UNIVERSITY OF HAWAI'I
SEA LEVEL CENTER

GLOSS-GE XVIII Data Center Report

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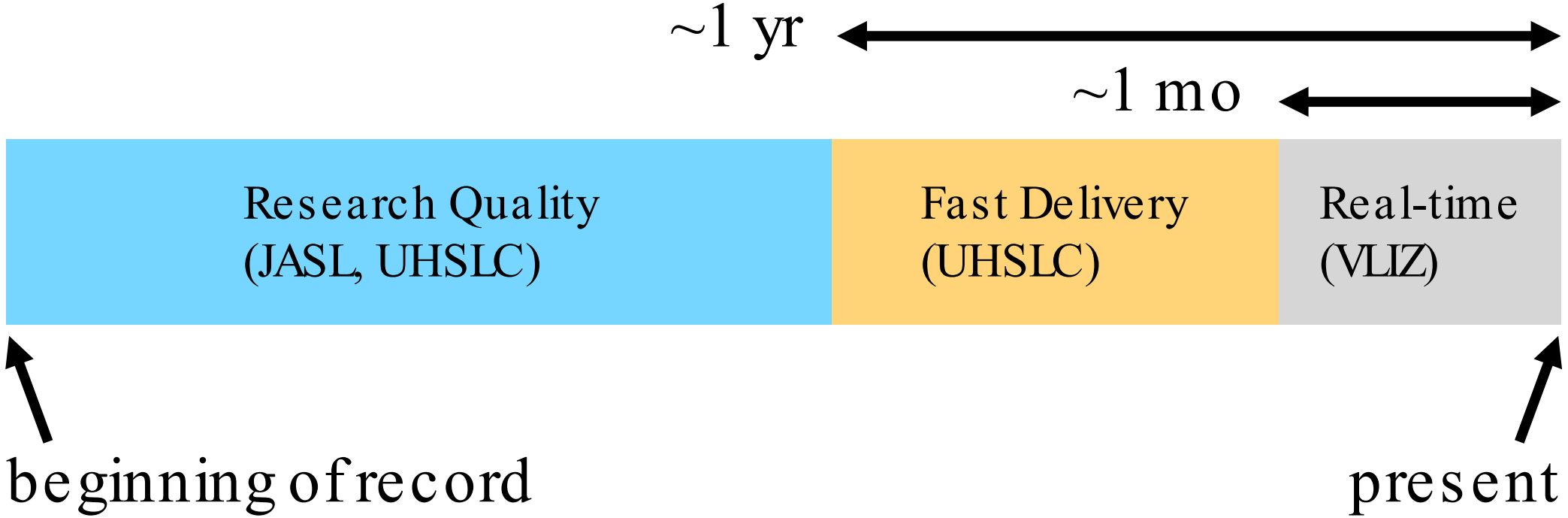
Director, UH Sea Level Center

UHSLC Data Offerings

Two high-frequency data streams with hourly and daily resolution:



UHSLC Data Offerings

Two high-frequency data streams with hourly and daily resolution:

1. Fast Delivery → ~1-month latency
   - QC focused on outlier detection
   - Mostly focused on GLOSS Core Network

2. Research Quality (i.e., JASL) → ~1-year latency
   - QC focused on vertical stability and timing
   - Documentation of station history and metadata
   - Contributes data to PSMSL
   - Contributes data from 97 of the 114 countries in GESLA-3

JASL Research Quality Data Update

2025 GLOSS-GE-XVIII meeting

Ayesha Genz, JASL Data Manager

National Centers for Environmental Information (NCEI)

March 11-14, 2025

Research Quality (JASL) update

As of December 2024

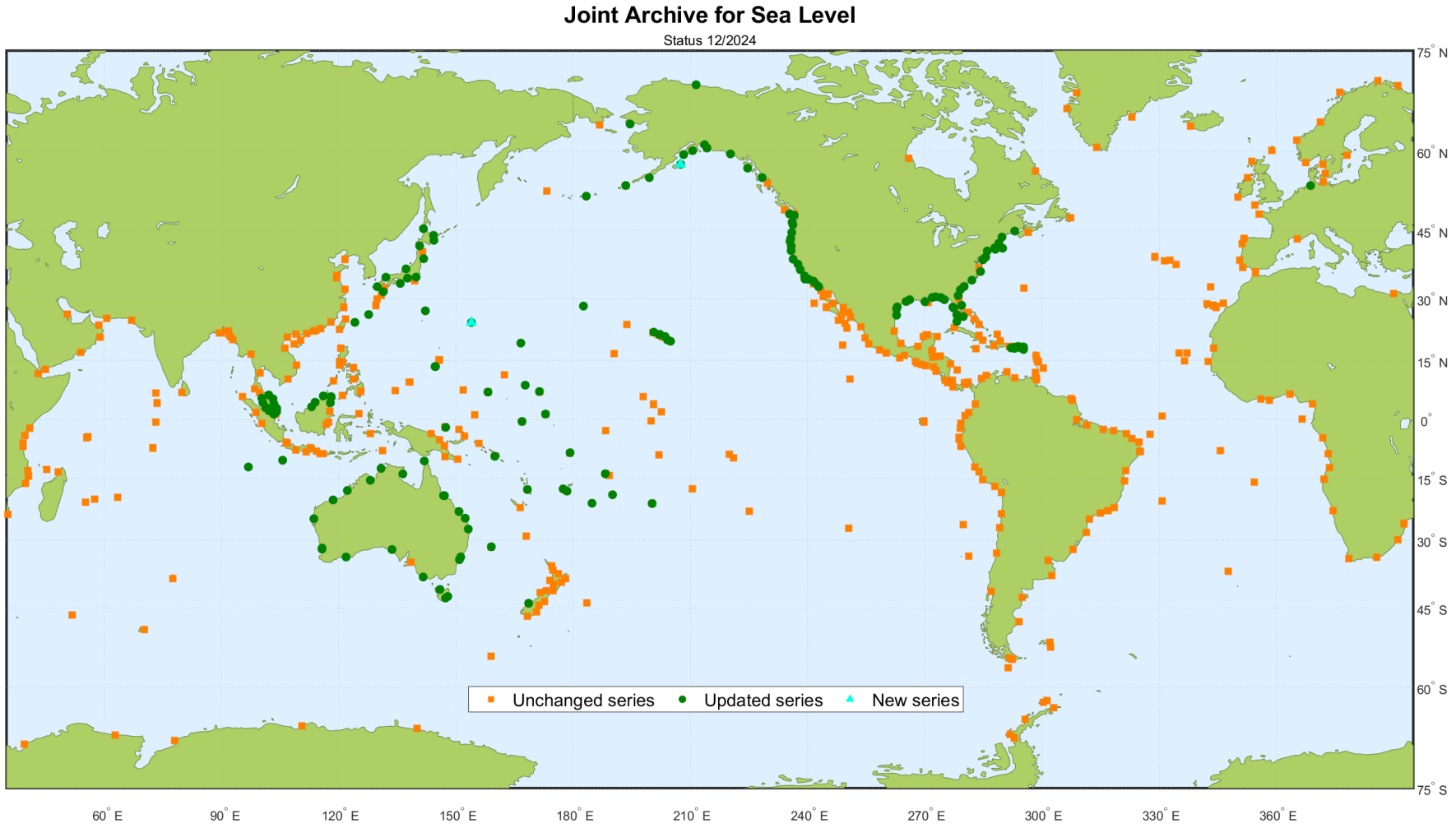
- Revamped metadata from .dmt files to .yaml files so that it is machine readable. This is a temporary solution until the UHSLC database is up and running.
- Total JASL archive contains 19,405 station-years from 691 series.
- GLOSS Research Quality archive contains 10,880 station-years from 254 unique sites.
- Relative to 2020 archive, the 2024 status added 928 station-years from 157 series.
- 18 series extended backwards totaling 296 station-years.

JASL citation

Caldwell, Patrick C.; Merrifield, Mark A.; Thompson, Philip R. (2001). Sea level measured by tide gauges from global oceans as part of the Joint Archive for Sea Level (JASL) since 1846. NOAA National Centers for Environmental Information. Dataset. https://doi.org/10.7289/v5v40s7w

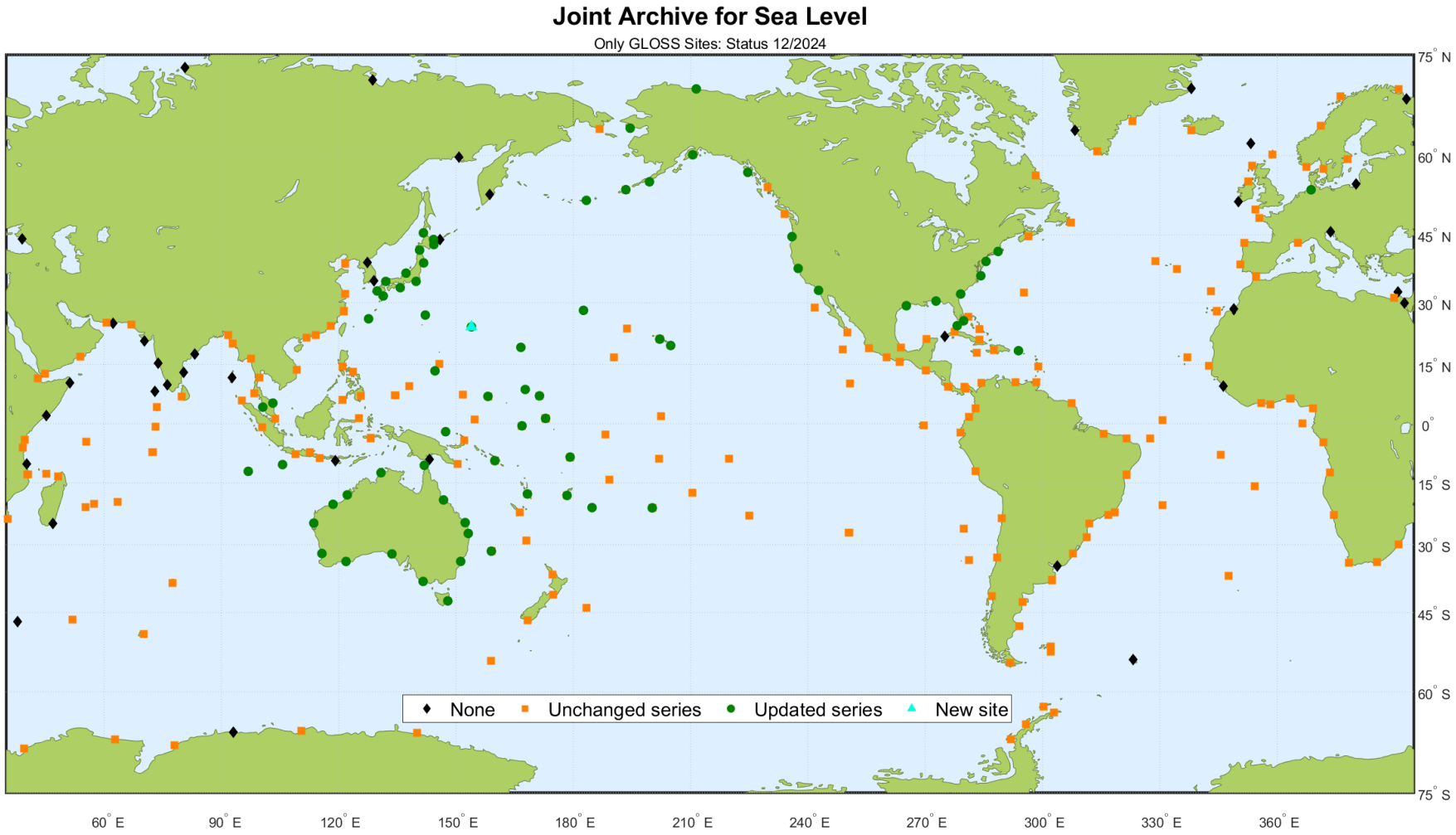
Research Quality (JASL) update

All Stations

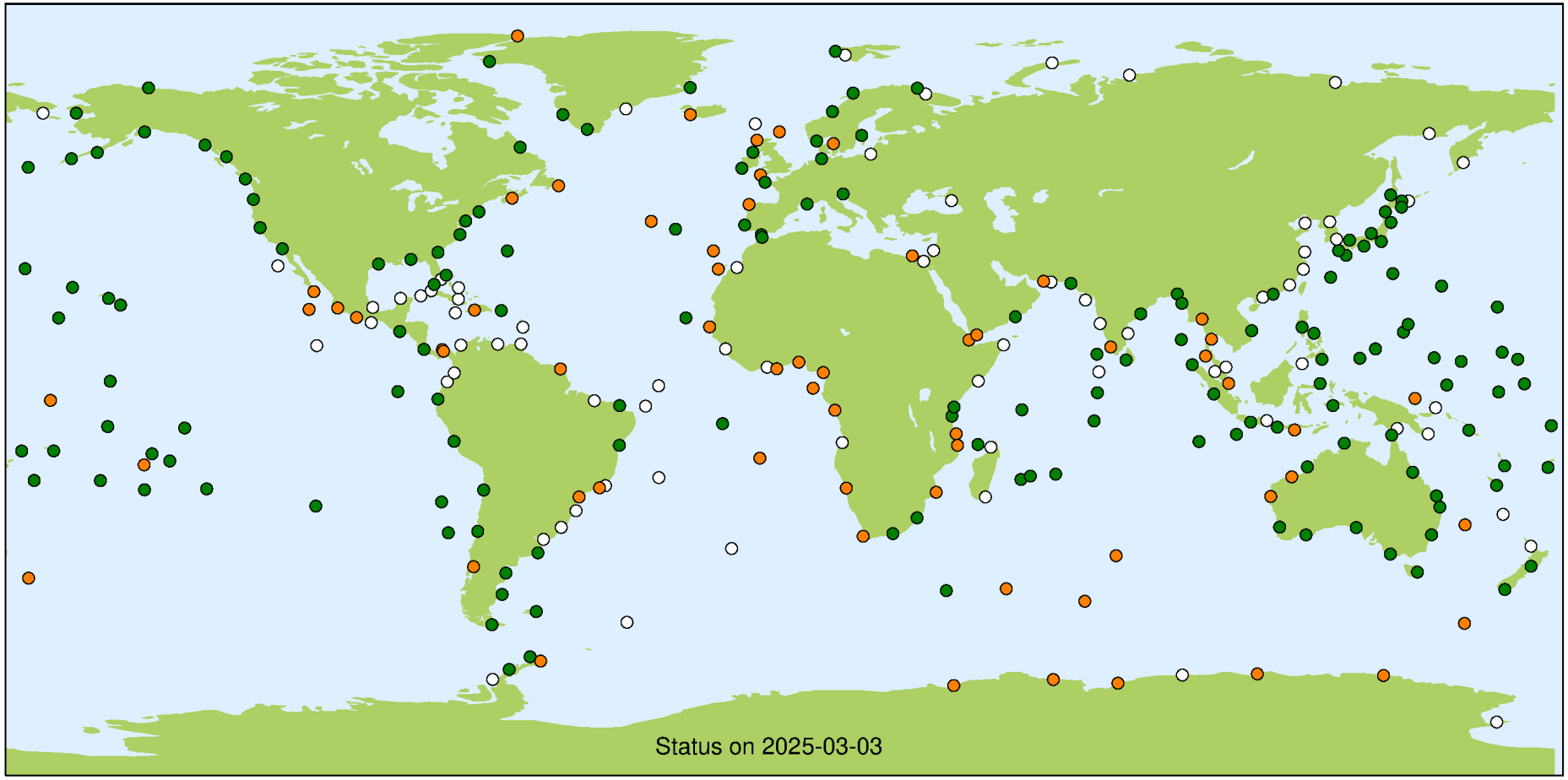


Research Quality (JASL) update

GLOSS Stations



UHSLC Fast Delivery Status



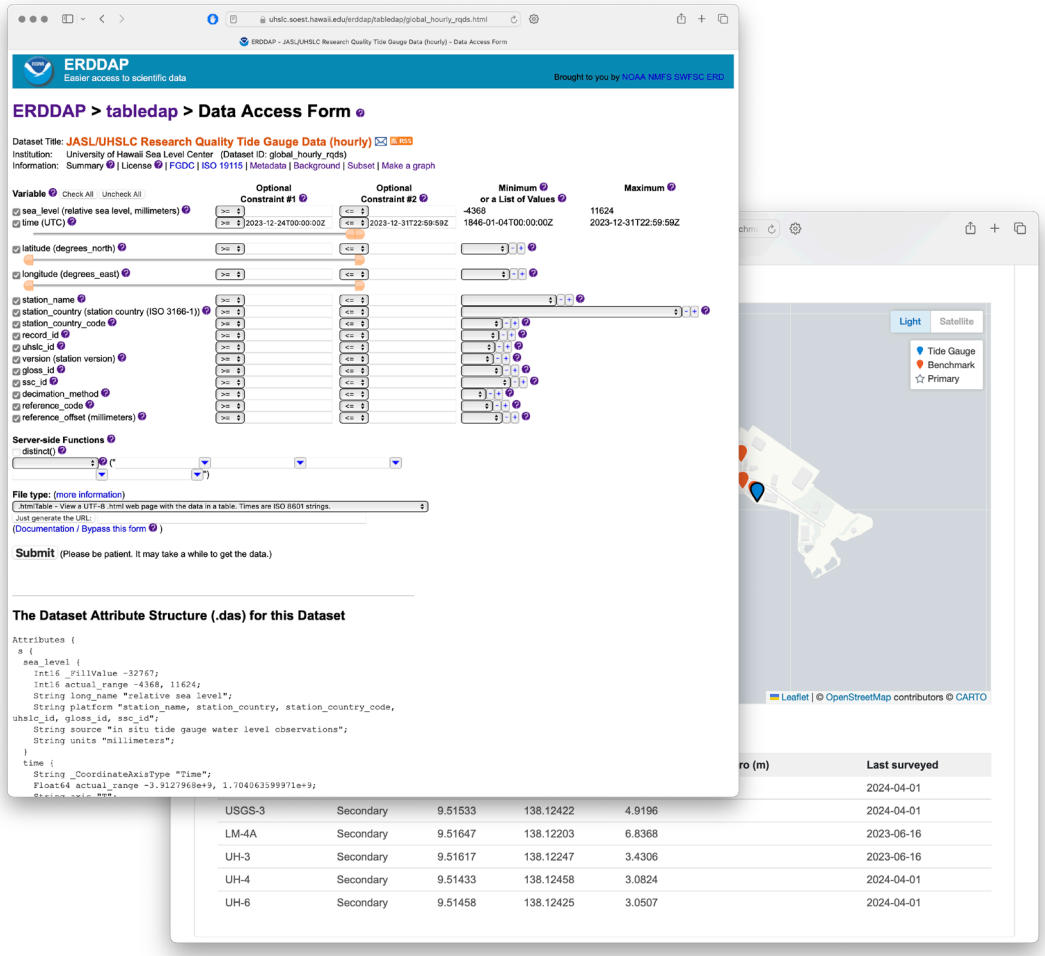
UHSLC Website and Data Access

Data access is provided via:

- Legacy data table
- ERDDAP
- OpenDAP

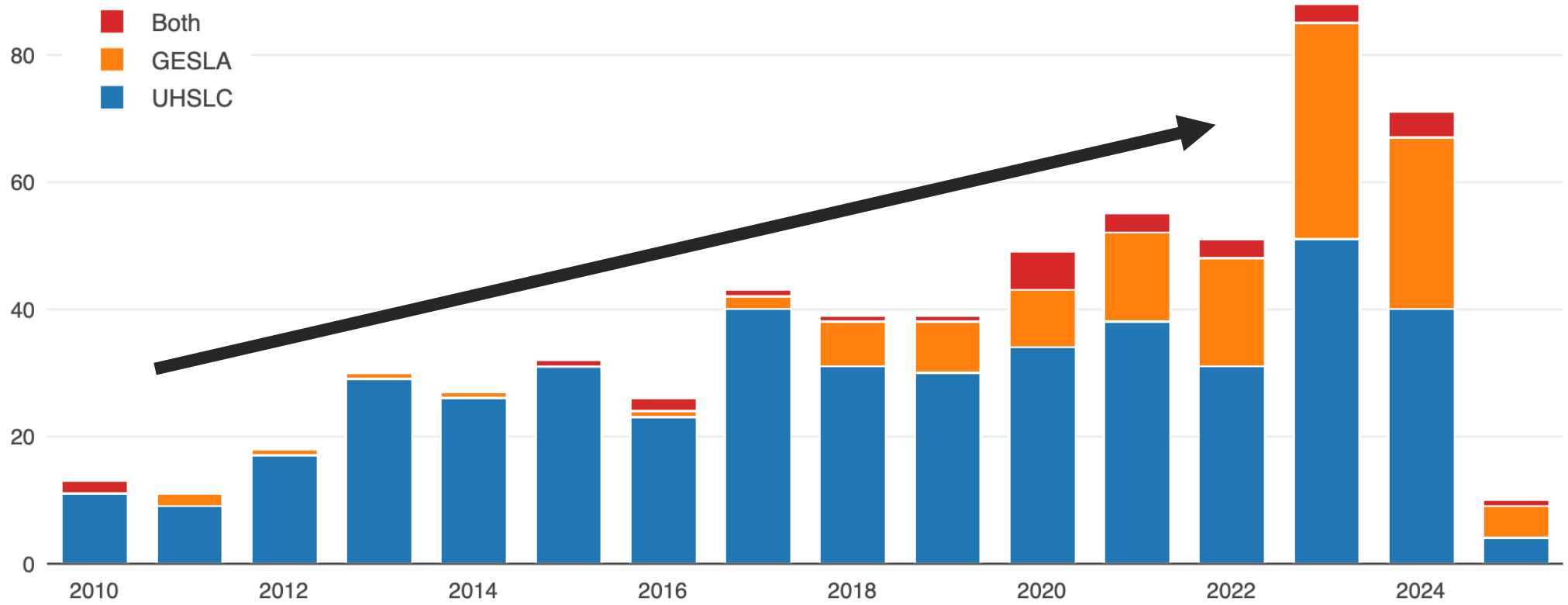
Minor updates:

- RQ metadata migrated to machine readable YAML files (non-trivial!)
- UHSLC benchmark data standardized and (almost) on the web.



UHSLC Website and Data Access

Data use in peer-reviewed publications



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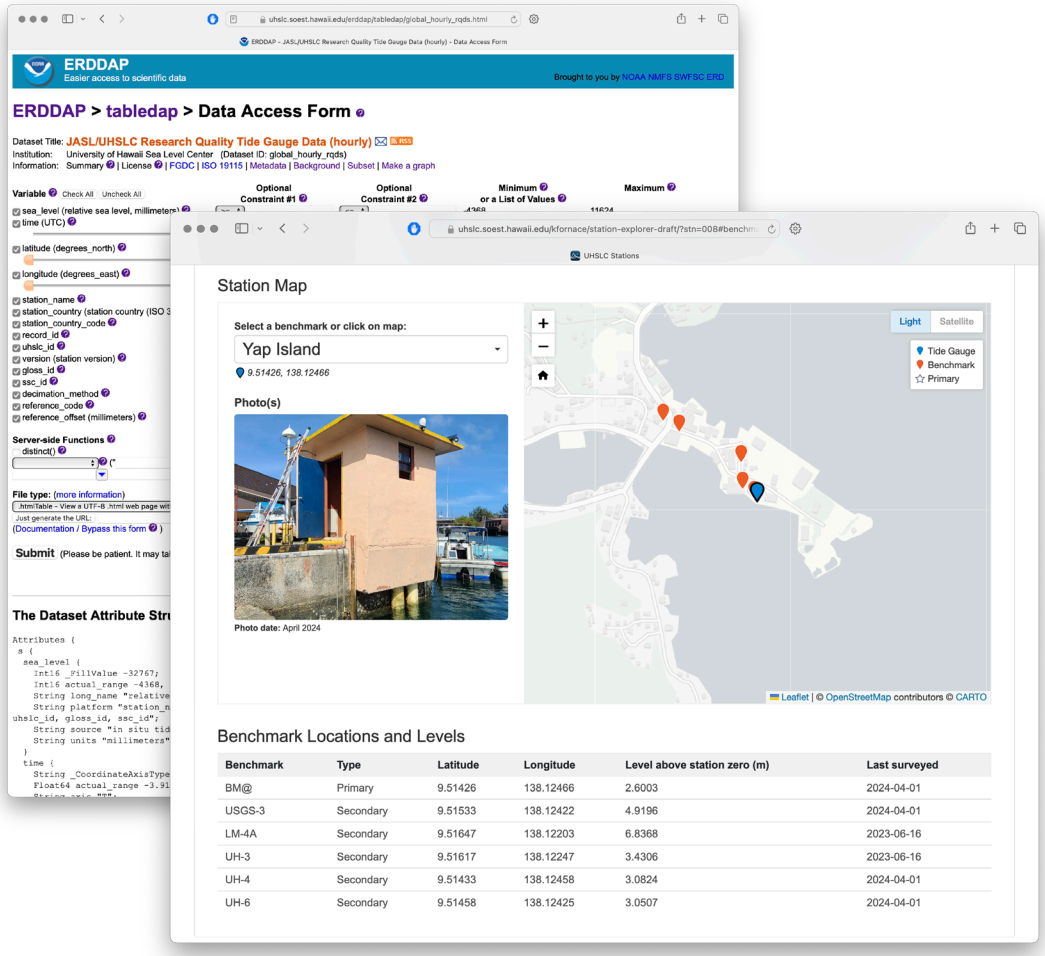


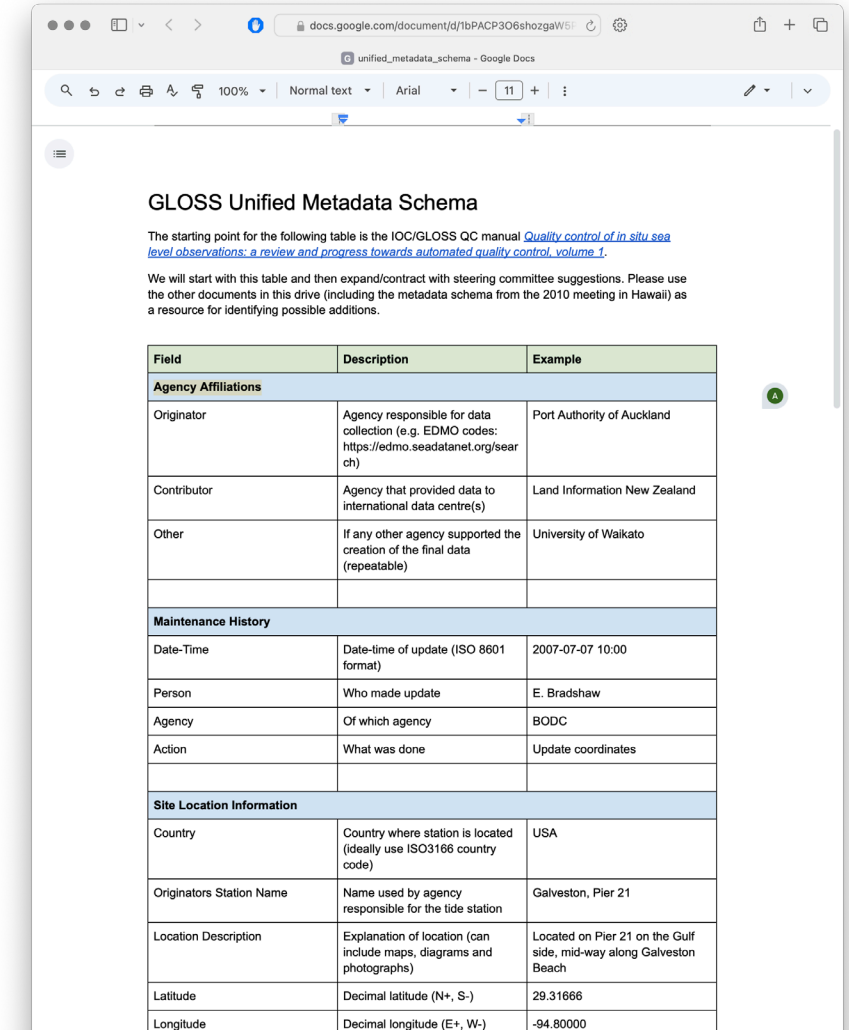
UHSLC Website and Data Access

Ongoing objectives

Update UHSLC database schema

- Update to GLOSS unified metadata schema
- Reclassify data streams using controlled language
  - Water level vs. relative sea level
  - Raw → Level 0
  - Research Quality → Level 4
- Produce “best available” time series
  - Each value receives a quality flag (Level 3, 4, etc.)
  - Possible with database modernization (next slide)

From GLOSS SC meeting January 2024



GLOSS Unified Metadata Schema

The starting point for the following table is the IOC/GLOSS QC manual *Quality control of in situ sea level observations: a review and progress towards automated quality control, volume 1*.

We will start with this table and then expand/contract with steering committee suggestions. Please use the other documents in this drive (including the metadata schema from the 2010 meeting in Hawaii) as a resource for identifying possible additions.

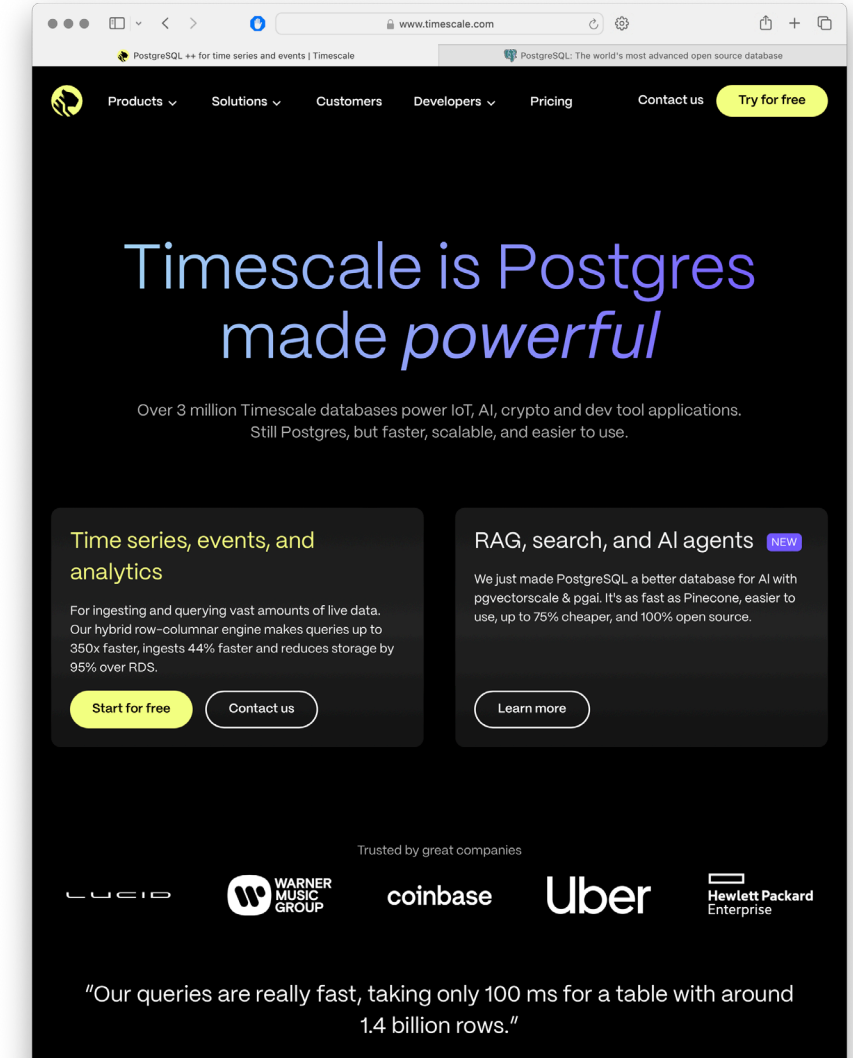
Field	Description	Example
Agency Affiliations		
Originator	Agency responsible for data collection (e.g. EDMO codes: https://edmo.seadatanet.org/search)	Port Authority of Auckland
Contributor	Agency that provided data to international data centre(s)	Land Information New Zealand
Other	If any other agency supported the creation of the final data (repeatable)	University of Waikato
Maintenance History		
Date-Time	Date-time of update (ISO 8601 format)	2007-07-07 10:00
Person	Who made update	E. Bradshaw
Agency	Of which agency	BODC
Action	What was done	Update coordinates
Site Location Information		
Country	Country where station is located (ideally use ISO3166 country code)	USA
Originators Station Name	Name used by agency responsible for the tide station	Galveston, Pier 21
Location Description	Explanation of location (can include maps, diagrams and photographs)	Located on Pier 21 on the Gulf side, mid-way along Galveston Beach
Latitude	Decimal latitude (N+, S-)	29.31666
Longitude	Decimal longitude (E+, W-)	-94.80000

UHSLC Website and Data Access

Ongoing objectives

Database migration: ASCII → PostgreSQL

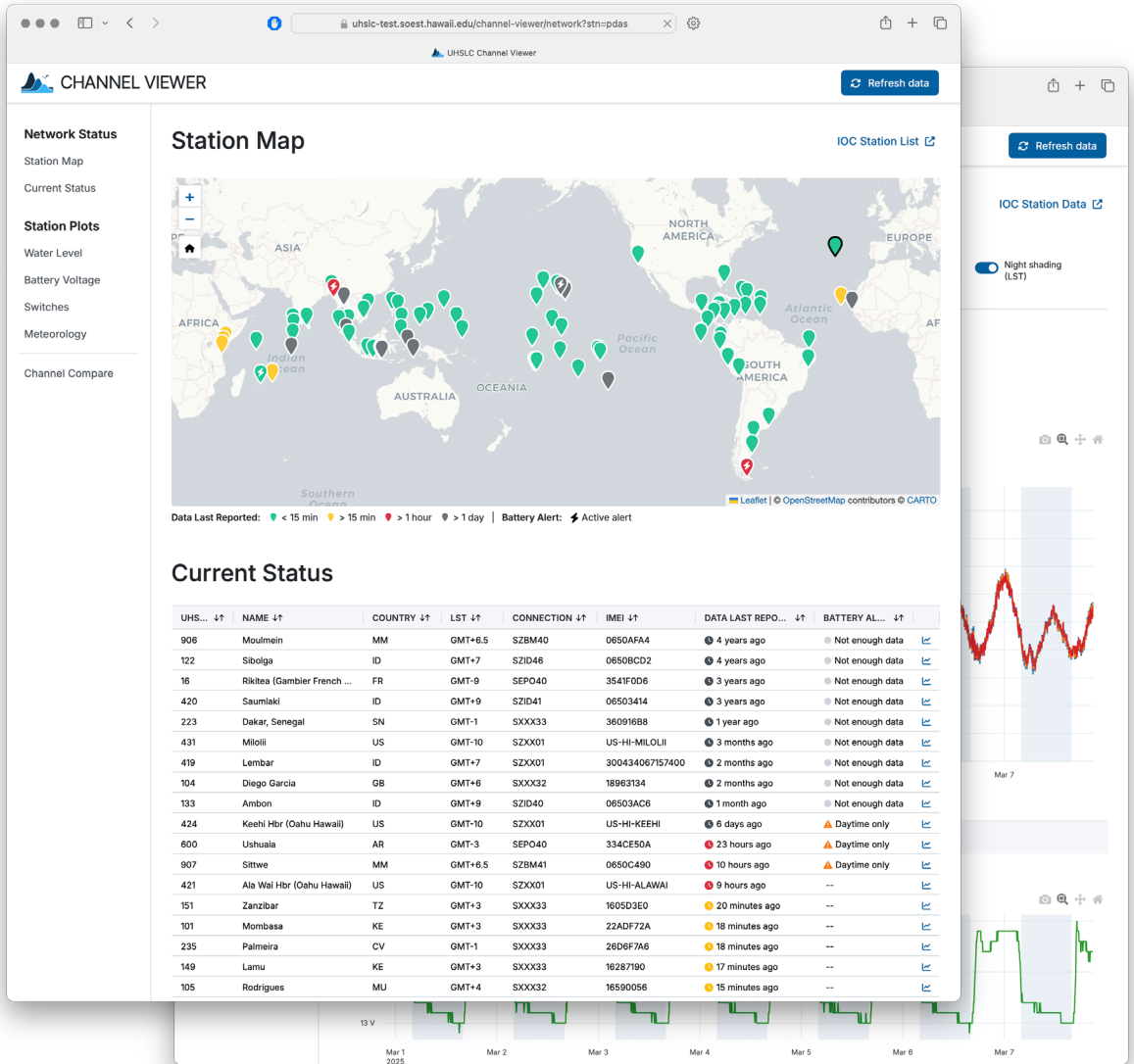
- Modernize database infrastructure to improve data access and interactivity
- Utilize an open-source, extended PostgreSQL framework optimized for time series (Timescale)
- Design database structure to accommodate complex tide-gauge metadata and relationships between time series
- UHSLC real-time streams are operational



UHSLC Website and Data Access

Modern database enables:

- New internal tool for technicians to monitor the status of UHSLC real-time stations/data.
- Ongoing development is focused on public tools to interact with historical records.



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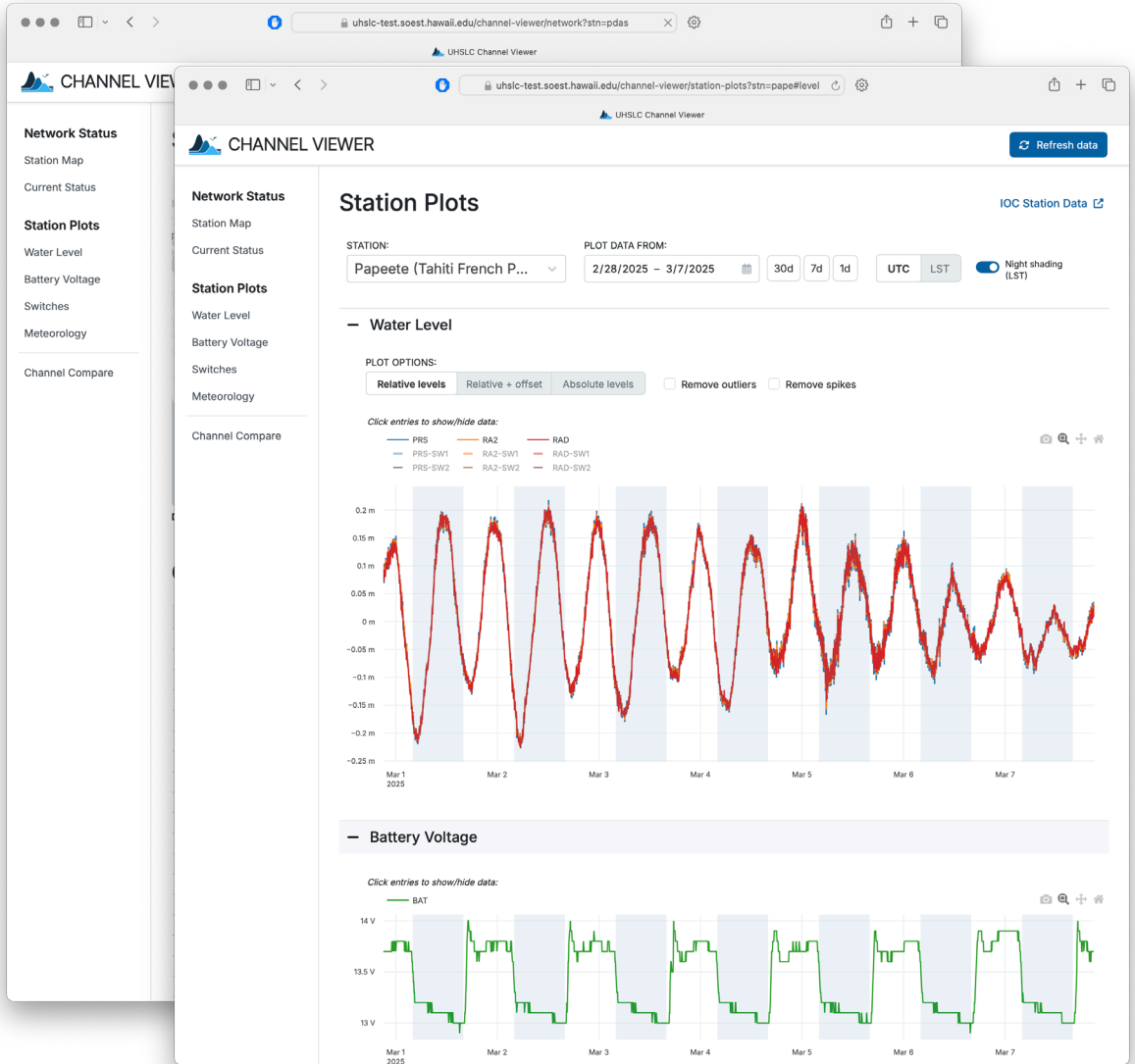
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