

National Strategy for a Sustained Network of Coastal Moorings

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10/25/2017

Motivation behind the Strategy

- Sponsored buoys: Funded from other NOAA Line Offices or other agencies; not part of the NWS backbone.
- Sponsored buoys no longer supported
 - 46089 Tillamook, OR (Coastal Storms Program)
 - 41012 St. Augustine, FL (Coastal Storms Program)
 - 41036 Onslow, NC (CORMP)
 - 41009 and 41010 Cape Canaveral, FL (NASA)

It has come to the attention of [SECOORA] that Cape Canaveral buoys 41009 and 41010 are scheduled to be removed. This would cause a significant degradation to the nation's vital coastal ocean observing systems ...

VADM (ret.) Conrad Lautenbacher, Ph.D. SECOORA Chairman, and former Under Secretary for Ocean and Atmosphere and NOAA Administrator



- Congressional language for FY16 encouraged NOS to collaborate with NWS to prioritize buoy management, observations and repair.
- Pressure from NOAA to determine plan
- Zdenka Willis (IOOS) and Joe Pica (NWS) committed to an overall coastal moorings plan.

Development

- Small writing team, with a goal to identify a critical network of existing moorings.
 - Kathy Bailey (co-lead, IOOS)
 - Shannon McArthur (co-lead, NDBC)
 - Teresa Murphy (NWS)
 - Steve Ruberg (GLERL)
 - Jan Newton (NANOOS)
 - Carol Janzen (AOOS)
 - Ru Morrison (NERACOOS)
 - Uwe Send (Scripps)
- Determined that a robust plan requires regional stakeholder input on observing requirements
- Developed a Strategy to describe the framework of the plan and required actions towards a plan.
- Published: January, 2017



The Vision and Goals

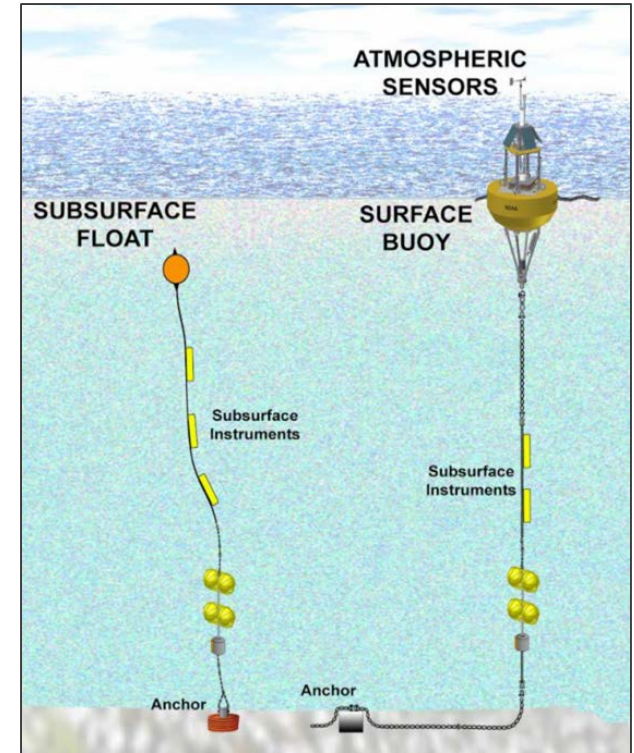
*“a **sustainable** national network of coastal moorings integrated with other ocean observing systems to improve management of resources, safety of life, protection of property, enhancement of the economy, protection of the environment, and science and information about the Earth system.”*

- Ensure the preservation and implementation **continuity**, transparency, and **public availability** of critical integrated coastal and ocean observations;
- Define a **framework** for guiding the continued planning and build-out of a sustained coastal moorings network; and
- **Justify the need** for a core sustained network of federal and nonfederal coastal moorings that adheres to national and international data standards and best practices.

Scope

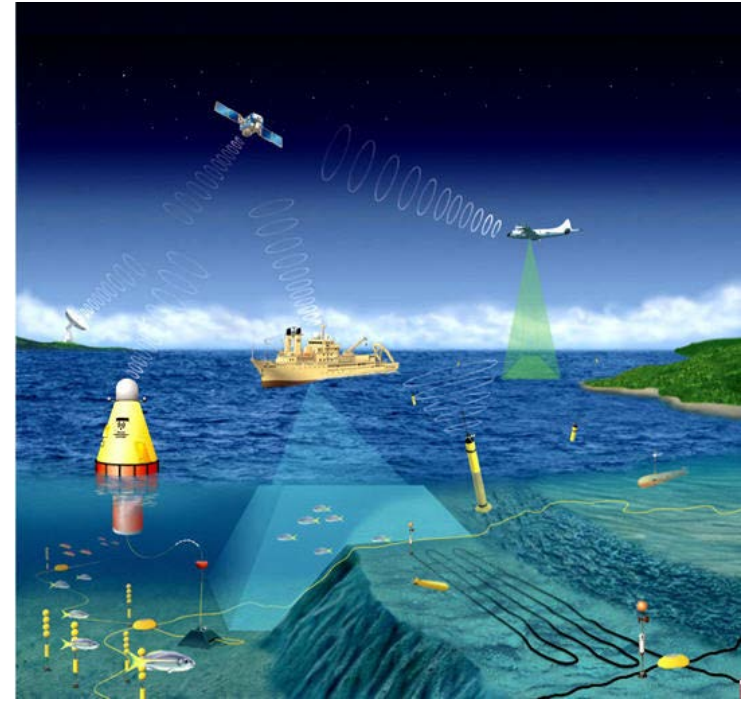
- Geographic: Head of tide to U.S. EEZ
- Federal networks
- Nonfederal coastal moorings served up through IOOS Regional Associations
- Sustained observations (vs experimental)
 - Observations taken routinely, for 7+ years
 - Includes Research & Operations
- Does not include shore-based stations (C-MAN, NWLON)

An asset that is anchored to the sea or lake bed, and provides time-series measurements at the water surface or at one or multiple depths within the water column.



Supports National Strategy and Planning

- *The National Operational Wave Observation Plan*
- *Toward a U.S. IOOS Underwater Glider Network Plan*
- *A Plan to Meet the Nation's Needs for Surface Current Mapping*
- *The National Ocean Policy Implementation Plan - White House OSTP*
- *NOAA's Next Generation Strategic Plan*
- *The National Plan for Civil Earth Observations - White House OSTP*
- *NOAA RESTORE Act Science and Monitoring Plan for the Gulf of Mexico*
- *Critical Infrastructure for Ocean Research and Societal Needs in 2030 - NAS*



- ❖ The Strategy is not a standalone document.
- ❖ Need to consider other complementary ocean observing networks.

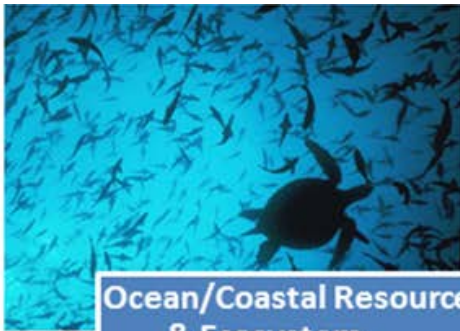
Connection to Societal Benefit Areas



Climate



Human Health



Ocean/Coastal Resources & Ecosystem



Coastal/Marine Hazards & Disasters



Water Resources



Reference Measurements



Coastal/Marine Weather



Energy & Mineral Resources



Marine Transportation

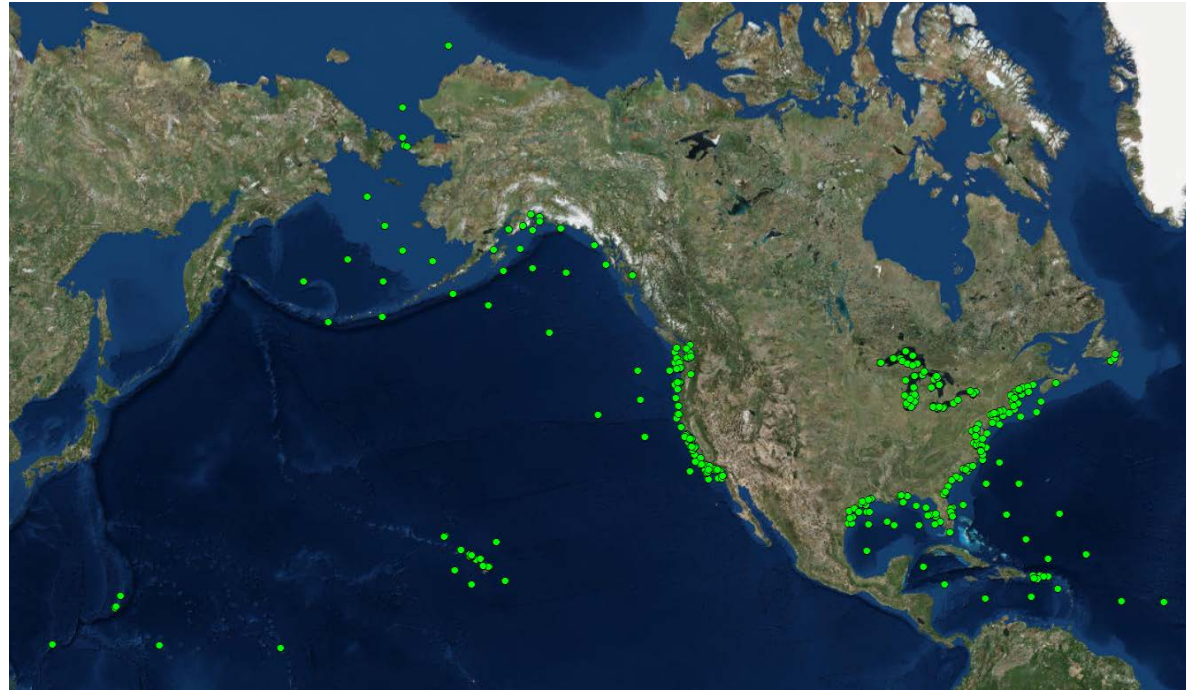
Networks within scope

Nonfederal moorings: 155

- IOOS RAs (143)
- NSF OOI (12)

Federal moorings: 215

- NOAA NDBC (106)
- USACE CDIP (48)
- NOAA PORTS (22)
- NOAA GLERL (16)
- NOAA OAP (5)
- NOAA CBIBS (10)
- NOAA EcoFOCI Program (4)
- OAR/PMEL Carbon Program (4)



370 moorings



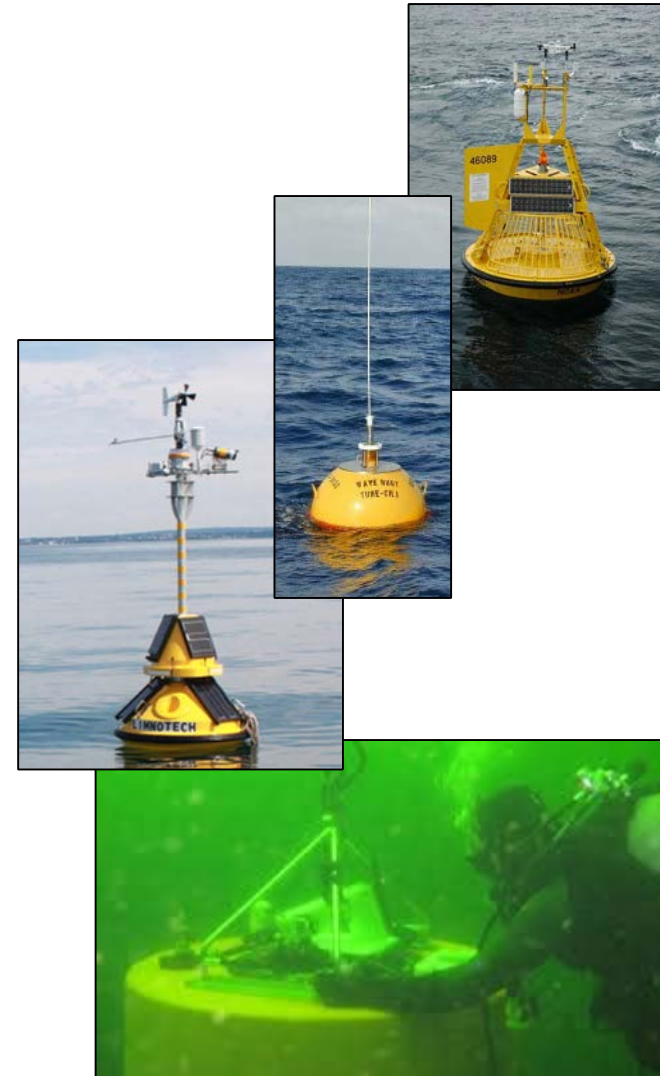
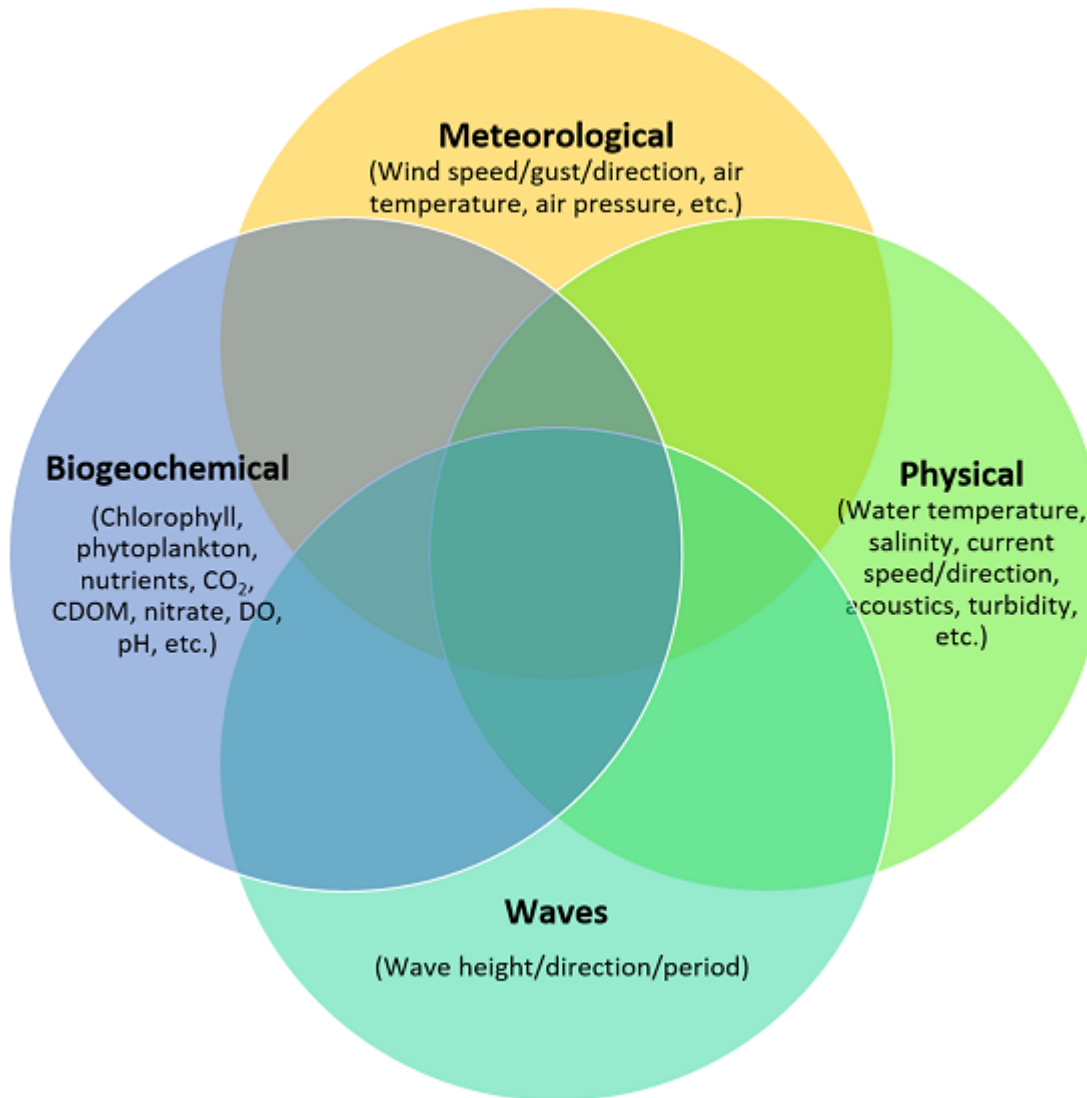
High-level Regional Analysis

7 major regions:

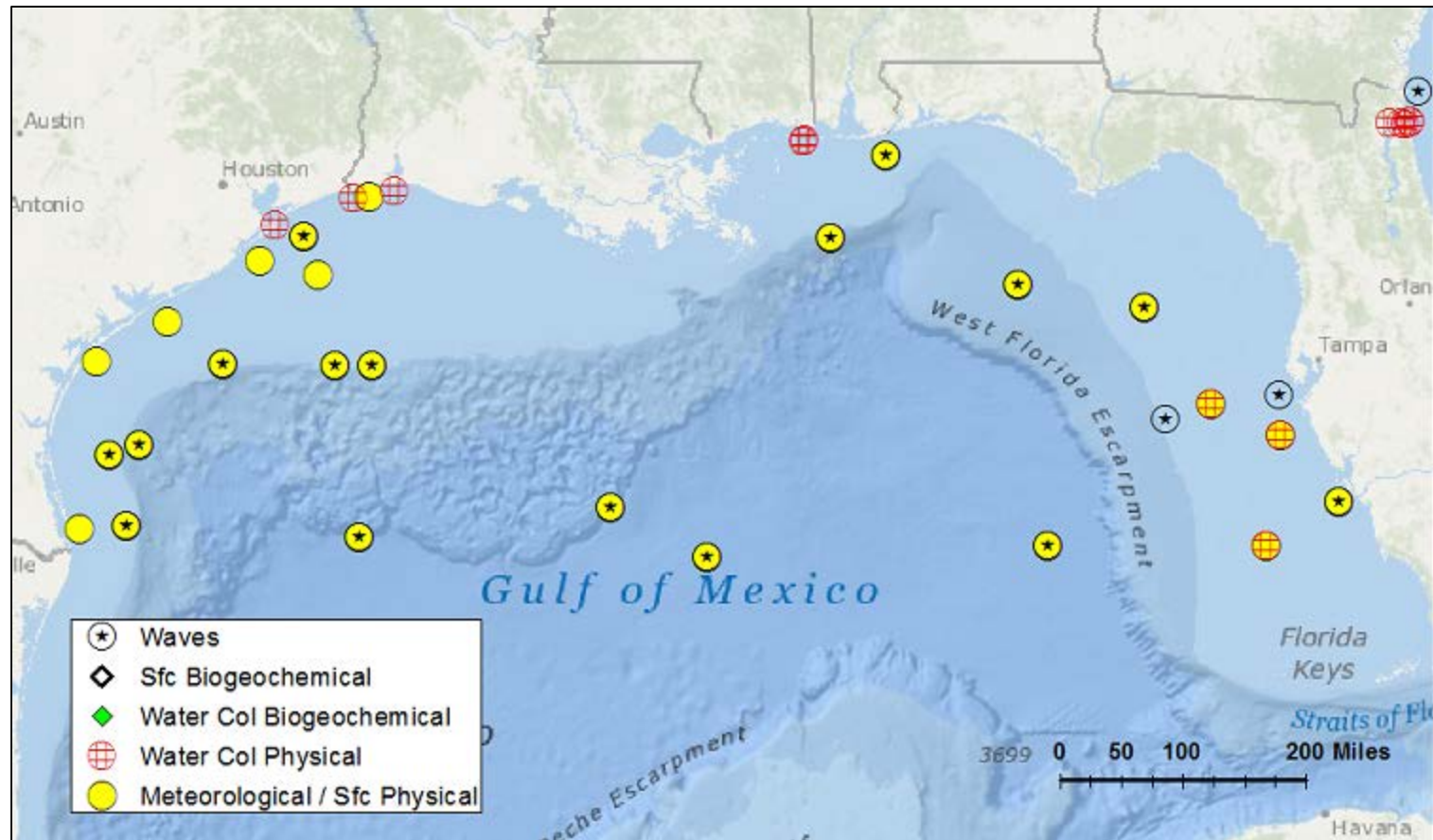
- Atlantic Coast
 - Northeast
 - Southeast
- Gulf Coast
- Caribbean Sea
- Pacific Coast
 - Pacific Northwest
 - California
- Pacific Islands
- Alaska
- Great Lakes



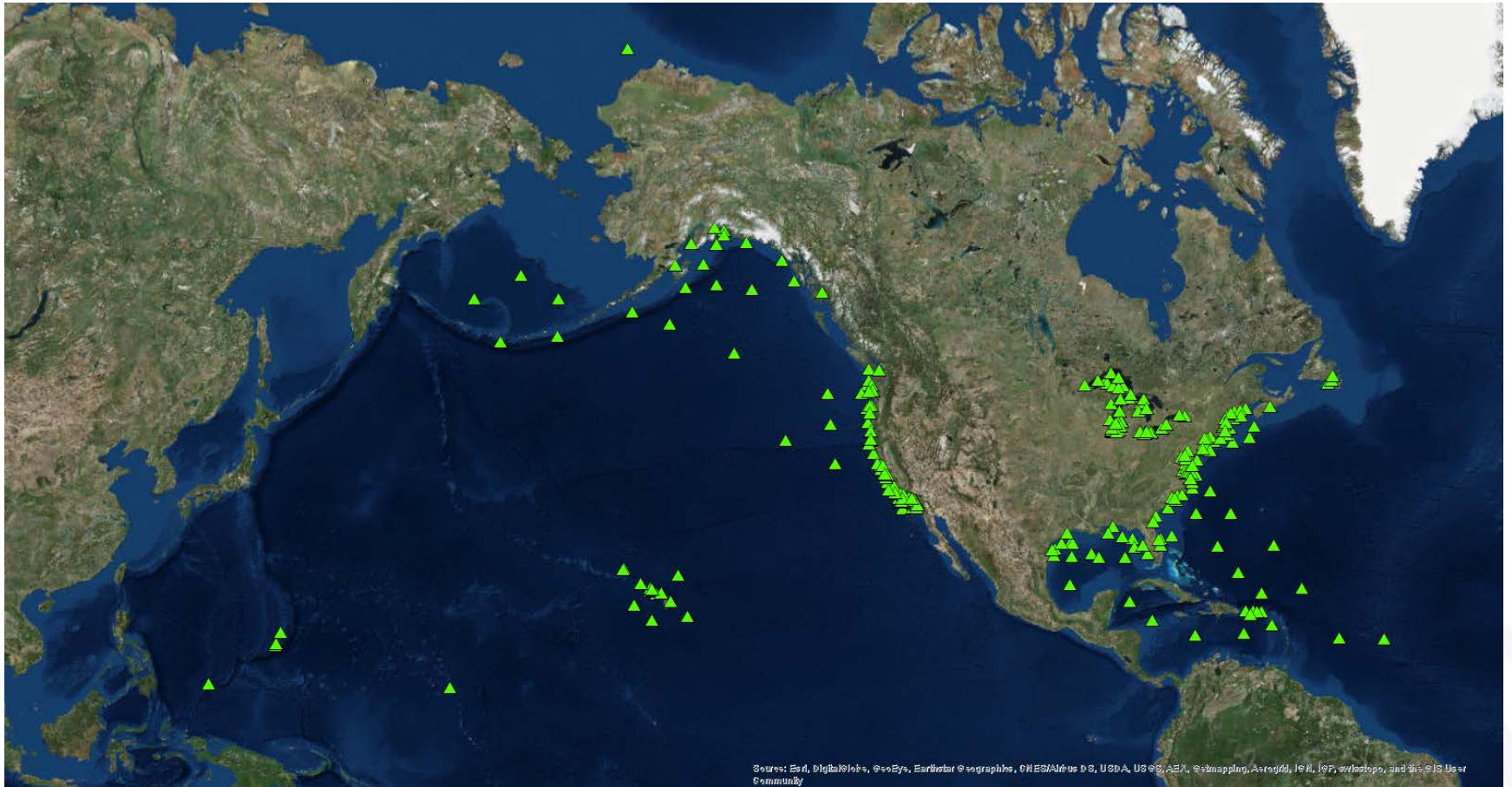
Major Observation Categories



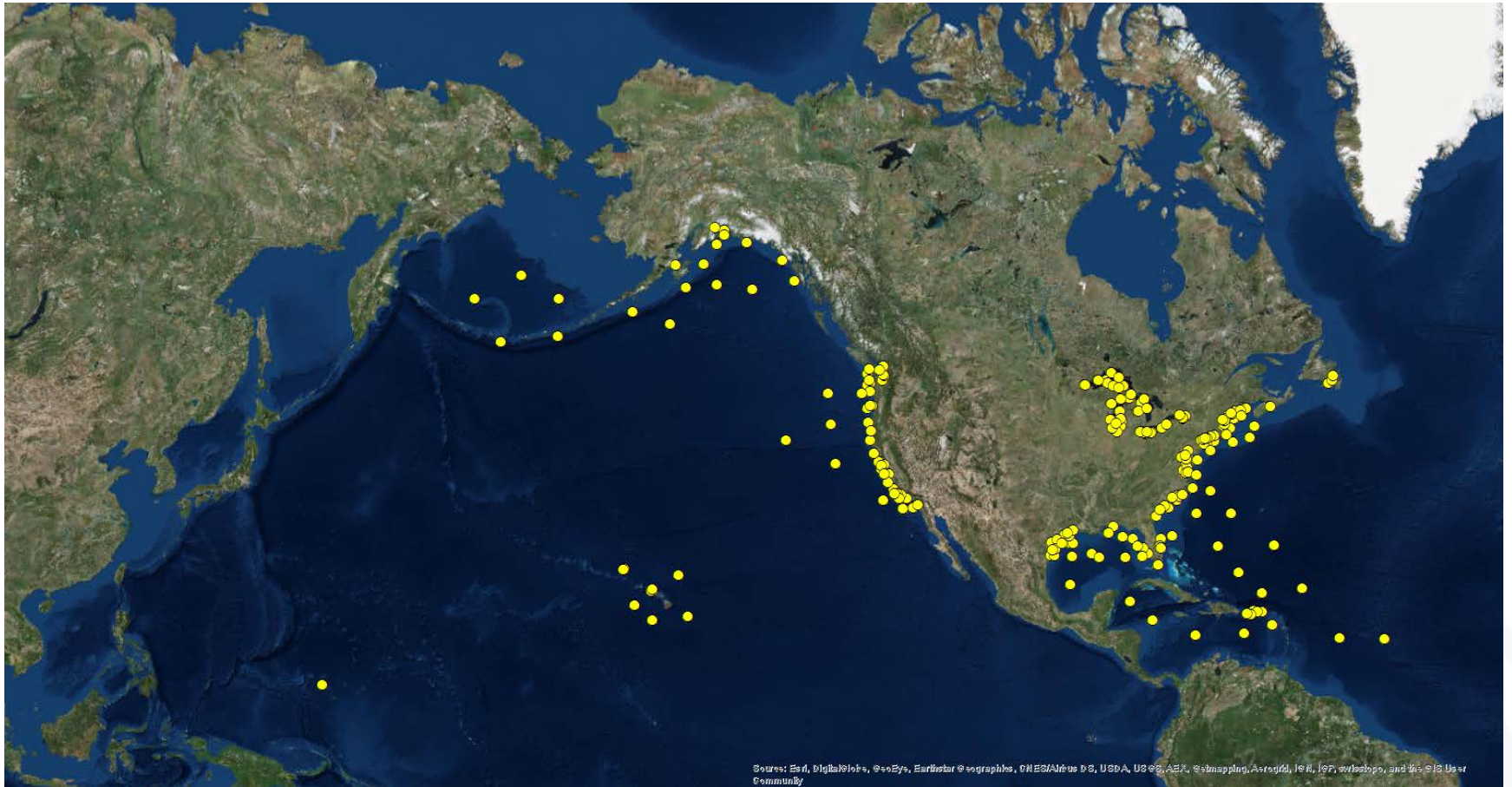
Regional Analysis – Gulf of Mexico



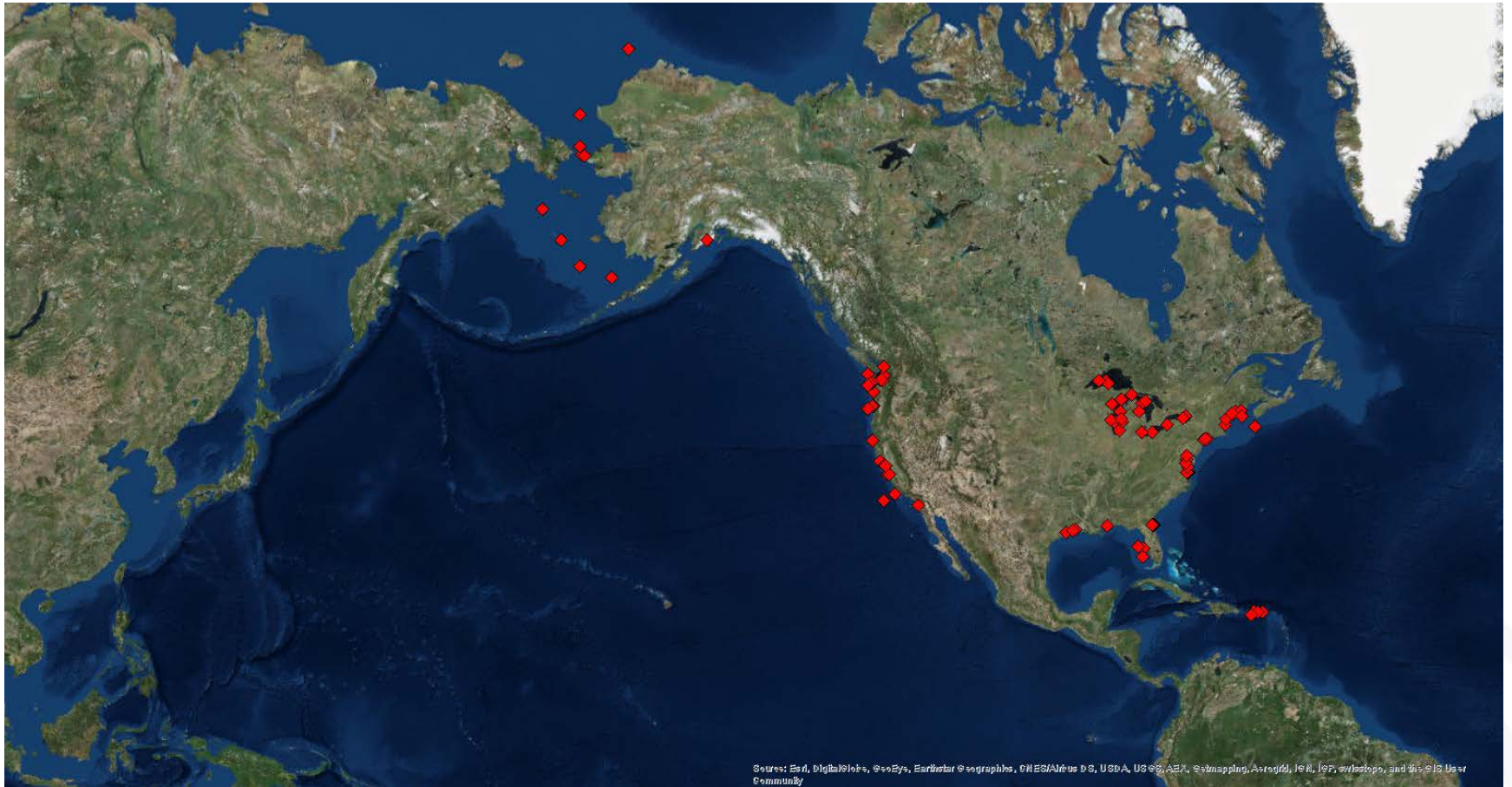
Waves (247)



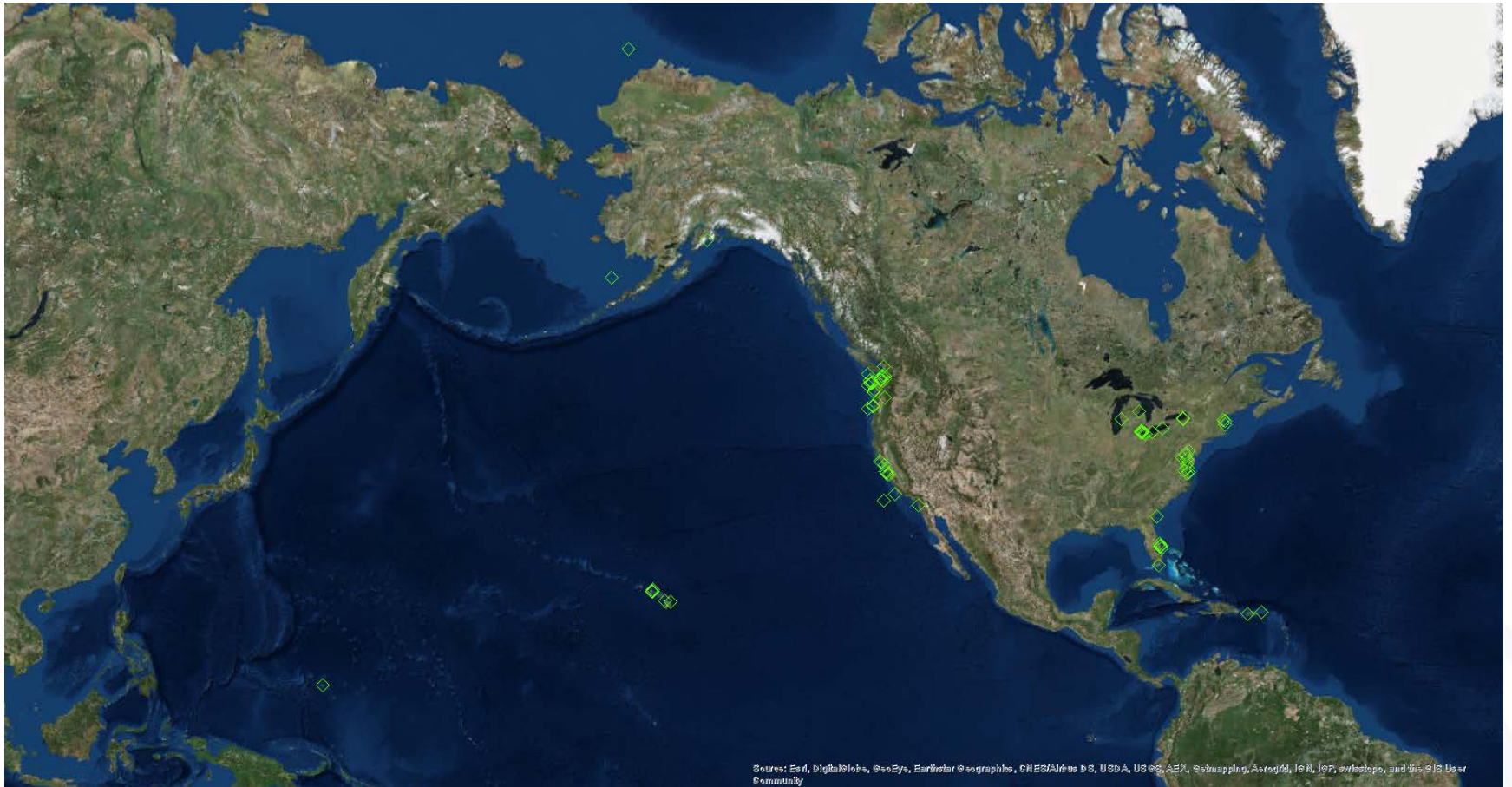
Meteorological (228)



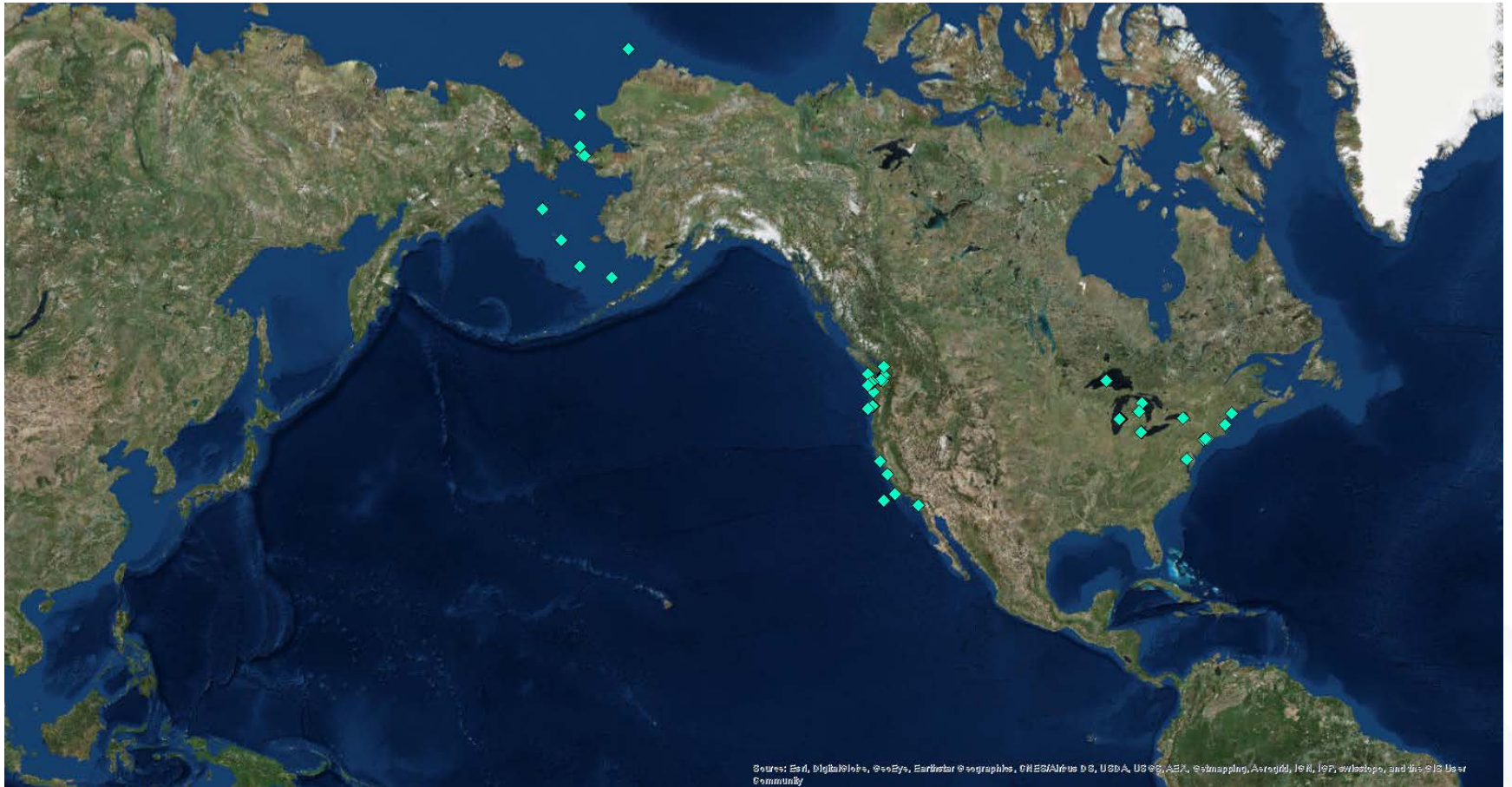
Water Column Physical (107)



Surface Biogeochemical (84)

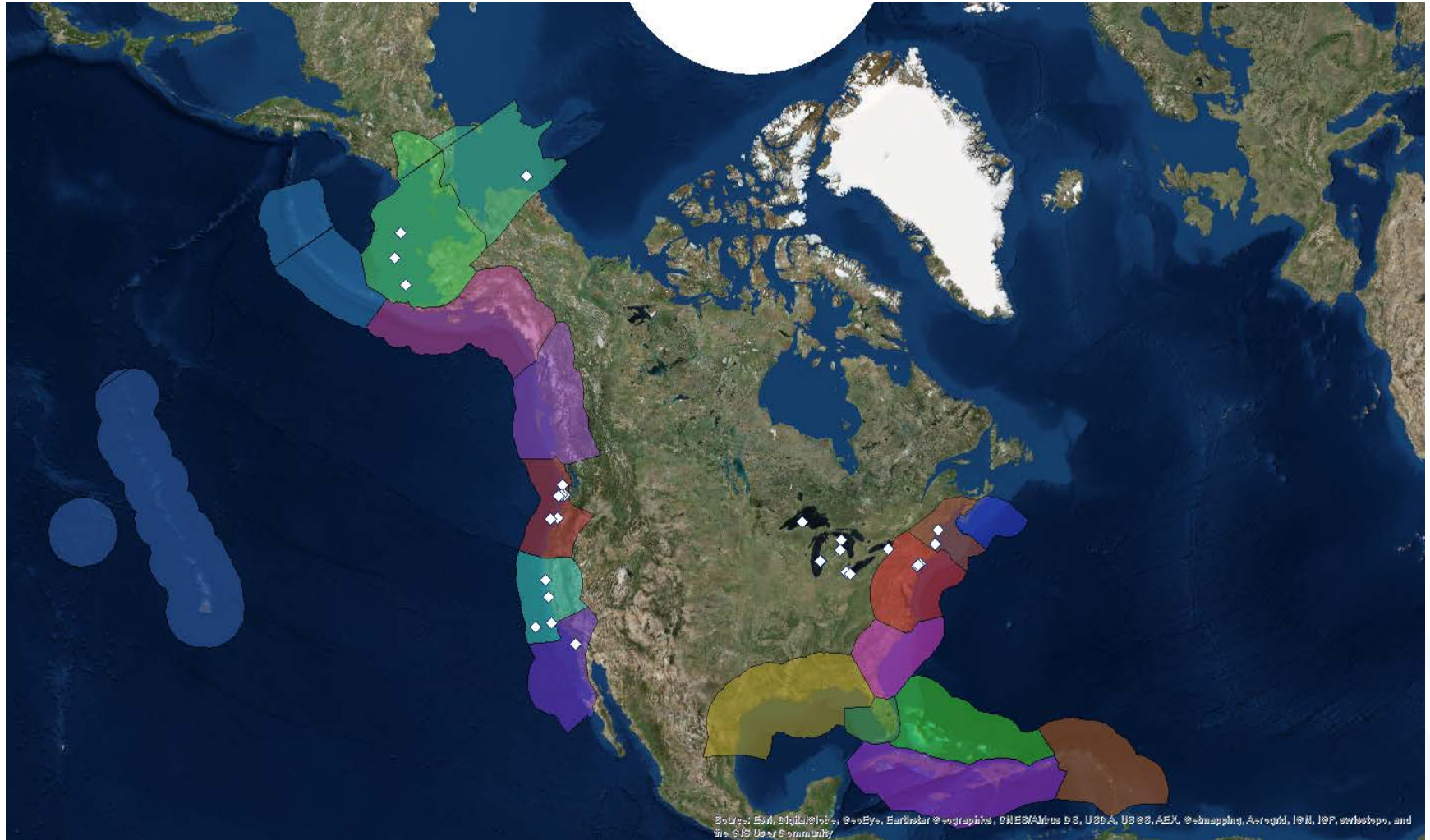


Water Column Biogeochemical (53)



Ecosystem Monitoring (35)

Physical (surface and depth) AND biogeochemical at ≥ 1 depth away from surface:



Marine Ecoregions of the World, Spalding, 2007

10 Recommendations

1. Develop an implementation plan with stakeholder input.
2. Identify mechanisms to sustain priority stations.
3. Consider complementary systems and emerging technologies in the development of a coastal moorings implementation plan.
4. Routinely monitor and assess the design of the national coastal mooring network.
5. Add water temperature and salinity measurements to designated existing NDBC mooring stations.
6. Identify and sustain water column ecosystem moorings at four to eight locations in each of the seven primary coastal regions of the United States.
7. Update and implement the National Operational Wave Observation Plan.
8. Promote environmental health and operational safety stewardship and regulatory compliance.
9. Develop coastal mooring network performance metrics.
10. Standardize and integrate data management best practices across coastal mooring networks.

Next Steps

- Plan regional stakeholder discussions on moorings locations, sensor configurations, implementation of the 10 recommendations
 - ~1 year to plan/engage
- Capture implementation actions in a National Plan
 - ~1 year to write
 - Federal Register Notice
- NOT intending to add every sensor type to every mooring
- Striving to make the existing network more efficient, and observing capabilities from moorings more efficient.

Stakeholder Sessions

- Timeline: ~ 1 year
- RA Exec Director (or designee) leadership
- Diverse participation; NOAA, RAs, local data providers from varied/diverse sectors.
 - Engage non-profits (ACT, Marine Tech Society)
- Leverage existing meetings/conferences/etc.
- A template to guide the discussion, ensure consistency.
- Virtual team review of recommendations and actions associated with each region, resources identified for each region.



National Ecosystem Moorings Workshop (ACT)

March 20-21, 2018 in Seattle, WA (University of Washington)

- 45-50 participants: RAs, federal (NOAA, USGS, EPA, USACE), private industry, academia

Goals:

1. Understand **use cases** for ecosystem moorings
 2. Exploration of **current and emerging sensors** to meet those requirements
 3. Summary of **technical** (e.g. power and telemetry) needs
 4. Summary of **deployment logistics, operation and maintenance**
 5. Identification of tiers/options for ecosystem mooring **configurations**, depending on the region and costs
 6. Discussion of **integration** (data management, communications, infrastructure) with other observing systems
- Will NOT identify locations/critical moorings at this workshop.
 - Output: White paper that would be used as a basis for the ecosystem moorings discussion in the Implementation Plan

Questions?

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Framework for Ocean Observing

Framework for Ocean Observing Process Diagram

