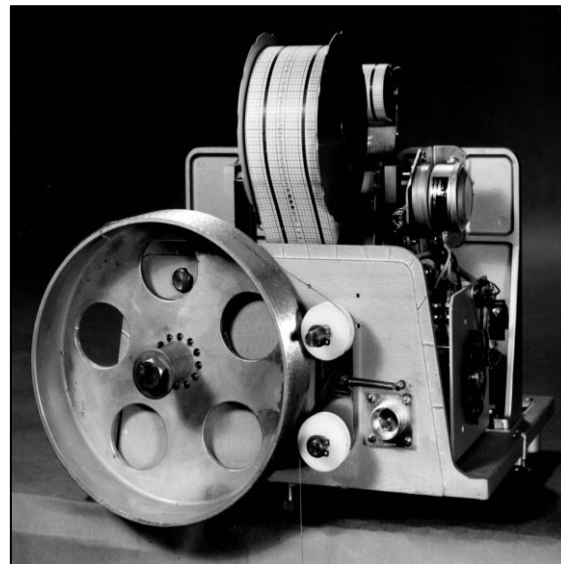
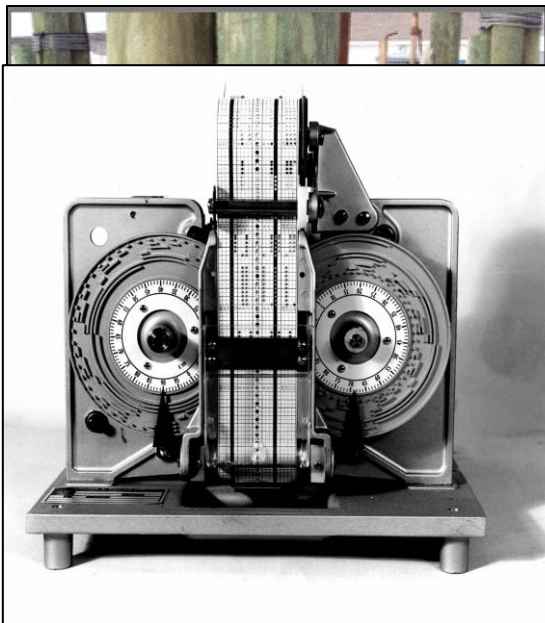
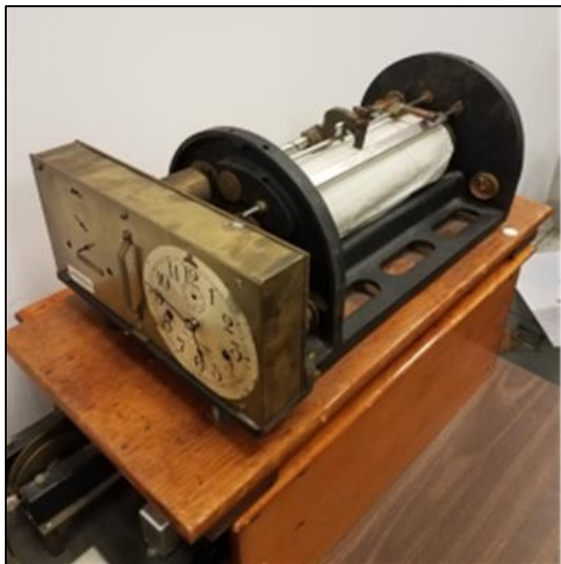


Beginnings



Centuries of Evolution in 2 Minutes

1840s–1880s

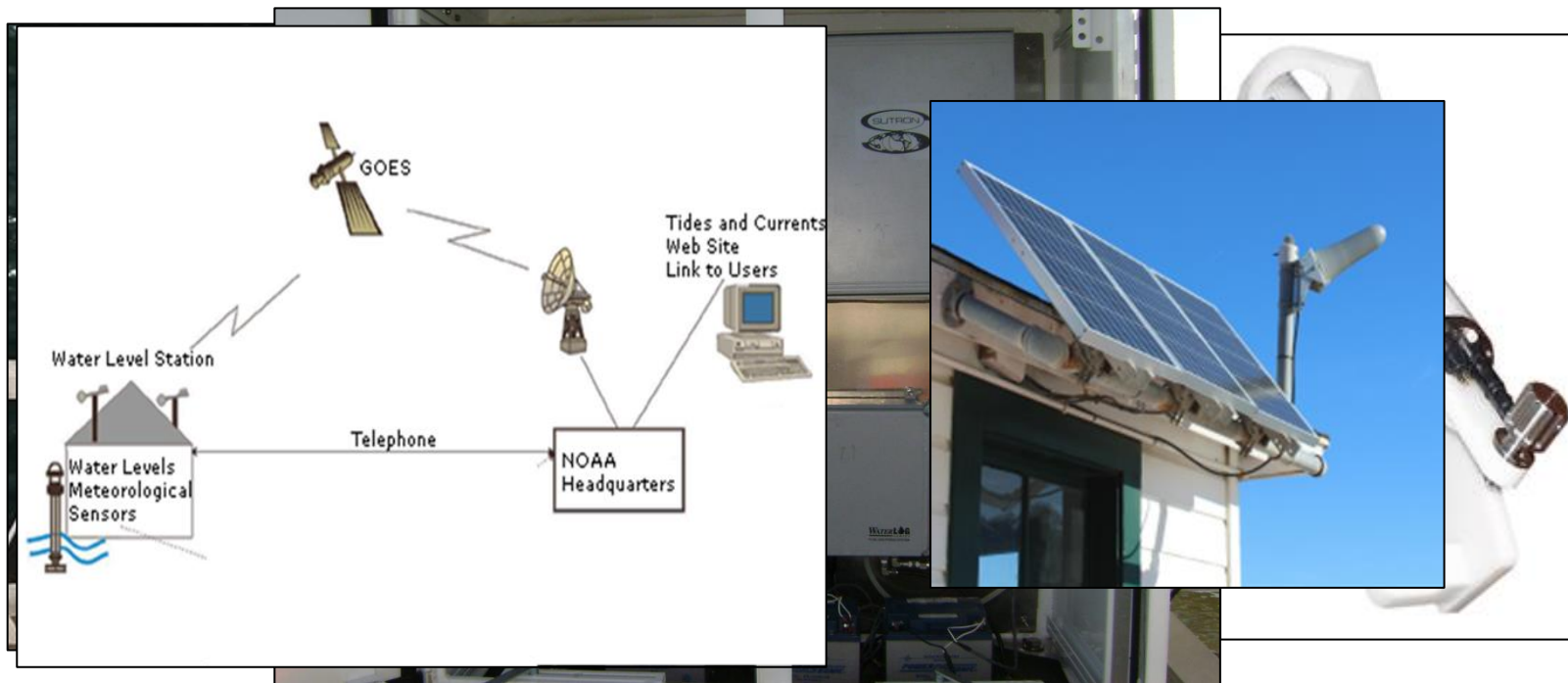


Centuries of Evolution in 2 Minutes

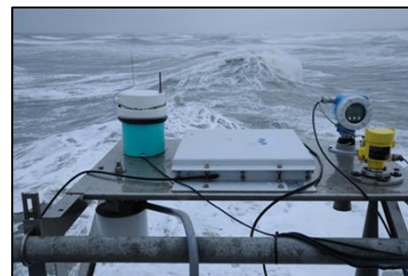
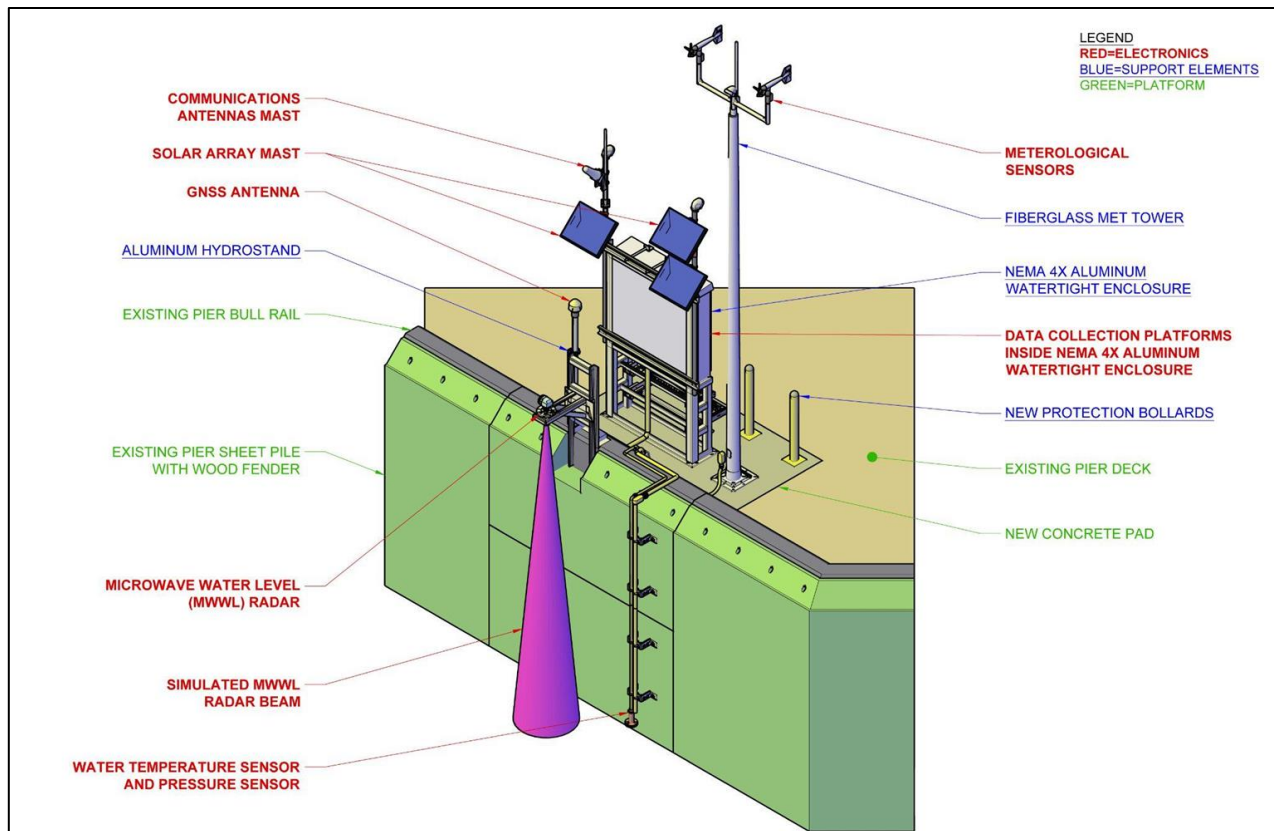
1980s



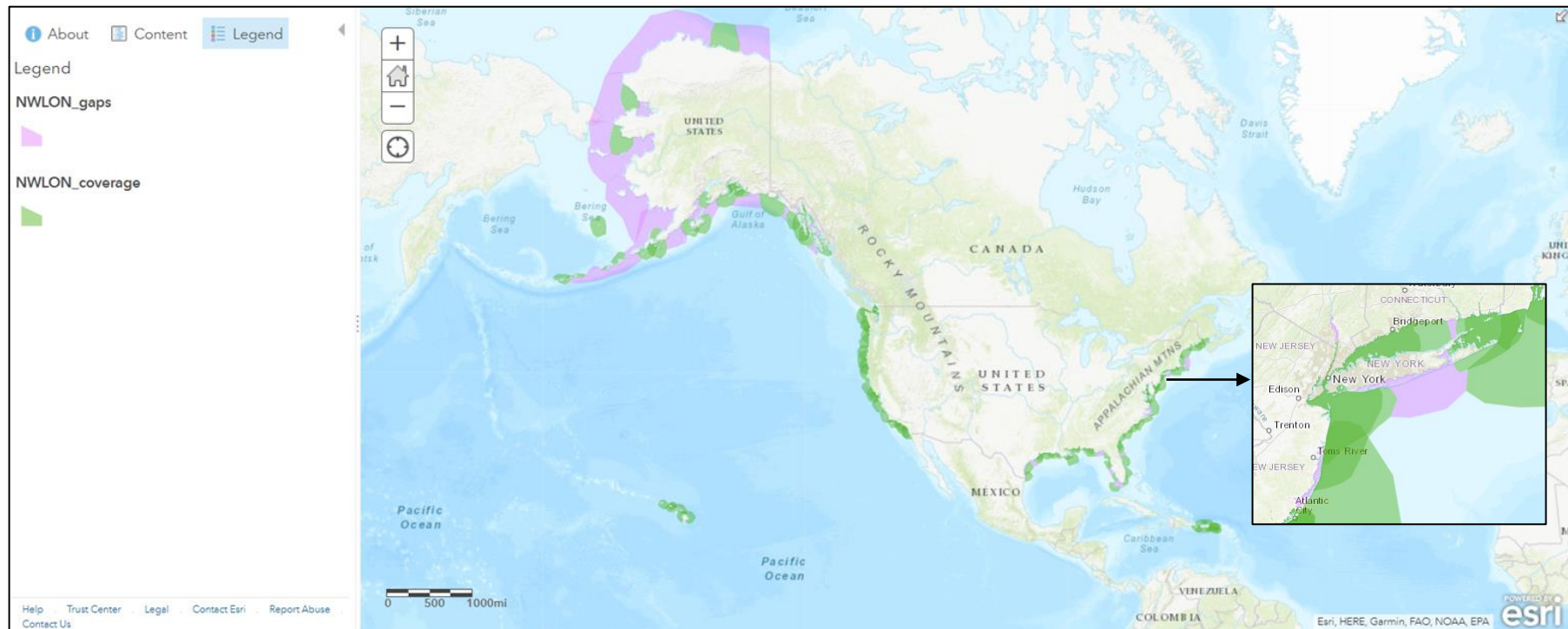
present day



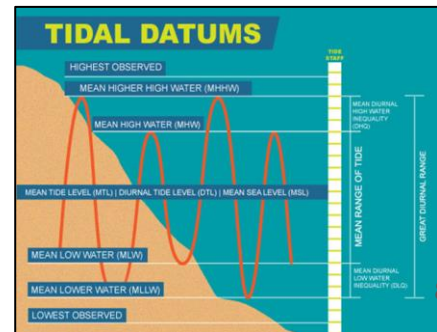
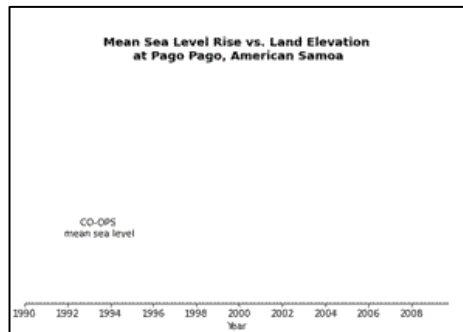
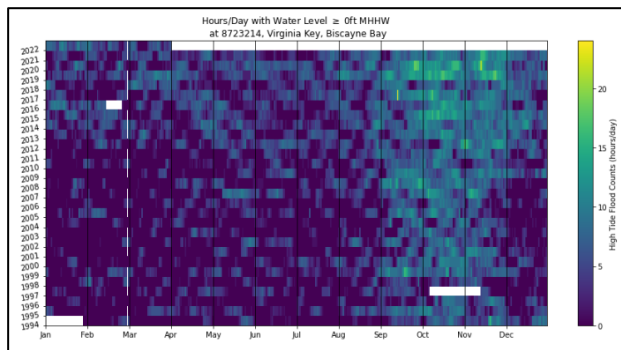
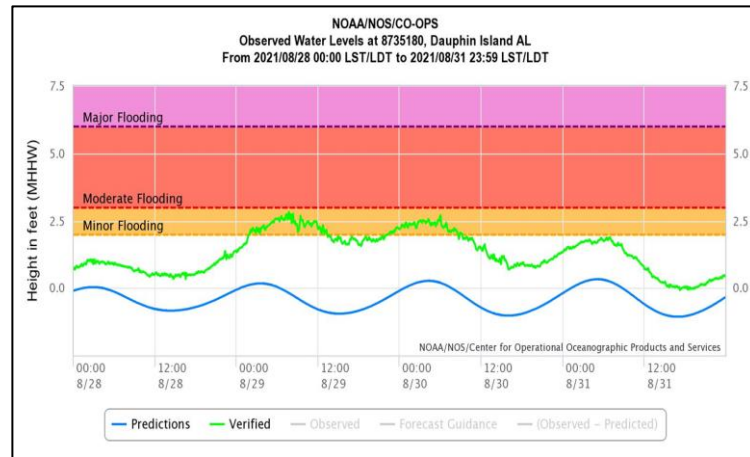
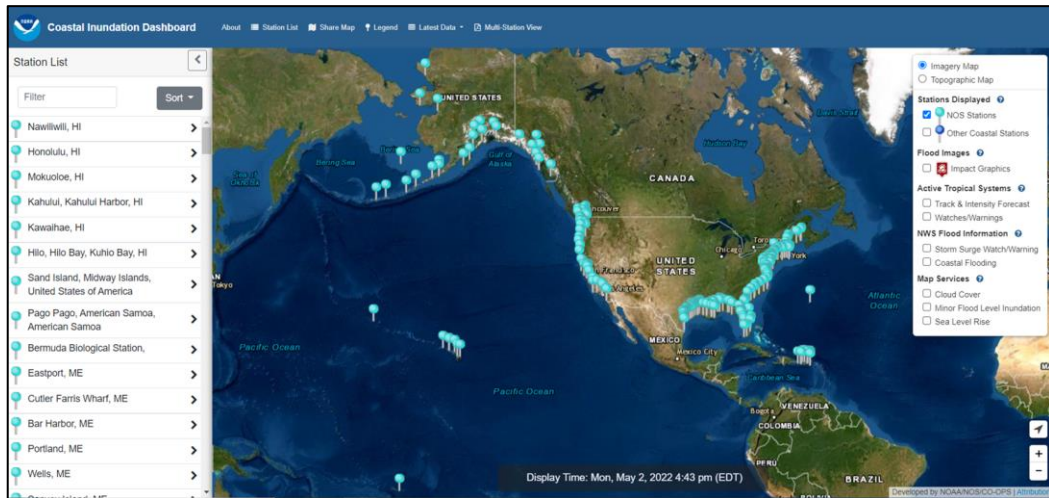
Typical NWLON Station Design



NWLON Network Design/Gaps



Importance of Products that Communicate

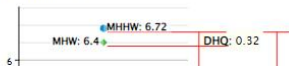


Maritime Commerce, Non Real-Time



Datums for 8465705, New Haven, CT

All figures in feet relative to MLLW



[Back to Station Listing](#) | [Help](#)

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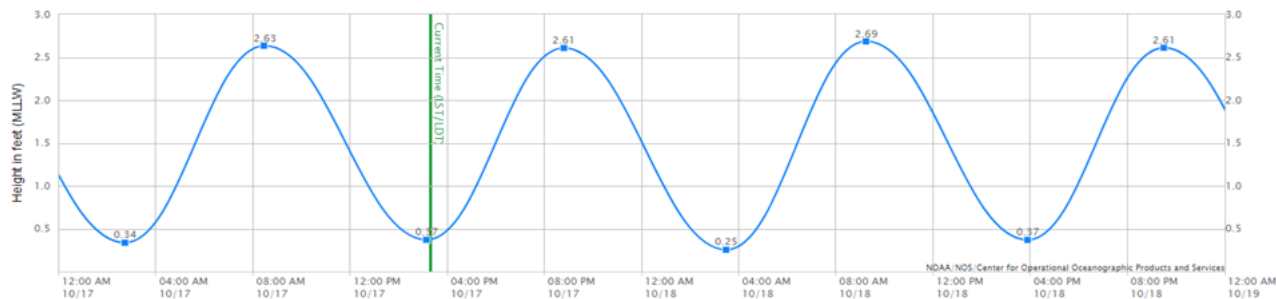
[Click Here for Annual Published Tide Tables](#)

NOAA/NOS/CO-OPS

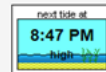
Tide Predictions at 8723205, DINNER KEY MARINA, BISCAYNE BAY FL

From 2017/10/17 12:00 AM LST/LDT to 2017/10/18 11:59 PM LST/LDT

Subordinate Station | Ref. Station (MIAMI BEACH, GOVERNMENT CUT 8723178) | Time offsets (high: 54 min. low: 108 min.) | Height offsets (high: *0.84 ft. low: *0.92 ft.)



Today's Tides (LST/LDT)



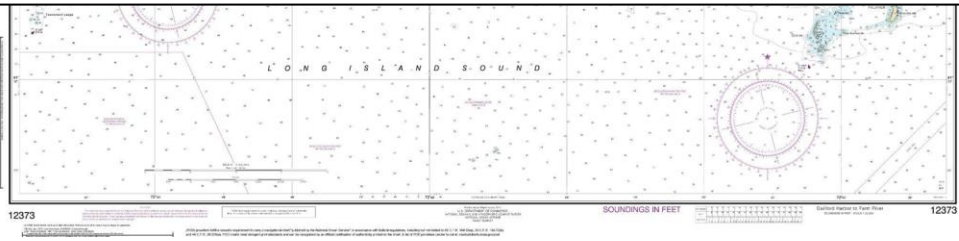
2:43 AM	low	0.34 ft.
8:28 AM	high	2.63 ft.
3:08 PM	low	0.37 ft.
8:47 PM	high	2.61 ft.

MLLW

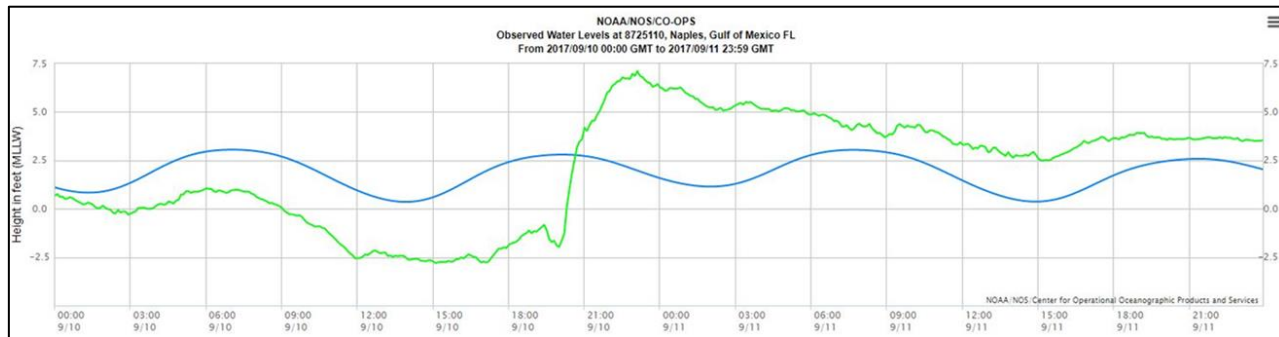
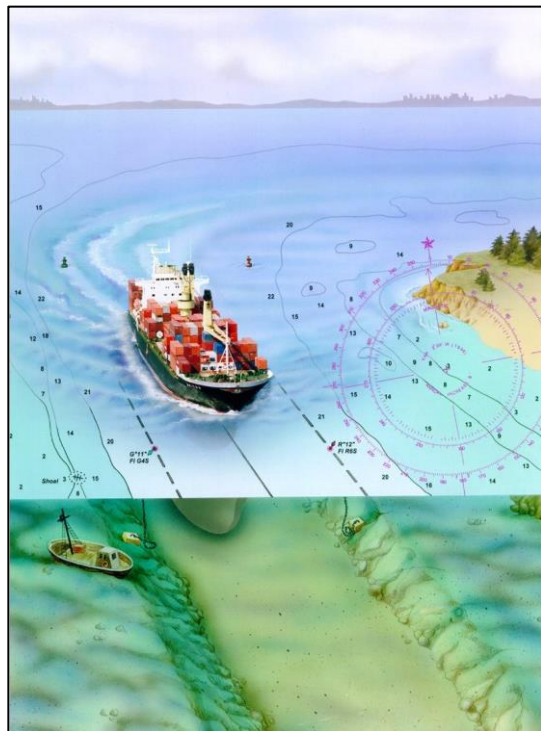
Data Units ☒ Feet
☐ Meters

Epoch ☒ Present (1983-2001)
☐ Superseded (1960-1978)

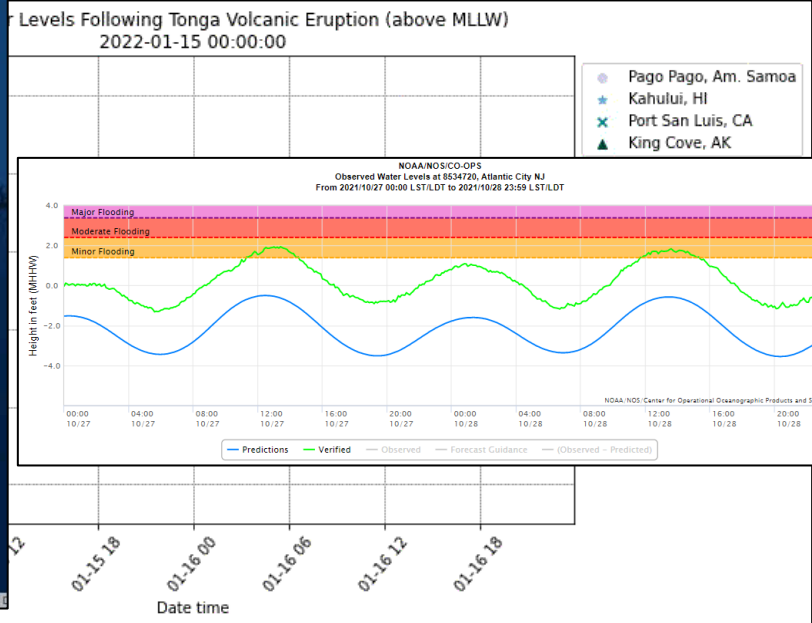
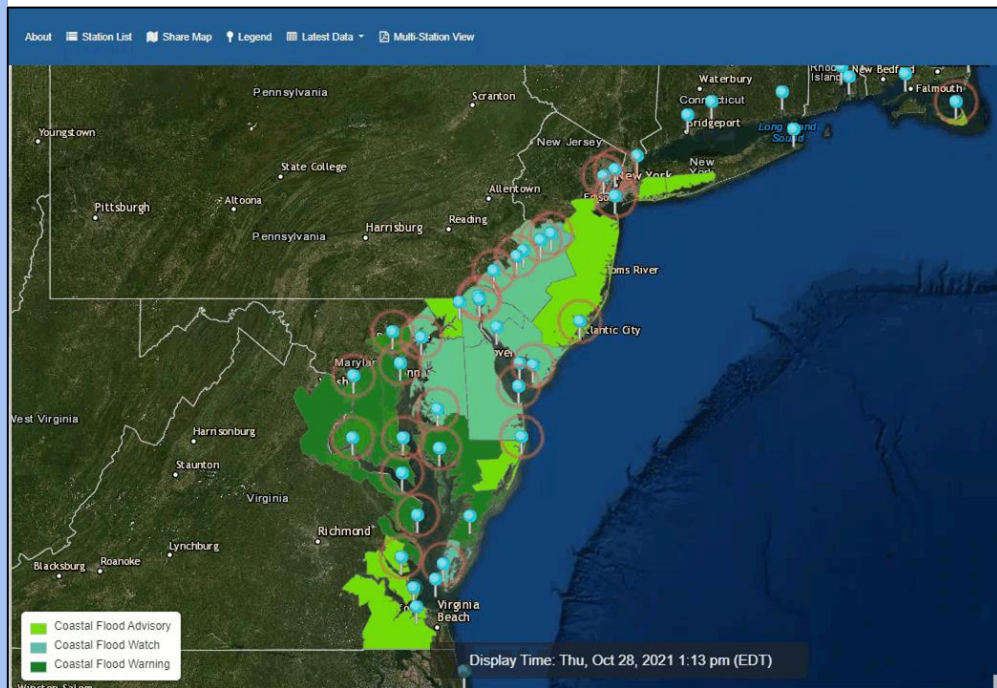
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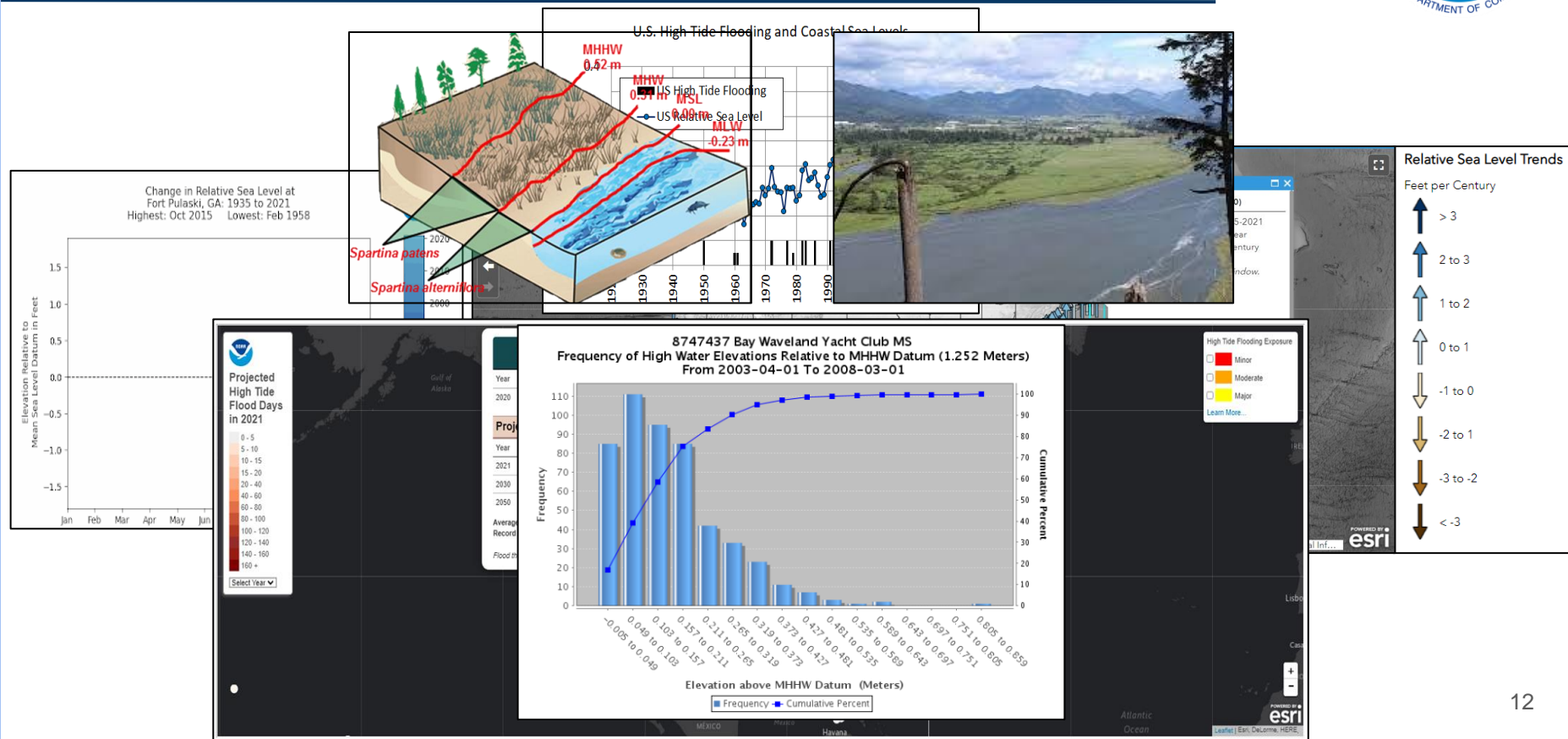
Maritime Commerce, Real-Time



Resilience, Real-Time



Resilience, Non Real-Time



Summary - Top 3 Thoughts



1. Understand and document the observing system requirements.
2. Build the observing system to fill priority location gaps and use technology to minimize data series gaps.
3. Interact with users to ensure products are conveying the information needed for the societal application.

NWLON Data Gaps



Data Stages: **Raw** (no quality control) > **Preliminary** (automated QC) > **Verified** (full QC)

Data is attributed as **Observed** vs **Filled**

Gaps

- Small gaps (minutes to 4 hours) – linear fit or least squares method. Backup sensor used for “noisy” data.
- Medium gaps (4 hours to 3 days) – Backup sensor then nearby stations then predicted data.
- Large gaps (> 3 days) – unfilled unless good match with nearby station, up to 5 days.

