DBCP38 – Oct 2022

Convergence Accelerator

BACKYARD BUOYS

Locally owned, globally connected, building resilience.

BackyardBuoys.org

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Partnerships

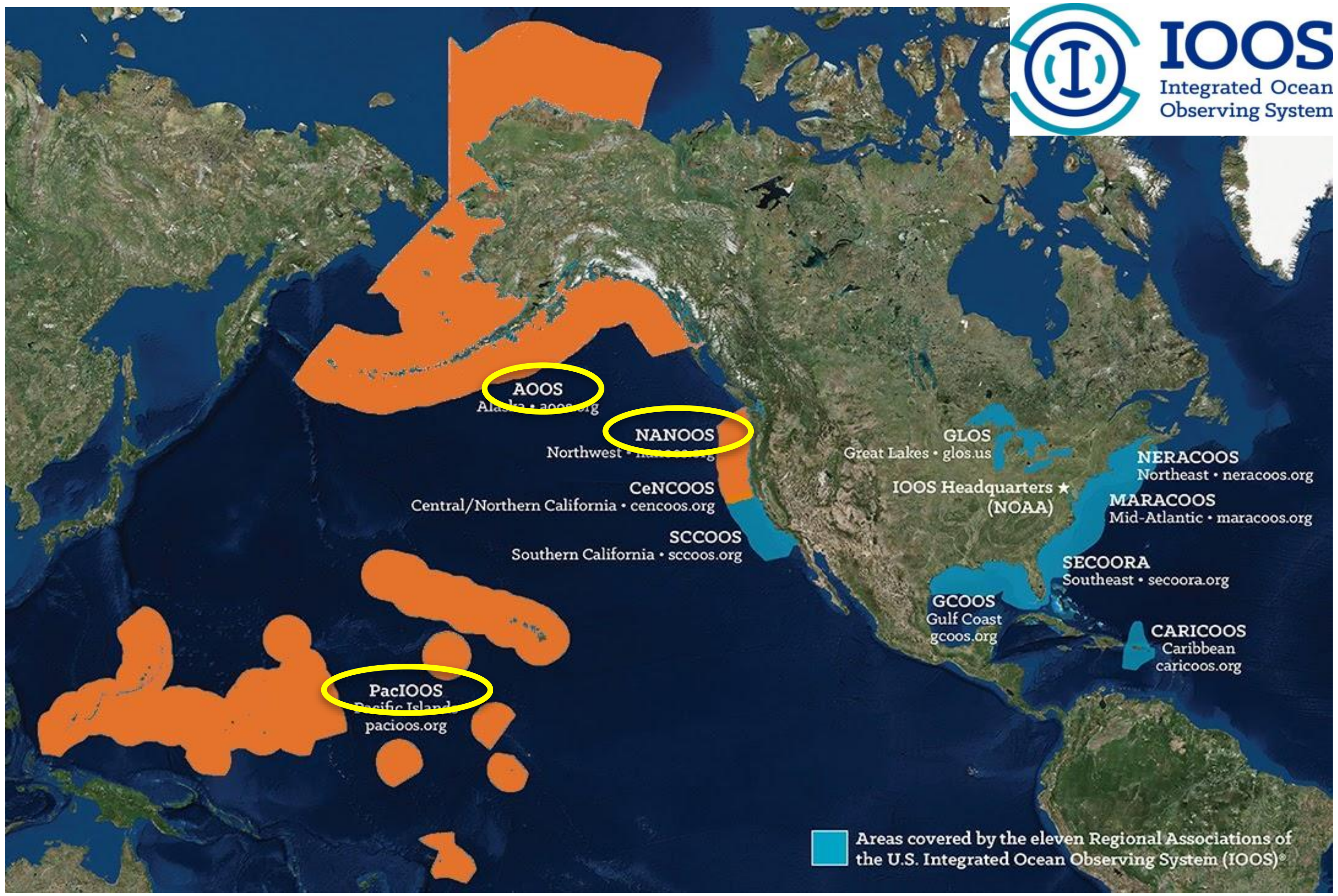
AOOS
Alaska Ocean Observing System

ALASKA ESKIMO
WHALING COMMISSION

Principal Investigators

NANOOS

QUINAULT INDIAN NATION



IOOS
Integrated Ocean Observing System

PacIOOS
PACIFIC ISLANDS OCEAN OBSERVING SYSTEM

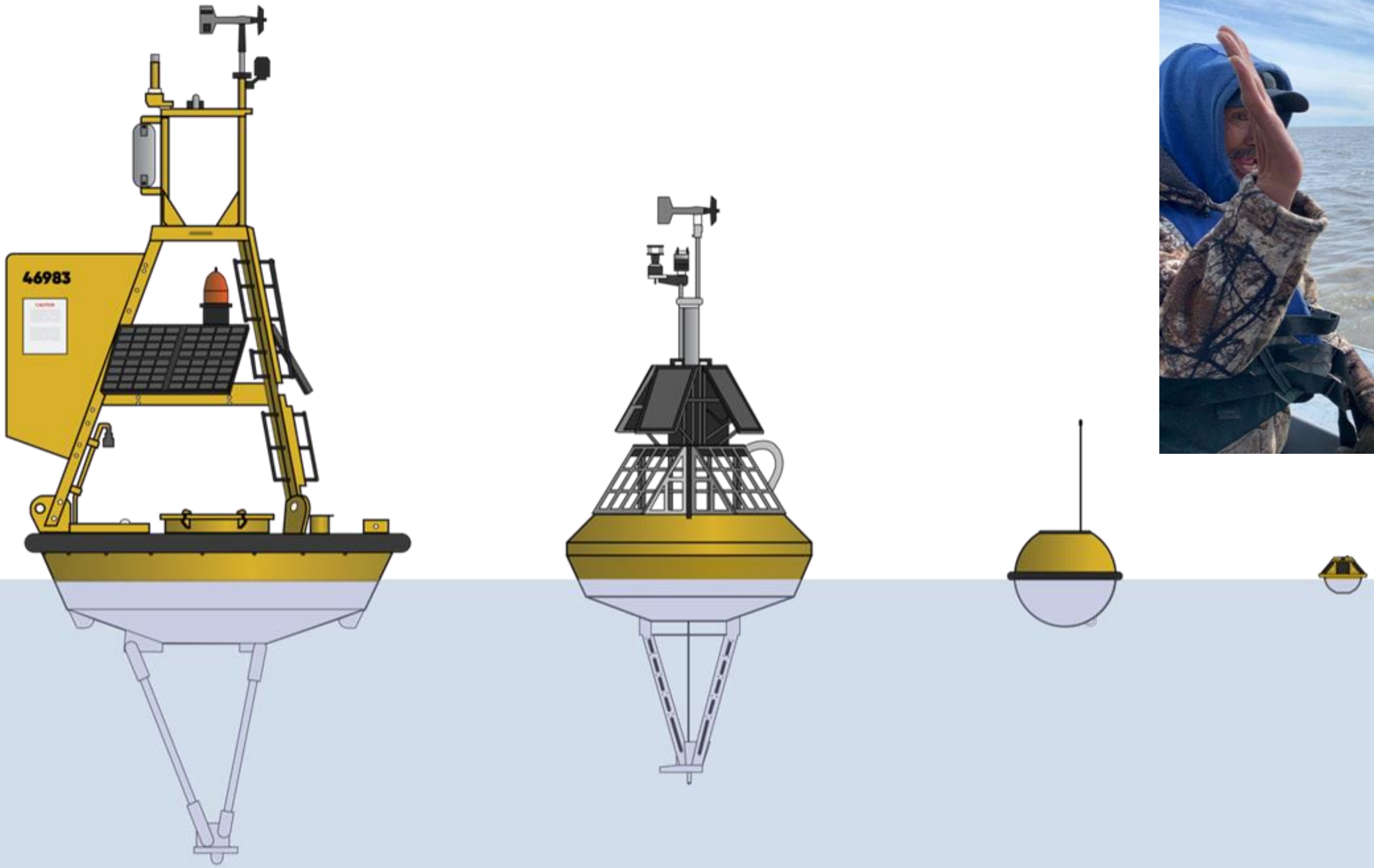
NATIONAL PARK SERVICE

MICS
Marshall Islands Conservation Society

Climate Change

Indigenous people have depended on the ocean for a millenia, but climate change is causing less predictable storm surges and coastal hazards, affecting marine safety, water quality, coastal erosion, and food security.

Community-accessible Tech: Spotter buoys



Our solution: Indigenous community-driven stewardship of lower cost, user-friendly technology to provide real-time wave data, adaptable for other ocean data needs.

Challenges = Opportunities

- Limited human capacity and financial investment
- Demand for community autonomy
- Need for wave data to be easy to access and understand

Together we are **co-designing:**

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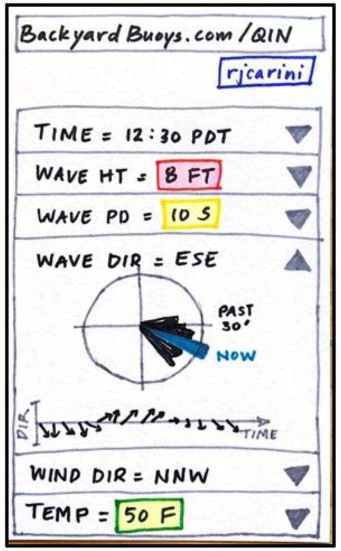
A Community-led Plan for

- Implementation
- Stewardship

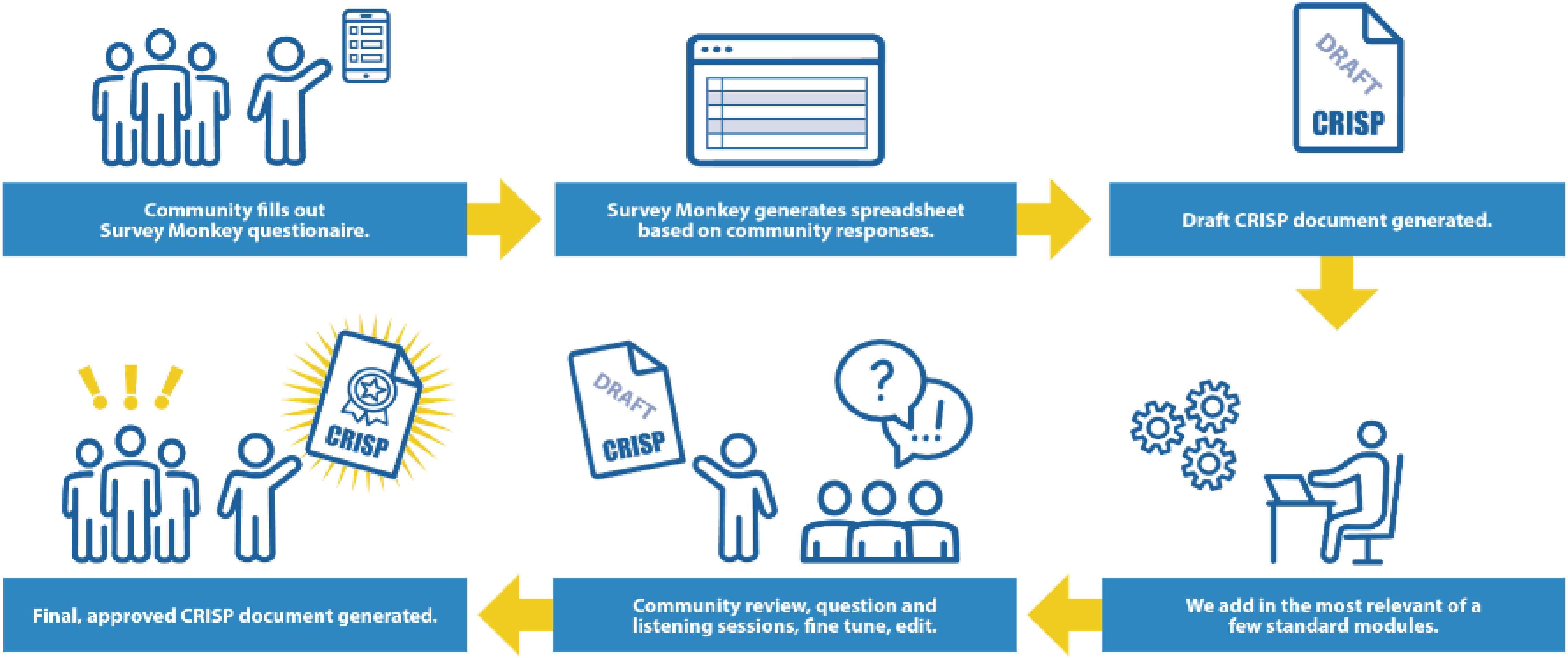
- Data delivery apps



- Bridge to Indigenous knowledge
- Education modules

United Nations Decade of Ocean Science for Sustainable Development calls to "***promote a more targeted and effective information flow*** as well as ***innovative ways of conducting and using ocean science***."

Community Research and Implementation Stewardship Plan



Co-Production: A process that takes time and requires trust

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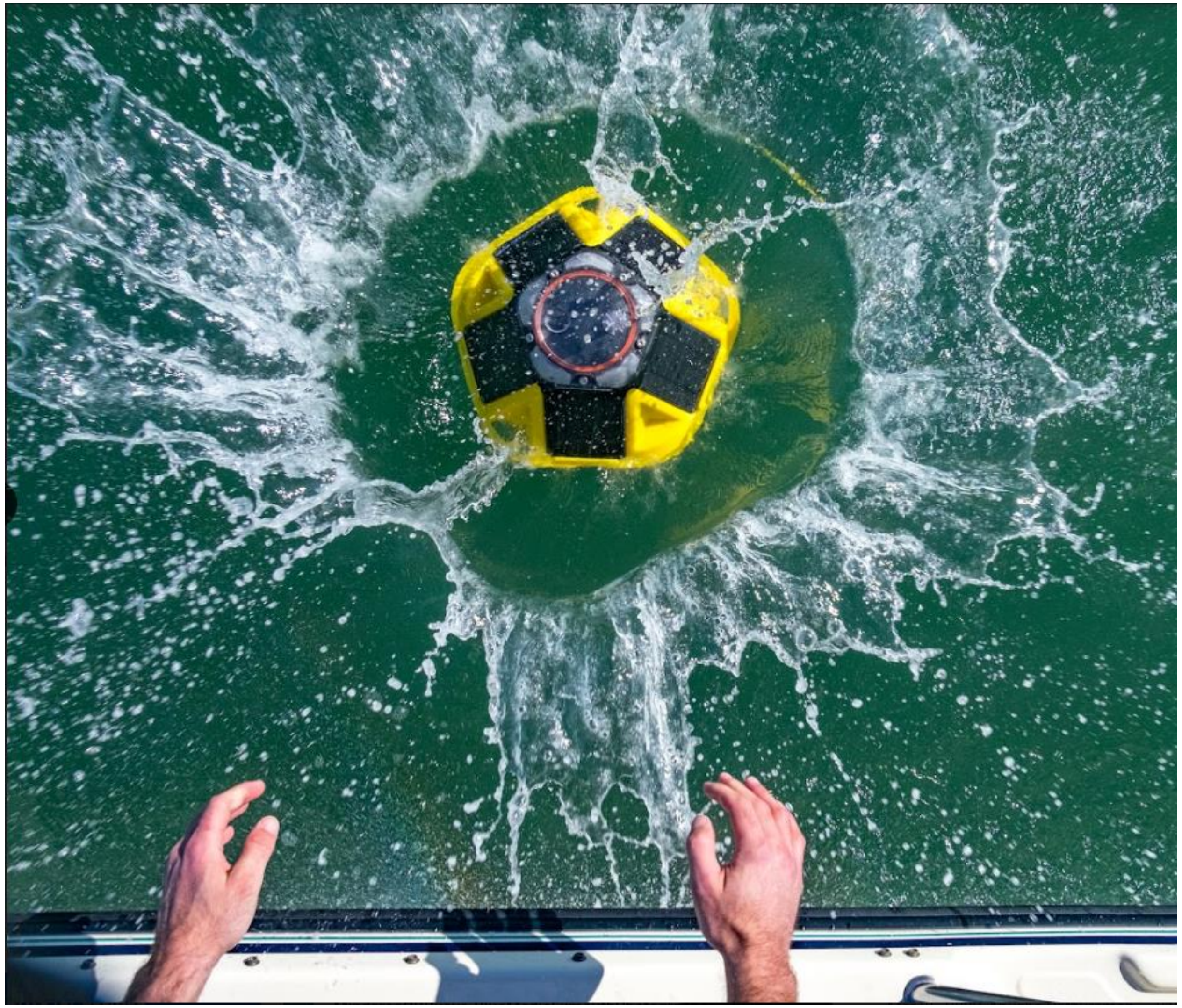
Co-production process defined by the following guidelines:

- Respect
- Relationship building = SUCCESS
- Learn to speak in a way that partners understand
- Phrasing questions to create meaningful dialogue
- Flexibility in methods used to collect information
- LISTENING = LEARNING

Backyard Buoys will succeed because…



www.backyardbuoys.org

- It is needed
- It is now possible
- It can be sustained
- The cost of waiting is too high
- The seas are already changing

Review of Year 1: NSF Convergence Accelerator

- Launched by NSF in 2019 to solve national societal challenges by converging or merging on innovative ideas, technologies, etc.
    - Use-inspired and application-oriented
    - Integrates teams across different disciplines and organizations
    - Currently: 7 tracks funded
    - We are part of Track E: Blue Economy
- This is NOT a typical NSF grant!!
    - NSF curricula & meetings
    - Annual meeting to present update
    - Expo in July of each year (virtual exhibit hall)
    - Open to changing of “product” based on feedback
    - Opportunities for investment through track integration for sustainability

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NSF’s Convergence Accelerator

UPDATE: FUNDING!

- **USD5M**
- **2 years**
- **Around 80 wave buoys to be purchased and deployed**
- **Interviews in all 3 regions**
- **Co-design of the**
  - **Implementation plan (CRISP)**
  - **Data deliverables: web portal, app, text-a-buoy**
- **Education Program**
- **White paper?**

Phase II (simplified) Timeline and Deliverables

BACKYARD BUOYS

Outcomes

CRISP

CRISP tool- developed

-CRISP building and implementation

*Increased autonomy and ownership of ocean data

Buoy Ops

Community-owned wave buoys- assessed

-50% deployed

-100% deployed

*Community-led stewardship of wave buoys

Data Access Tools

Apps- **developed**

-Refined

Data integrated into portals

*Communities using wave data to make decisions

Co-Design and Engagement

Training Modules-

- developed

-refined

-implemented

*Increased community capacity in buoy operations

Education

Curricula- developed

-test with educators

-implemented

*Youth learning with their buoys

Sept 2022 | **Mar 2023** | **Sept 2023** | **Mar 2024** | **Sept 2024**

First workshop: August 2022

BACKYARD BUOYS

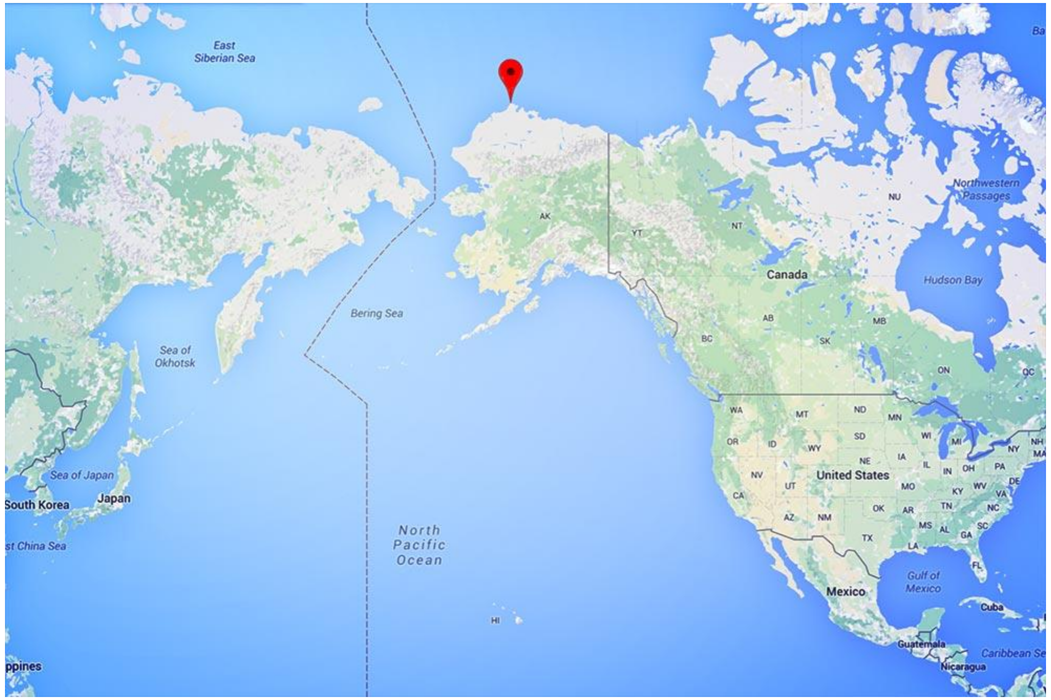
Barrow (Utqiaġvik)

•**Alaska:** Alaska Ocean Observing System (AOOS), Alaska Eskimo Whaling Commission (AEWC), University of Alaska Fairbanks (UAF), Alaska Department of Natural Resources (ADNR), and Alaska Native Science & Engineering Program (ANSEP).

•**Pacific Northwest:** Northwest Association of Networked Ocean Observing Systems (NANOOS), Quileute Tribe, Quinault Indian Nation, Western Washington University (WWU).

•**Pacific Islands:** Pacific Islands Ocean Observing System (PacIOOS), Marshall Islands Conservation Society (MICS), National Park of American Samoa (NPSA), Hawai´i Sea Grant, Conservation International Hawai´i.

•**Sofar Ocean Technologies**



First workshop: August 2022

BACKYARD BUOYS

2 days of open conversations and feedback from whaling captains and local community members
Technology demonstration
Virtual attendance of Dr Rick Spinrad (Head of NOAA)
Sharing of traditional knowledge between communities from Samoa and Alaska

First workshop: August 2022

First workshop: August 2022

Scientists Providing Hyperlocal Data For Tides, Floods, and Sea Level Rise

Hohonu

Democratizing Access

To Ocean-Observing Technology

Over 40 years experience

Deploying Environmental Sensors

$3.5m funding

From National Science Foundation, NOAA, and Schmidt Technology Partners

350,000+ Hours of Water Level Monitoring

Hohonu

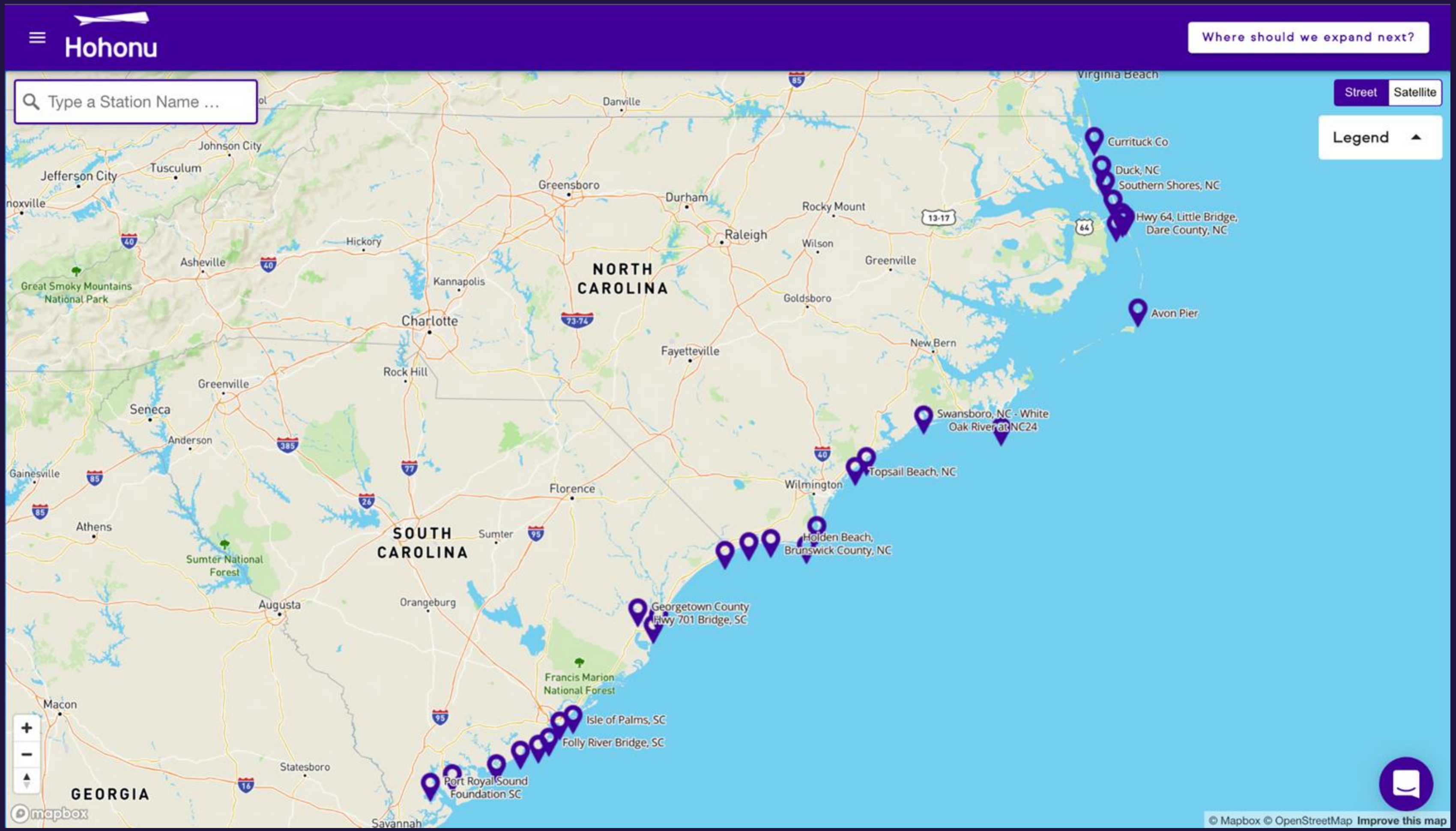
350,000+ Active Monitoring Hours Since 2021

40+ Active Locations

In Partnership With NOAA, 60 Municipalities

SECOORA
Southeast Coastal Ocean Observing Regional Association

asbpa
American Shore & Beach Preservation Association



Collect, Analyze, Deliver Water Data

Hohonu

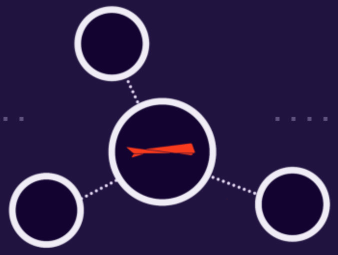
USD3,100 / Year

1) Data Collection

- 10x cheaper
- Solar-Powered
- No Required Infrastructure
- Can Last Years Without Maintenance

2) Data Analysis

- Tidal Predictions
- Flood Mapping
- Sea Level Rise Benchmarking



3) Data Distribution

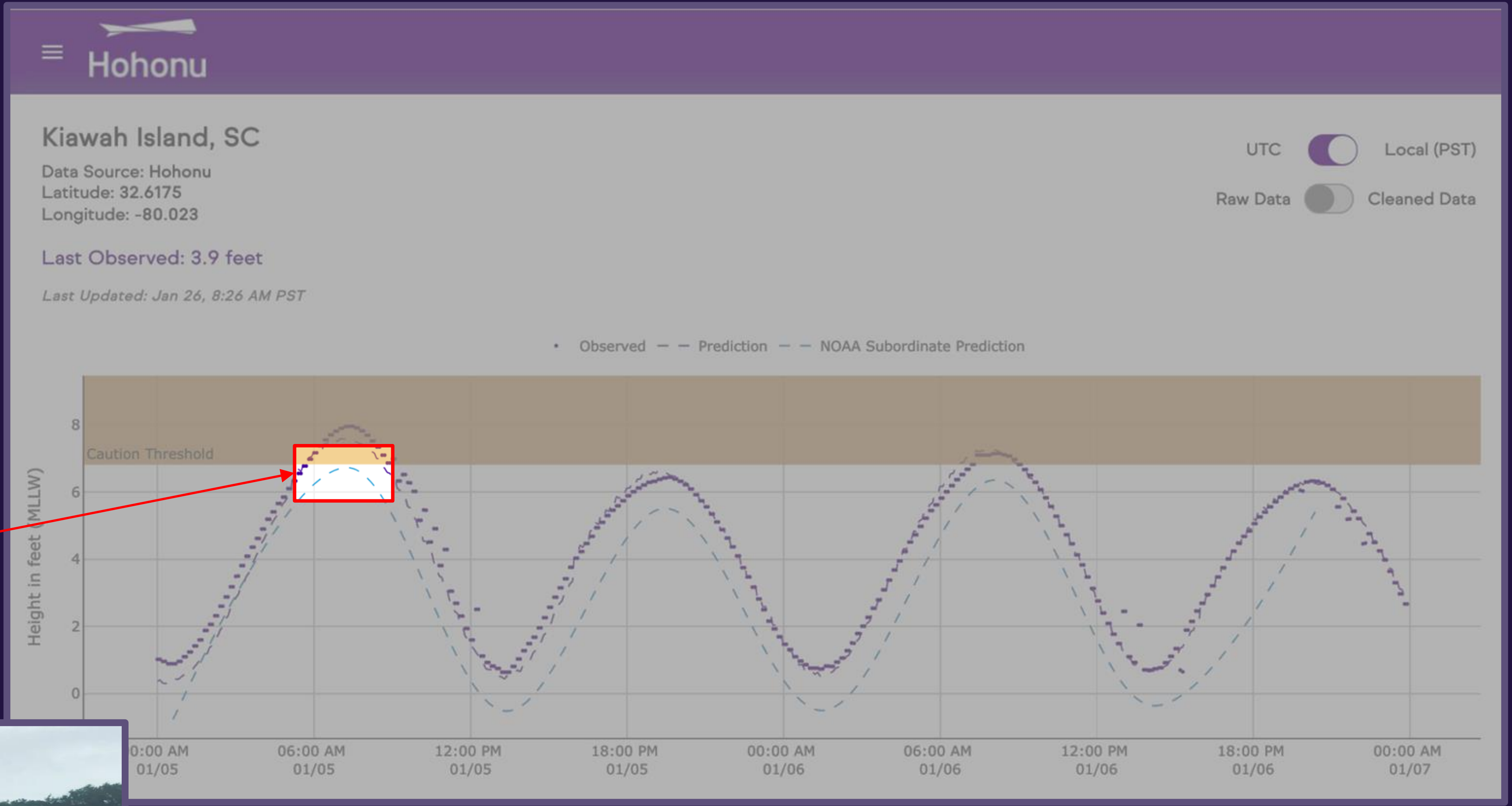
- Online Portal
- API Access

Example - Sunny Day Flooding

Hohonu

Previously, the town only had access to a prediction from NOAA

In this Jan 2022 example, NOAA's prediction was incorrectly below the safety threshold



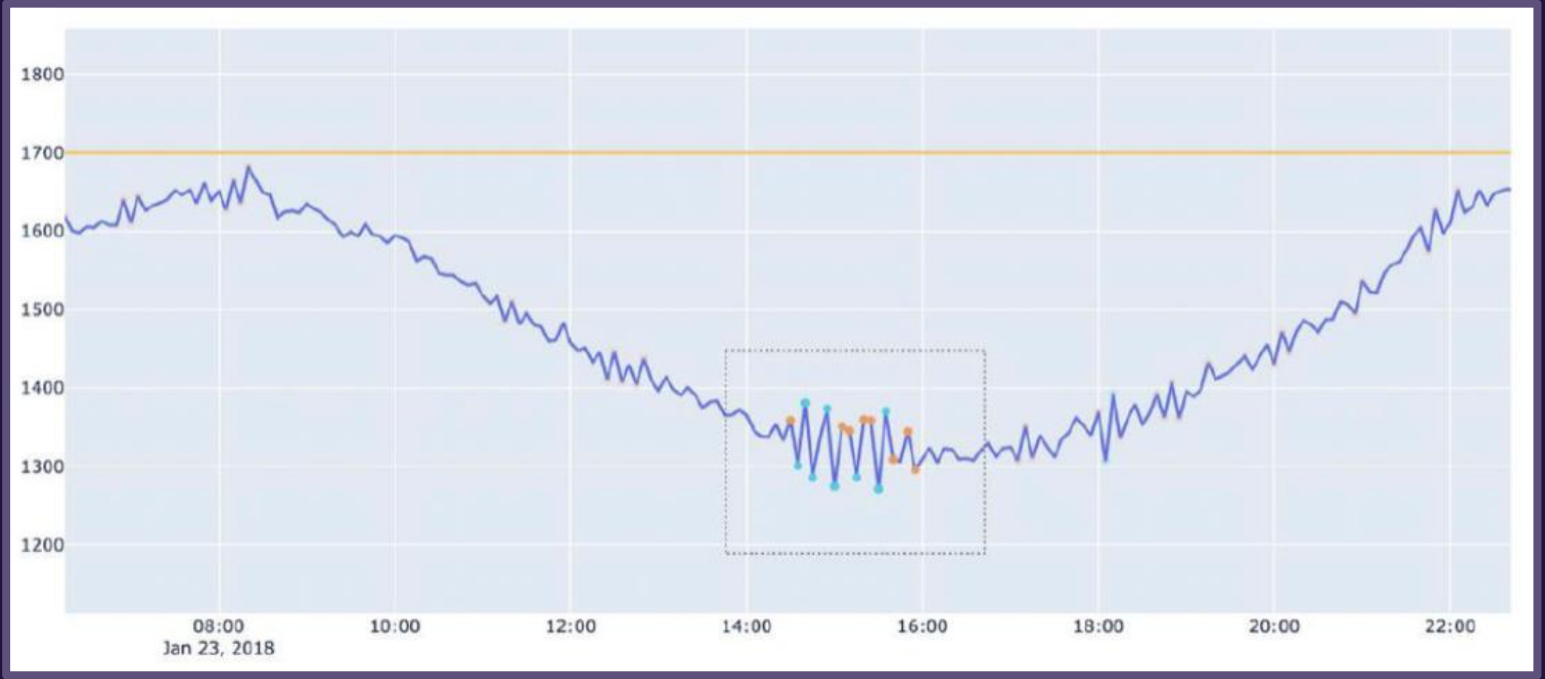
Kiawah Island, SC is now using Hohonu data to pre-emptively close roads

Example: Tsunami Monitoring & Detection

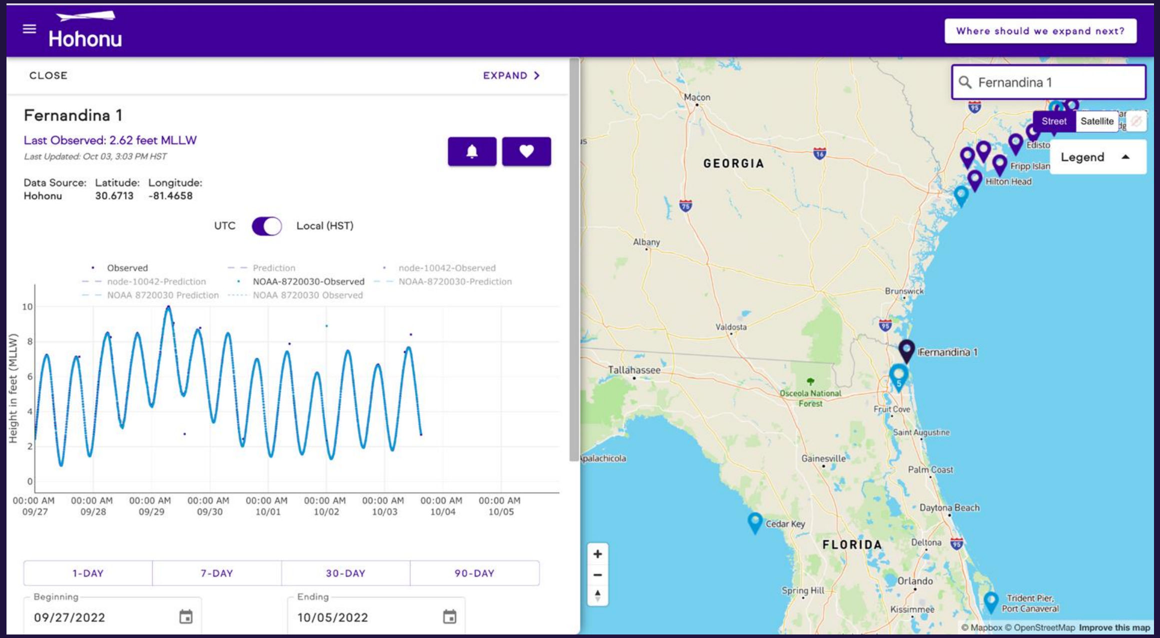
Hohonu

Hohonu data undergoes proprietary real-time data validation and analysis, based upon Federal data standards (QARTOD).

These algorithms automatically triggered detection of a ~10cm tsunami in Hawai'i in 2019



Hurricane Ian – NOAA Benchmarking

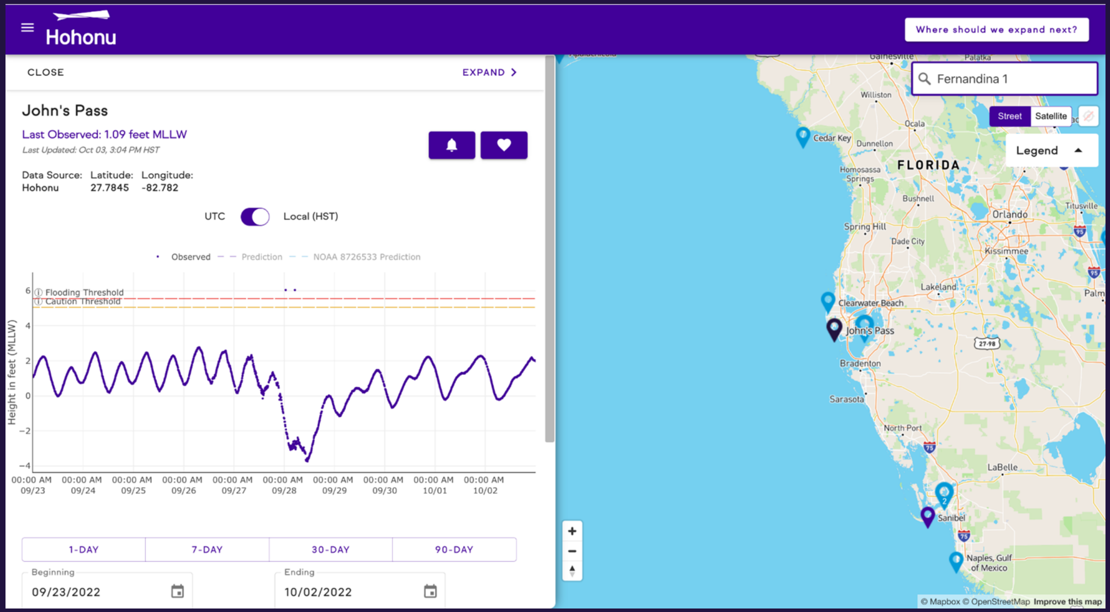


Hohonu

NOAA

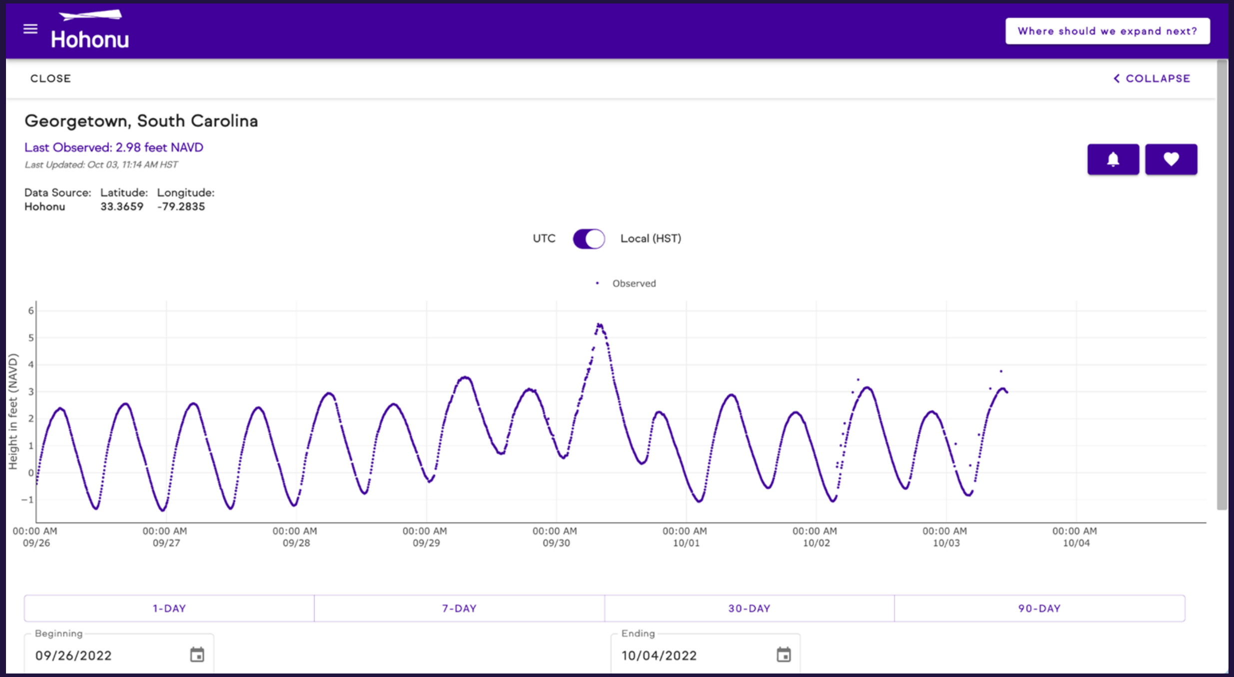
Hohonu's captured data in Fernandina, FL are directly overlapping to NOAA"s station located at the same site

Tampa Bay - Water Sucked Out Of Bay



Ian caused water to be sucked out of Tampa Bay and directed south, which was captured by Hohonu's sensor in John's Pass

Georgetown, South Carolina



"Luckily the SC Maritime Museum escaped having water in the building but it was a close thing. We were fortunate to have the camera and tide level sensor as we were able to monitor the situation, as best we could, remotely during the storm."

- ***South Carolina Maritime Museum***

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