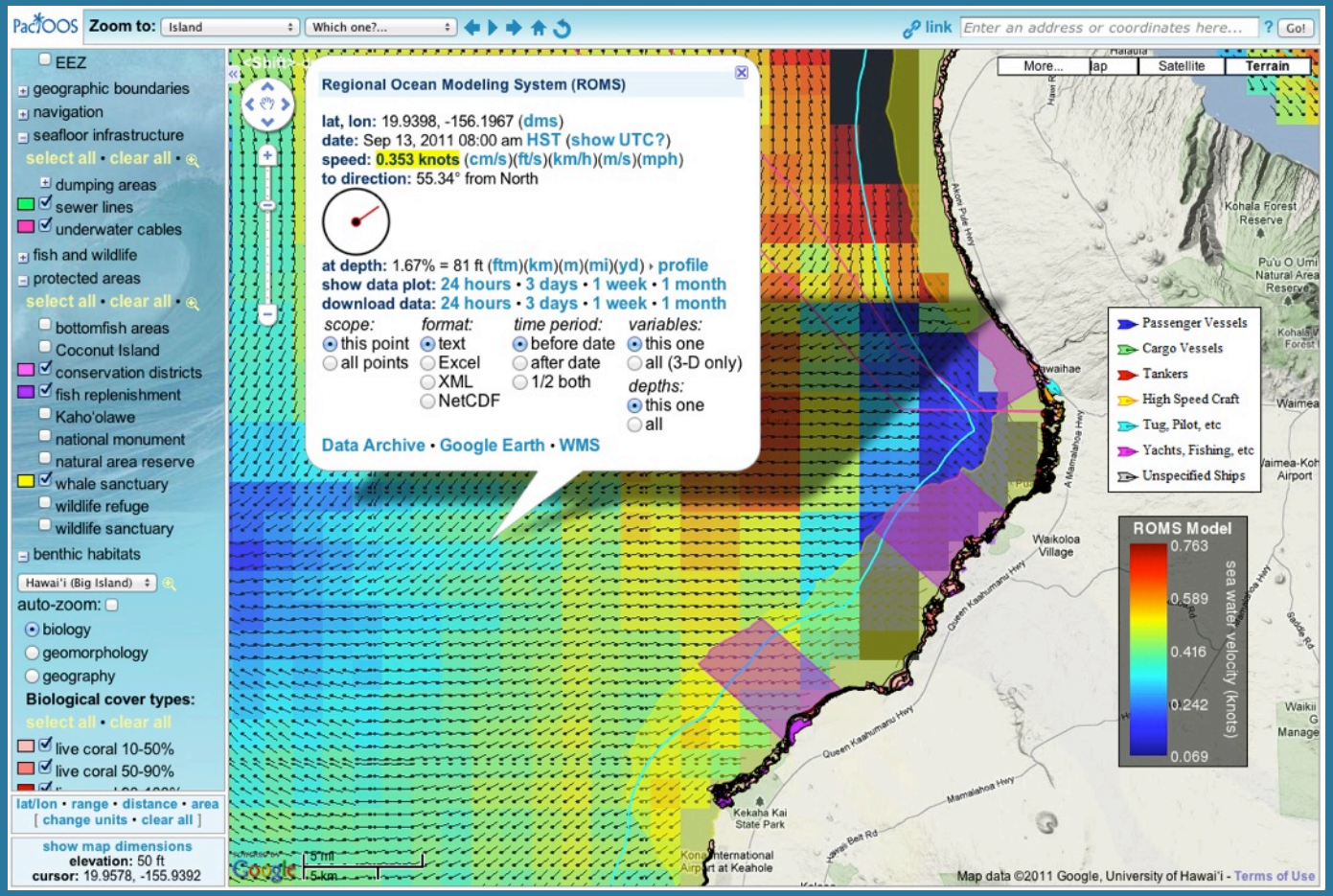
Data and Information Management through the Pacific Islands Ocean Observing System (PacIOOS)



A partnership among government agencies, NGOs, Industry, and academic groups to provide timely, reliable, and accurate coastal and open ocean information.

INTEGRATED OCEAN OBSERVING SYSTEM

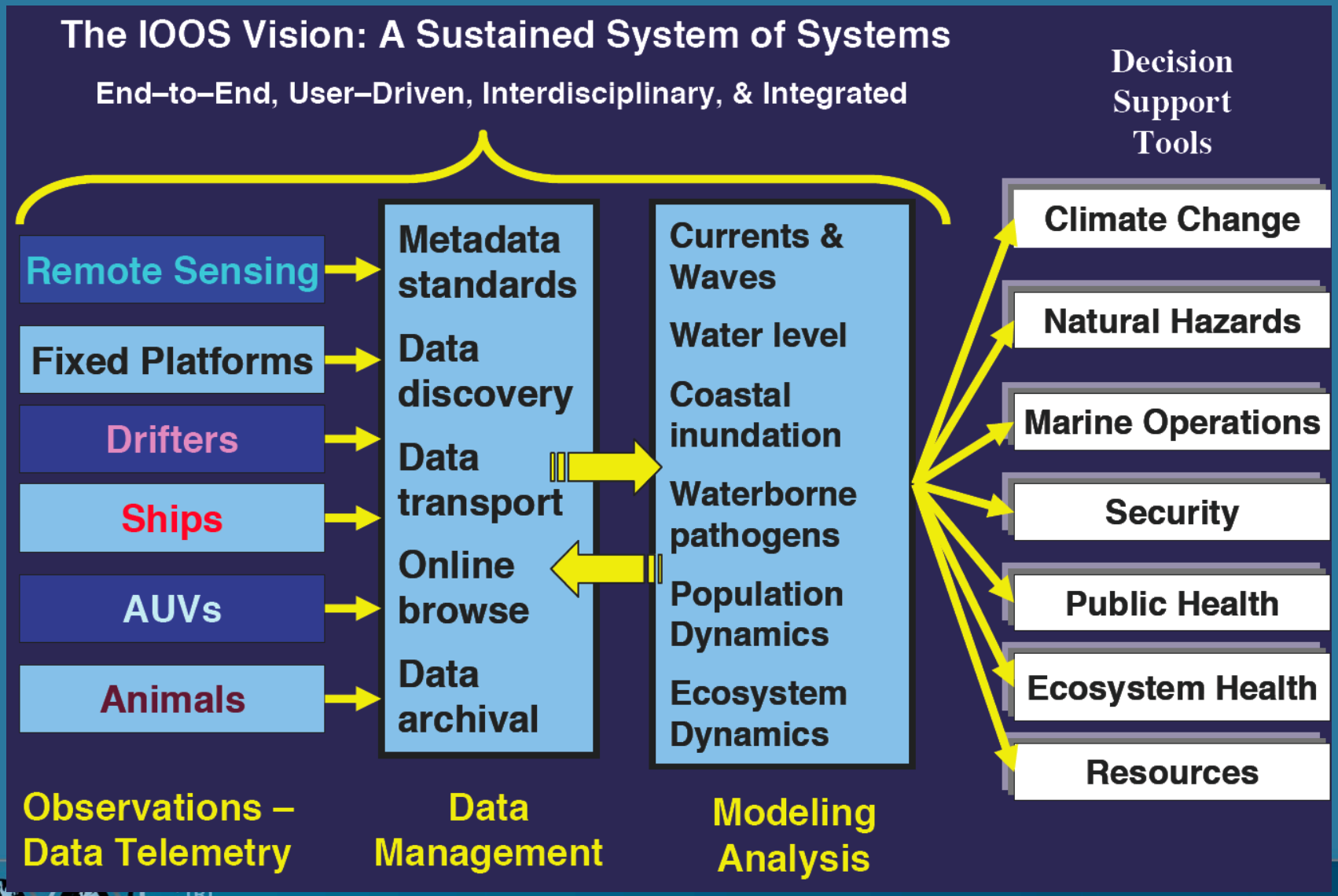
IOOS®

National IOOS Program – Mission

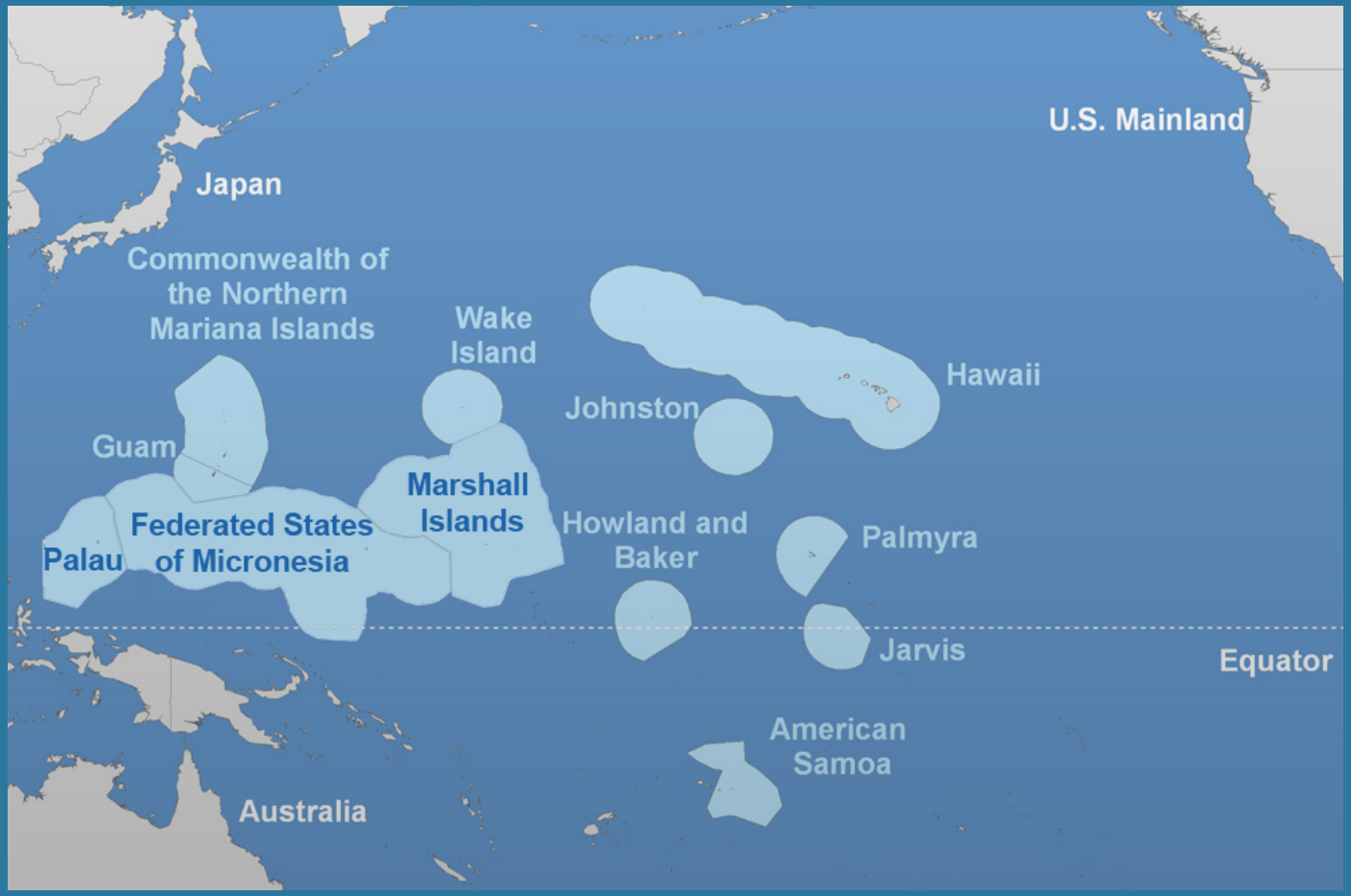
- IOOS® is a national program created to ensure the sustained observation of our nation's coastal oceans and to develop information products from those observations to assist people in their lives and livelihoods

- Marine operations
- Climate variability
- Ecosystems, fisheries, and water quality
- Coastal hazards
- Coastal and marine spatial planning

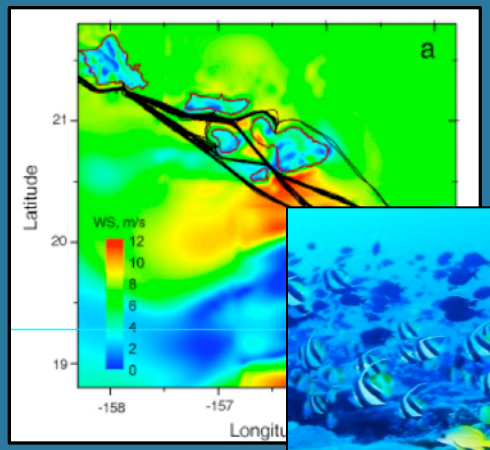
System Design



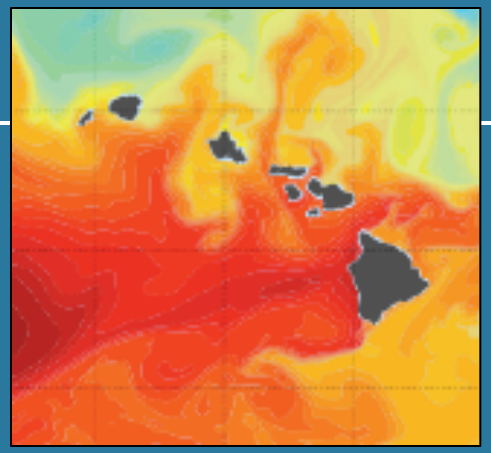
Pacific Islands Region



PacIOOS: Major Focus Areas



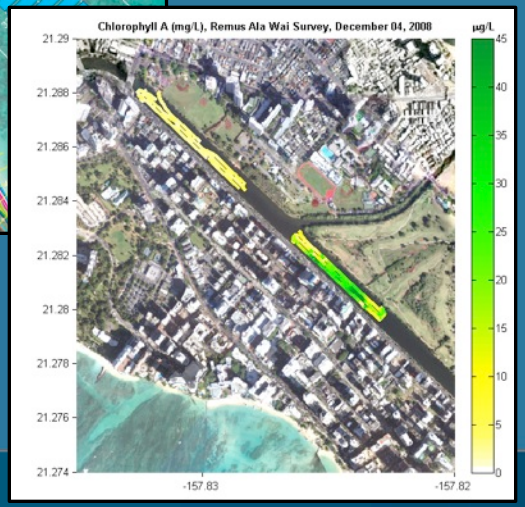
Marine Operations



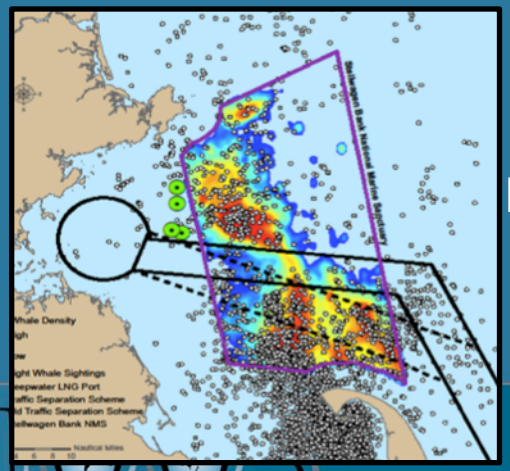
Numerical Modeling

Ecosystem Information

Coastal Hazards

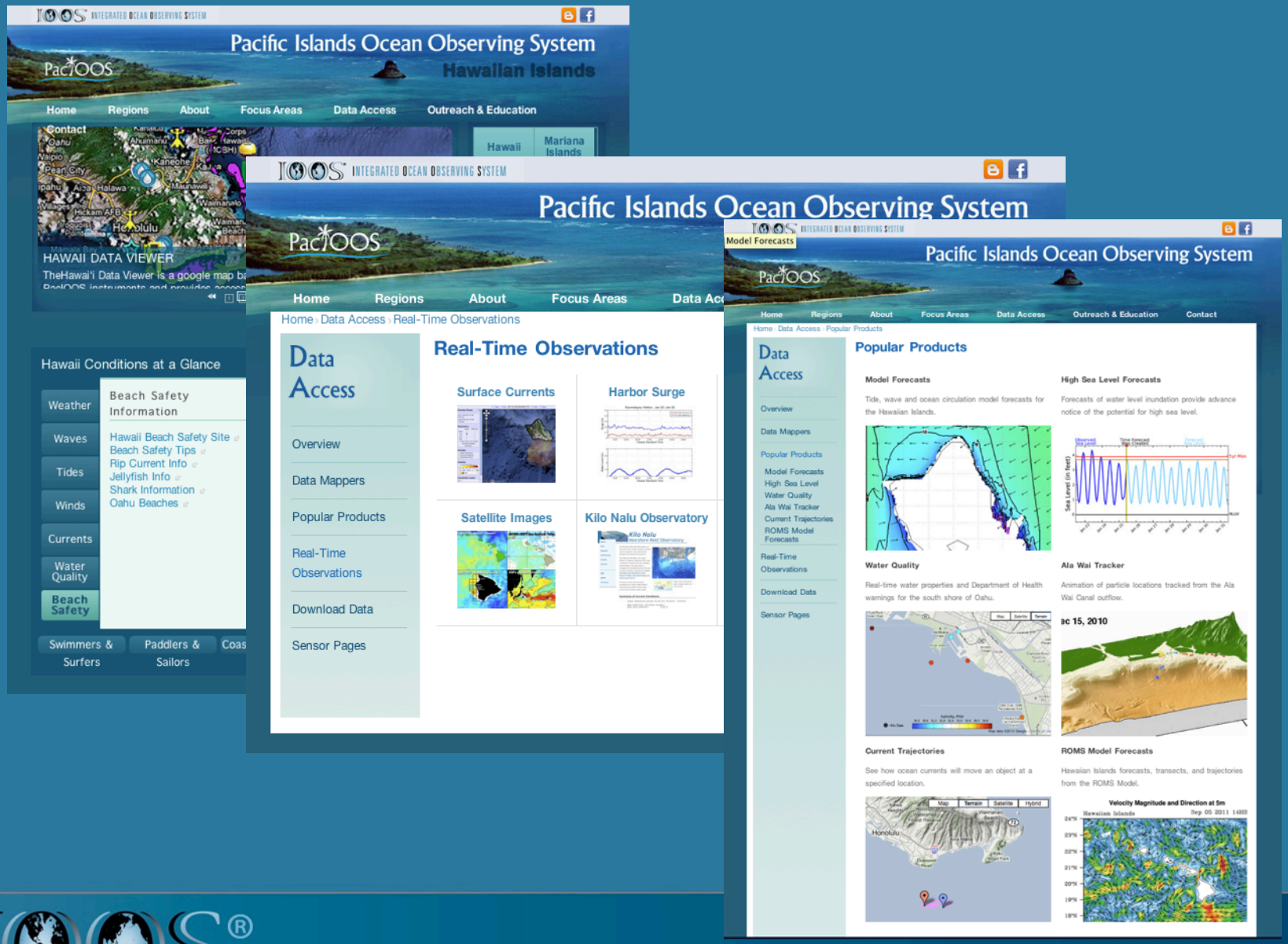


Water Quality



Data Management and Visualization

Data Management: Online Browse



Data Management: Data Discovery

IOOS INTEGRATED OCEAN OBSERVING SYSTEM

Pacific Islands Ocean Observing System

Click to see Make A Graph for this dataset.

ERDDAP > List of All Datasets

Or, Do a Full Text Search for Datasets: Search

Or, Search for Datasets by Category: institution, ioos_category, long_name, standard_name

Or, Search for Datasets with Advanced Search

Pick a Dataset

Grid DAP Data	Sub-set	Table DAP Data	Make A Graph	WMS	Title	Sum-mary	Meta-data Info	Back-ground Info	RSS	E mail	Institution	Dataset ID
data			graph	M	Chlorophyll-a, Aqua MODIS, NPP, Global, Science Quality (8 Day Composite)		meta	background	RSS		NOAA CoastWatch ...	erdMHchla8day
		data	graph		HiOOS Nearshore Sensor 1 (NS01): Hawaii: Ala Wai		meta	background	RSS		University of Hawaii	nss01_agg
		data	graph		HiOOS Nearshore Sensor 10 (NS10): Hawaii: Maunalua Bay		meta	background	RSS		University of Hawaii	nss10_agg
		data	graph		HiOOS Nearshore Sensor 2 (NS02): Hawaii: Ala Wai		meta	background	RSS		University of Hawaii	nss02_agg
		data	graph		HiOOS Nearshore Sensor 3 (NS03): Hawaii: Hilton Pier		meta	background	RSS		University of Hawaii	nss03_agg
		data	graph		HiOOS Nearshore Sensor 4 (NS04): Hawaii: Waikiki Aquarium		meta	background	RSS		University of Hawaii	nss04_agg
		data	graph		HiOOS Water Quality Buoy: Ala Wai		meta	background	RSS		University of Hawaii	wqbaw_agg
		data	graph		HiOOS Water Quality Buoy: Kilo Nalu		meta	background	RSS		University of Hawaii	wqbkn_agg
data			graph	M	NOAA Global Coral Bleaching Monitoring Products		meta	background	RSS		NOAA Coral Reef ...	NOAA_DHW
data			graph	M	NOAA WaveWatch III (NWW3) Global Wave Model		meta	background	RSS		University of Hawaii	NWW3_Global_Best
data			graph	M	NOAA WaveWatch III (NWW3) Hawaii Regional Wave Model		meta	background	RSS		University of Hawaii	NWW3_Hawaii_Best
data			graph	M	NOAA/NCEP Global Forecast System (GFS) Atmospheric Model		meta	background	RSS		NOAA NCEP	NCEP_Global_Best
		data	graph		PacIOOS Nearshore Sensor 5 (NS05): American Samoa: Pago Pago		meta	background	RSS		University of Hawaii	nss05_agg
		data	graph		PacIOOS Nearshore Sensor 6 (NS06): Federated States of Micronesia: Pohnpei		meta	background	RSS		University of Hawaii	nss06_agg
		data	graph		PacIOOS Nearshore Sensor 7 (NS07): Marshall Islands: Majuro		meta	background	RSS		University of Hawaii	nss07_agg
		data	graph		PacIOOS Nearshore Sensor 8 (NS08): Palau: Koror		meta	background	RSS		University of Hawaii	nss08_agg
		data	graph		PacIOOS Nearshore Sensor 9 (NS09): Guam: Cetti Bay		meta	background	RSS		University of Hawaii	nss09_agg
data			graph	M	Simulating WAves Nearshore (SWAN) Regional Wave Model: Big Island		meta	background	RSS		University of Hawaii	SWAN_Big_Island_Best
data			graph	M	Simulating WAves Nearshore (SWAN) Regional Wave Model: Kauai		meta	background	RSS		University of Hawaii	SWAN_Kauai_Best
data			graph	M	Simulating WAves Nearshore (SWAN) Regional Wave Model: Maui		meta	background	RSS		University of Hawaii	SWAN_Maui_Best
data			graph	M	Simulating WAves Nearshore (SWAN) Regional Wave Model: Oahu		meta	background	RSS		University of Hawaii	SWAN_Oahu_Best
data			graph	M	SST, Blended, Global, EXPERIMENTAL (5 Day Composite)		meta	background	RSS		NOAA CoastWatch ...	erdBAssta5day
		data	graph		TAO Array Data from the PMEL DAPPER Server		meta	background	RSS		NOAA PMEL	pmelTao
data			graph		Tide Model for the Big Island of Hawaii: Tidal Elevation		meta	background	RSS		University of Hawaii	tide_bi_elev
data			graph	M	Tide Model for the Big Island of Hawaii: Tidal Velocity		meta	background	RSS		University of Hawaii	tide_bi
data			graph		Tide Model for the Hawaiian Islands: Main NW Islands: Tidal Elevation		meta	background	RSS		University of Hawaii	tide_mhi_elev
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data			graph		Tide Model for the Pacific Ocean (Barotropic): Tidal Elevation		meta	background	RSS		Oregon State Un ...	tide_pac_elev
data			graph	M	Tide Model for the Pacific Ocean (Barotropic): Tidal Velocity		meta	background	RSS		Oregon State Un ...	tide_pac
data			graph	M	Topography, ETOPO1, 0.0166667 degrees, Global (longitude -180 to 180), (Ice Sheet Surface)		meta	background	RSS		NOAA NGDC	etopo180
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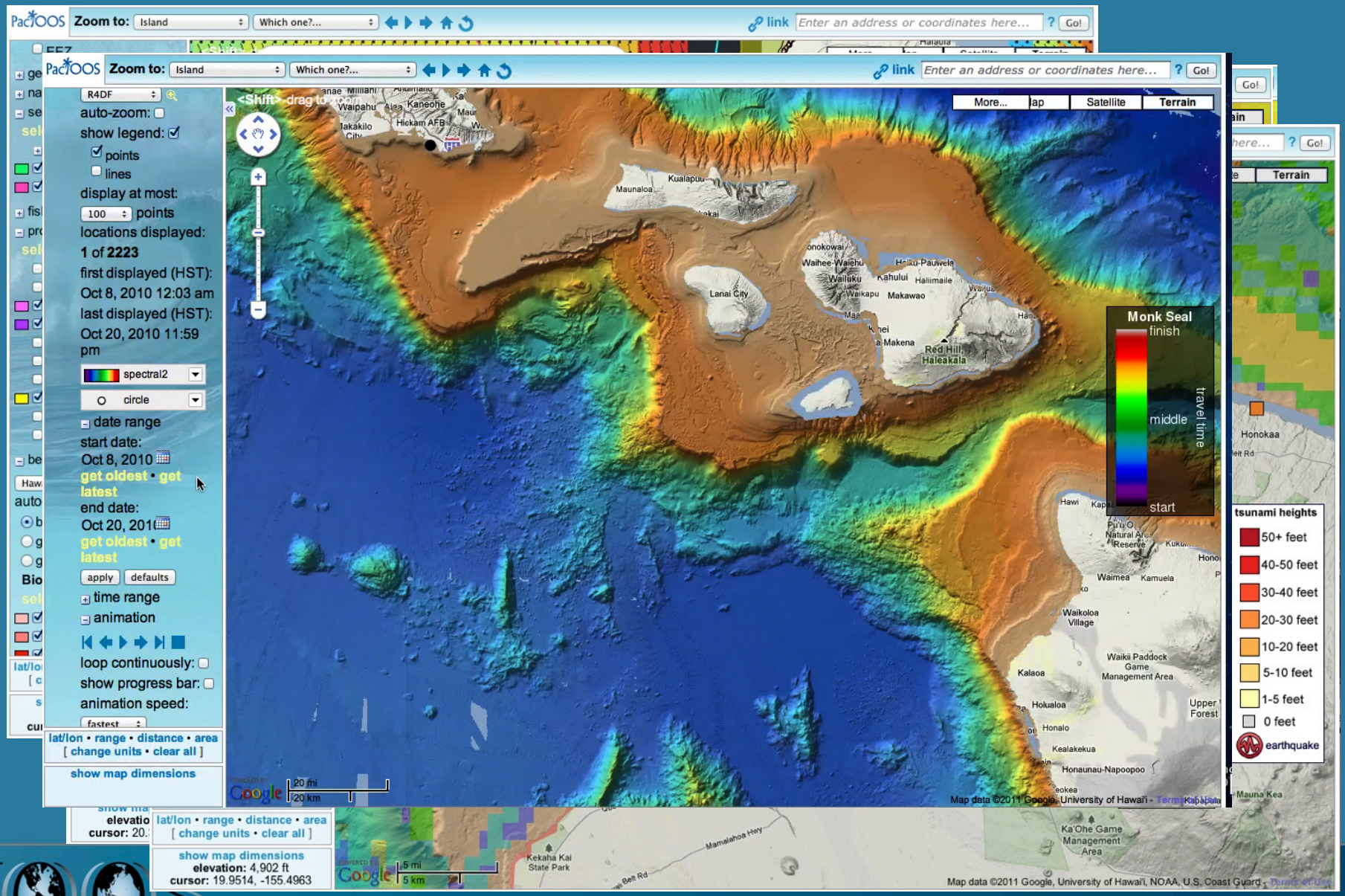
data			graph	M	U.S. Navy Coastal Ocean Model (NCOM): Hawaii: 3-D Variables		meta	background	RSS		Naval Research ...	NCOM_Hawaii_Best
data			graph	M	U.S. Navy Coastal Ocean Model (NCOM): Hawaii: Sea Surface Height		meta	background	RSS		Naval Research ...	NCOM_Hawaii_SSH_Best

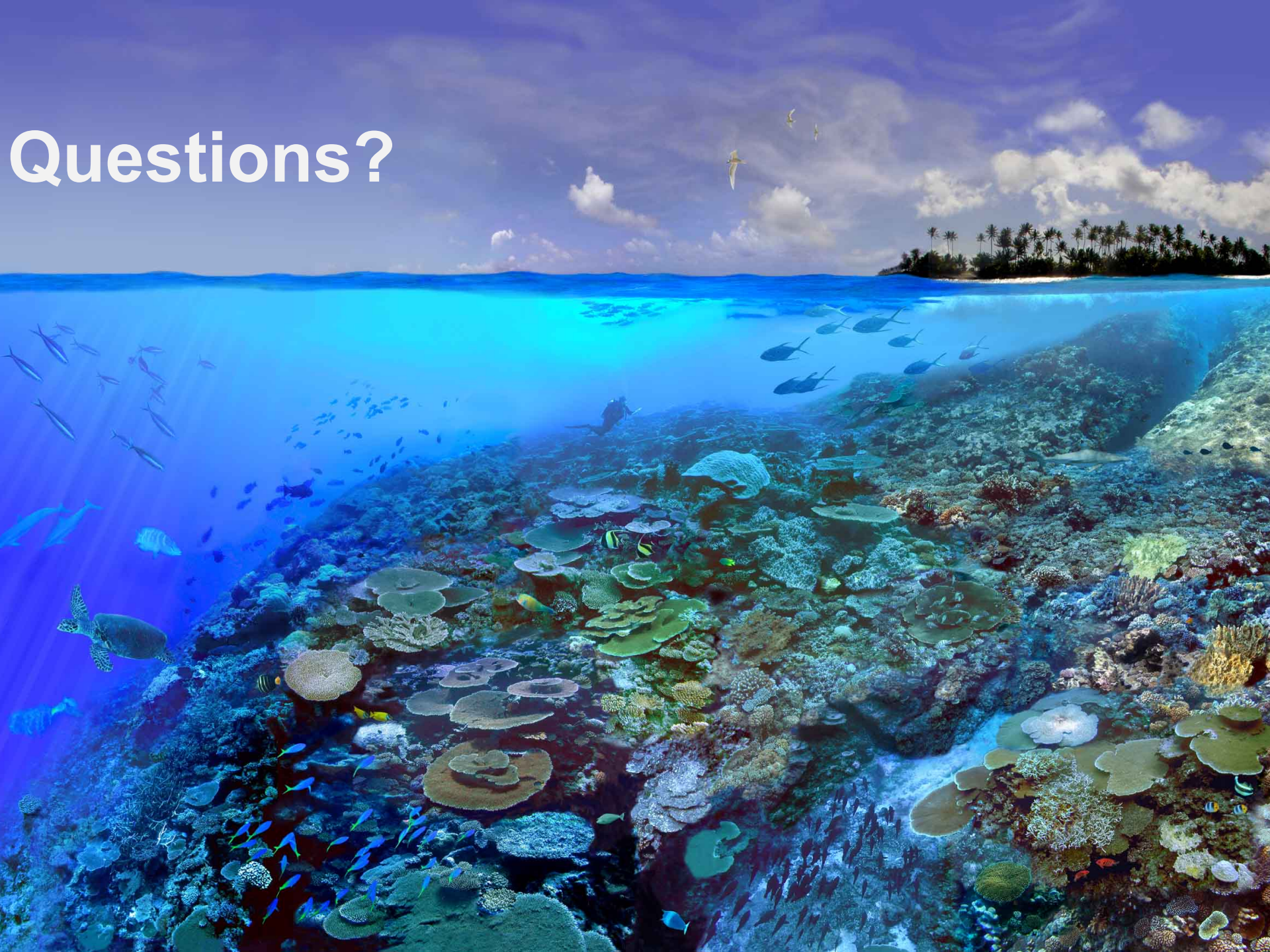
34 dataset(s)

IOOS®

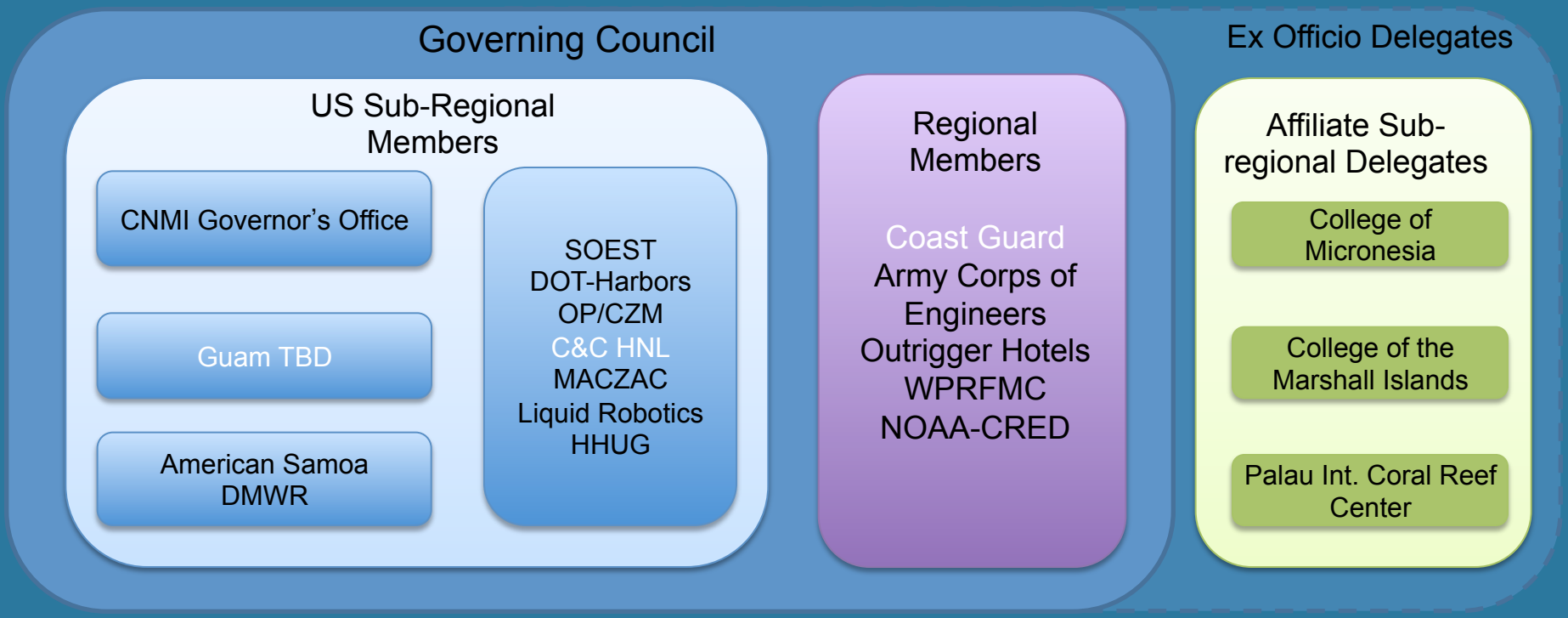
PacIOOS MapViewer



Questions?



Governing Council



Program Details: Personnel and Fiscal

- Personnel
  - ~40 full or part-time faculty, technicians, students
  - 6 tenure track SOEST faculty

- Program Support
  - $8,182,000 from NOAA IOOS C.A.
    - $1,196,000 RA
    - $6,986,000 RCOOS
  - $650,000 annually from HI, faculty salaries
  - $1,196,000 from State, County, and SOEST
  - Pending:
    - Proposed $20,000,000 from NOAA IOOS C.A

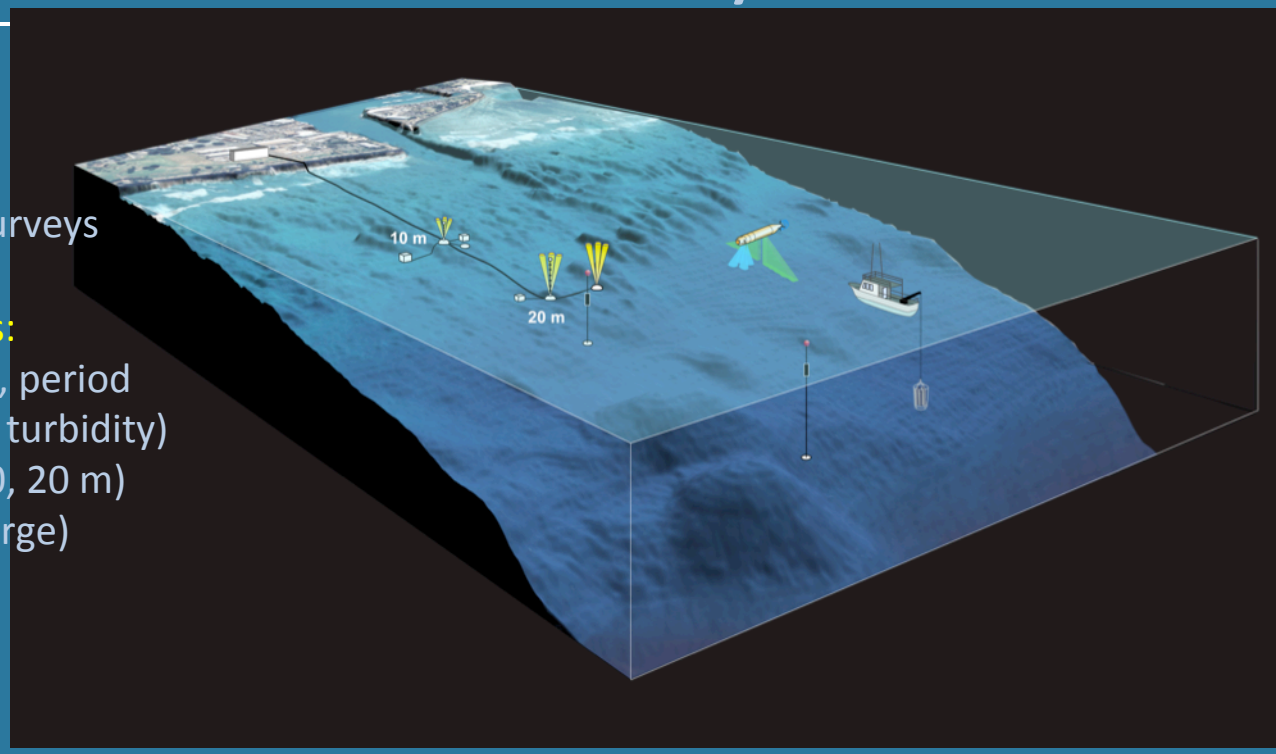
Ocean State: Kilo Nalu Observatory

Observational array:

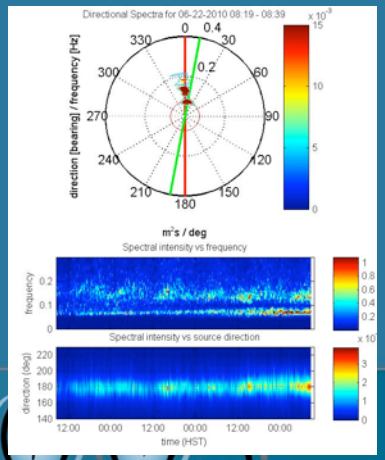
- Nodes at 10, 20 m
- Moored profilers (30 m, 65 m)
- Spatial sampling: REMUS AUV surveys

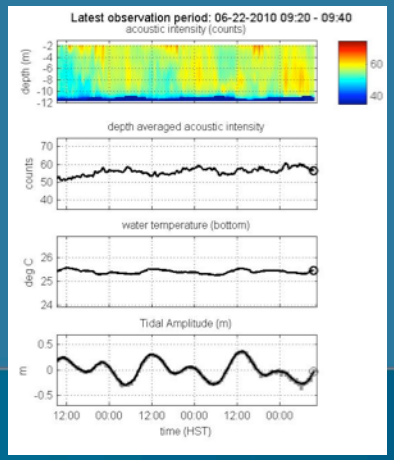
Real-time/archived data, products:

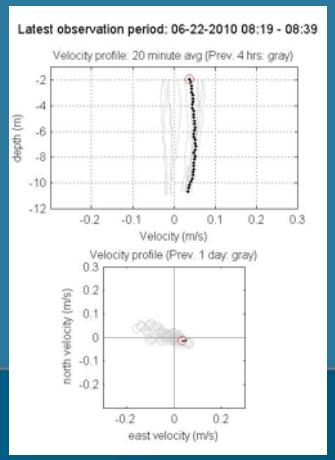
Wave height, direction, period
Water properties (T, S, turbidity)
Nearshore currents (10, 20 m)
Near-bed velocities (surge)
24-hr particle tracks

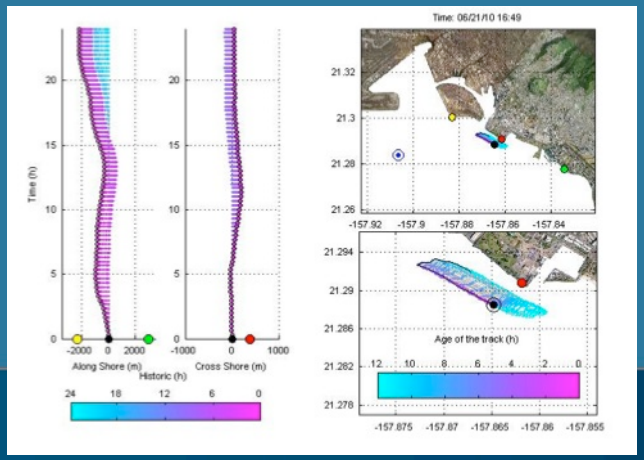


→ Input/validation for local wave, current, water level modeling

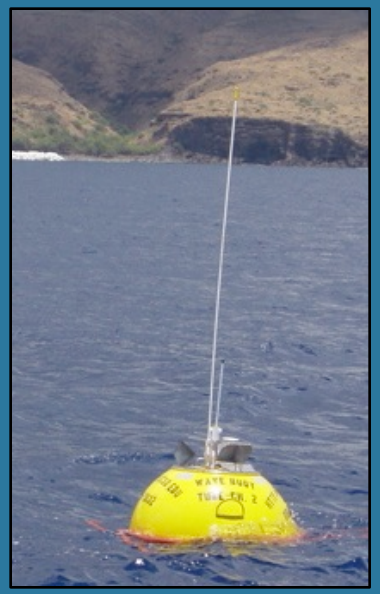








Ocean State: Wave Buoys



Observational array:

- Waverider buoys off Lanai, Waimea Bay, Kailua, Barbers Point, Guam, Majuro, and soon to be Hilo and Kahului.
- Buoys possible through partnerships with USACE and CDIP (Scripps)

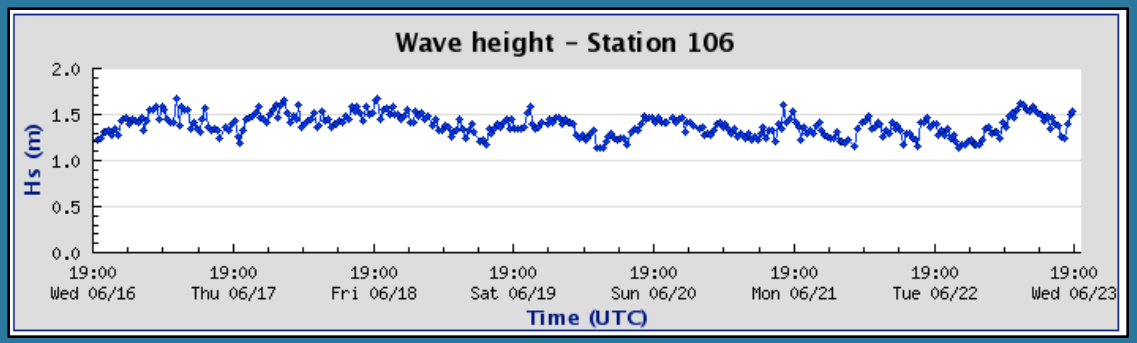
Real-time/archived data:

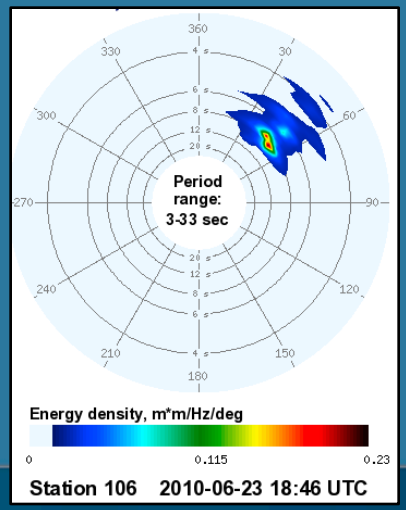
Wave height, direction, period

Conditions surround harbor entrances

→Input/validation for local wave, current, water level modeling

→Input to prediction of high-water level events (flooding, inundation)





Ocean State: Harbor Measurements

Observational array:

- Water level station in Kalaeloa Harbor and Kaumalapau
- Current meter in Kalaeloa Harbor Channel
- Waverider offshore Barbers Point and Kaumalapau

Real-time/archived data:

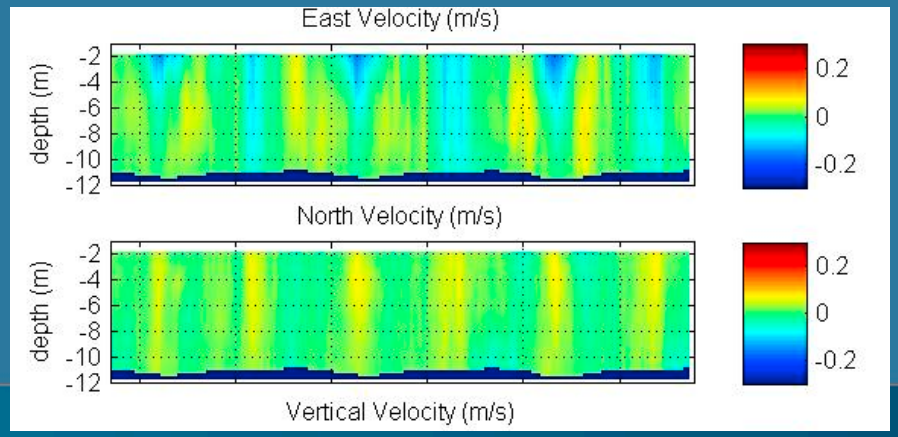
Offshore wave height, direction, period

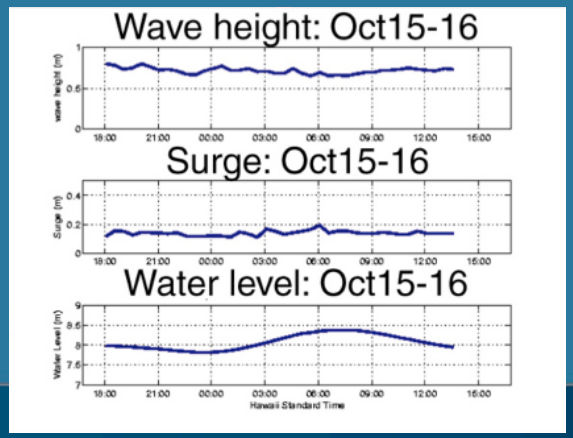
Conditions within and near harbor (currents, swell, surge)

→Input/validation for local wave, current, water level modeling

→Input for prediction of high-water level events (flooding, inundation)

→Real-time reporting of harbor conditions at Kaumalapau and Barbers Point (under development)





Ocean State: Gliders and Moored Profilers

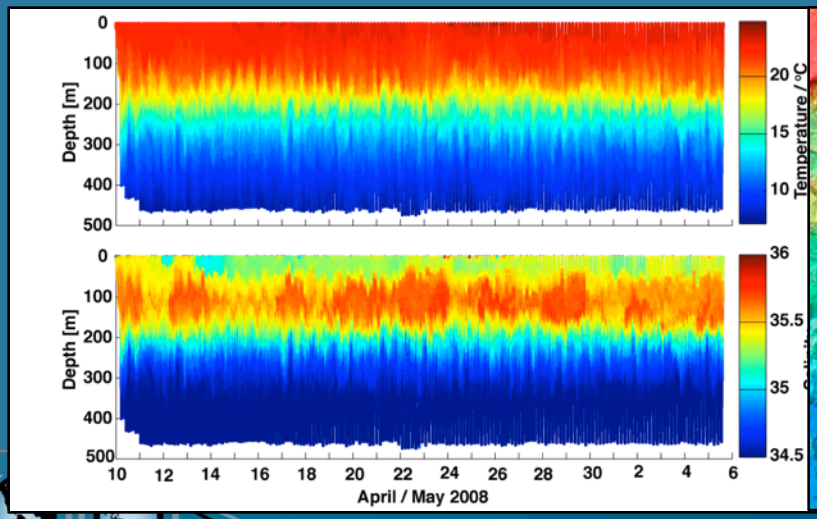
Observational array:

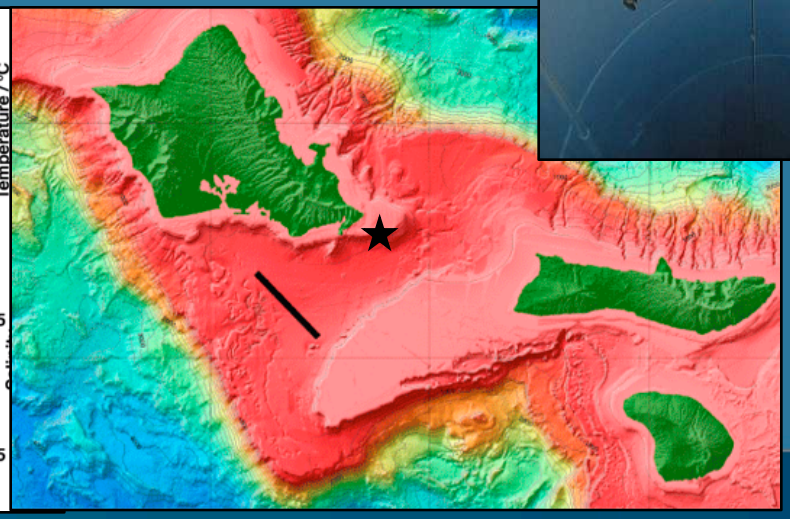
- 2 McLane moored profiling arrays (1 pre-deployment prep, 1 pre-deployment planning)
- 1 iRobot SeaGlider (250 days of data collection thus far)

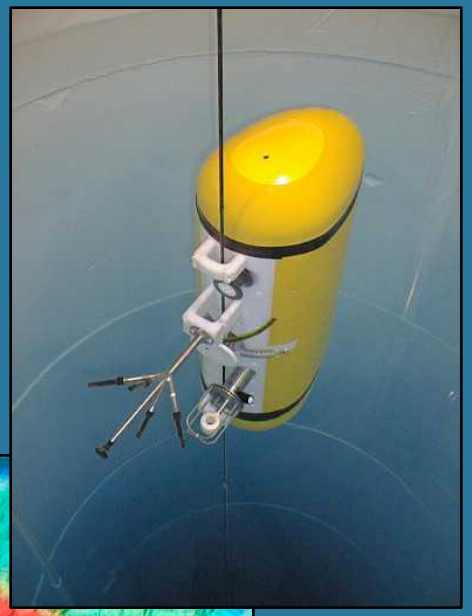
Real-time/archived data:

Profiler	Currents, CTD, turbidity with profiler Currents, CTD at subsurface mooring CTD at mooring anchor
Glider	CTD, DO, chlorophyll, location along multiple lines around Oahu

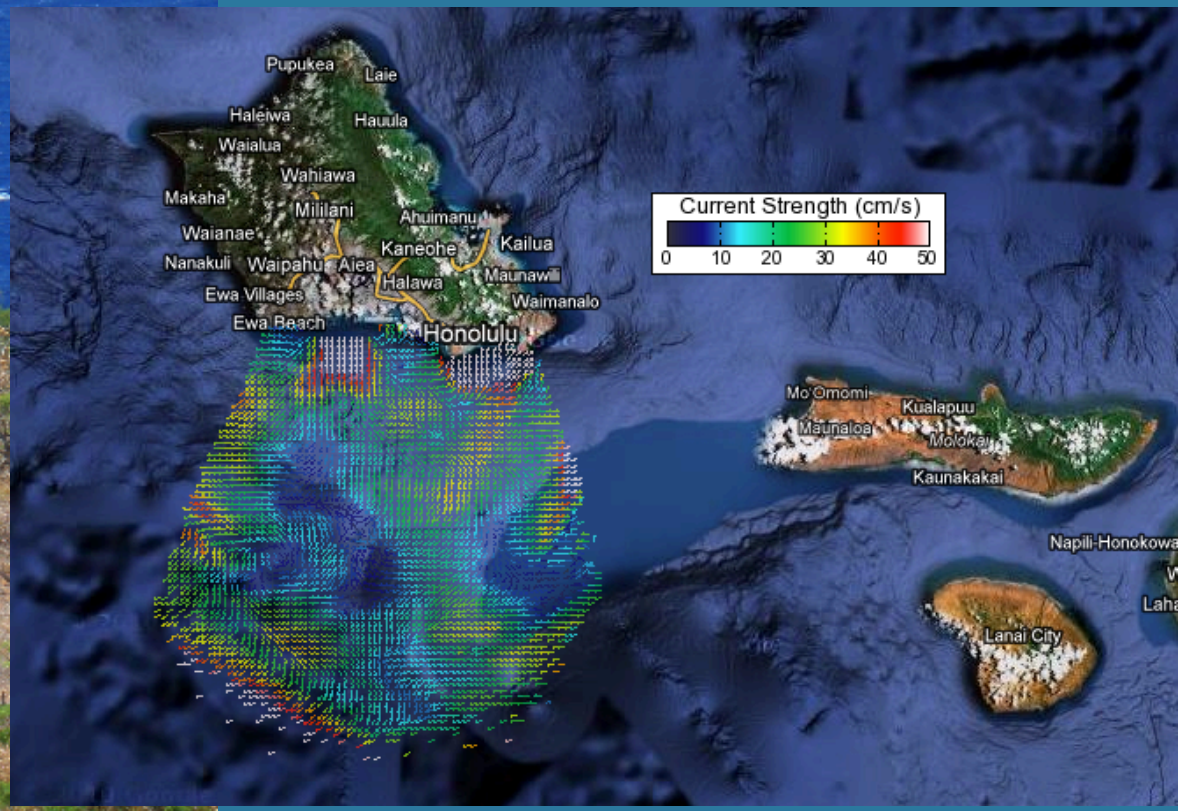
→Input/validation for numerical models



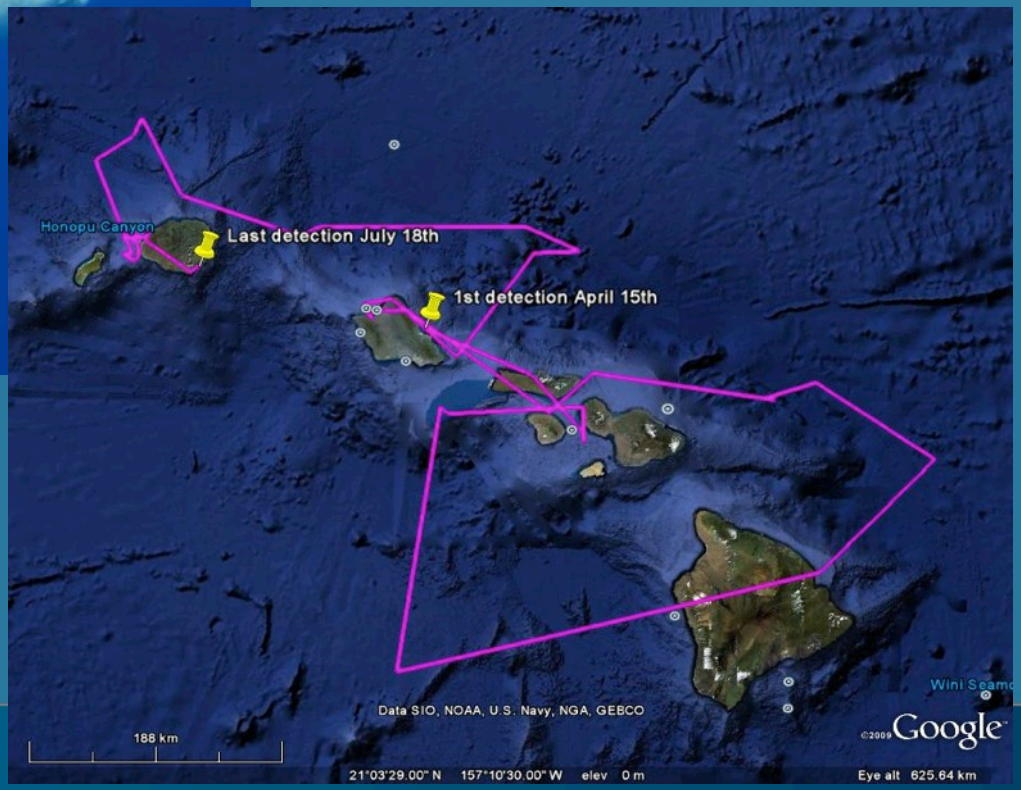




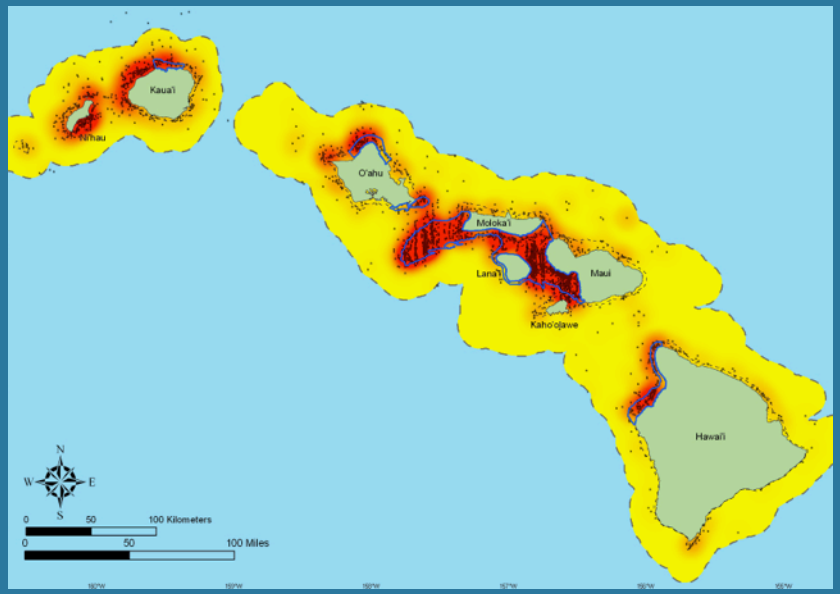
Ocean State: High Frequency Radio

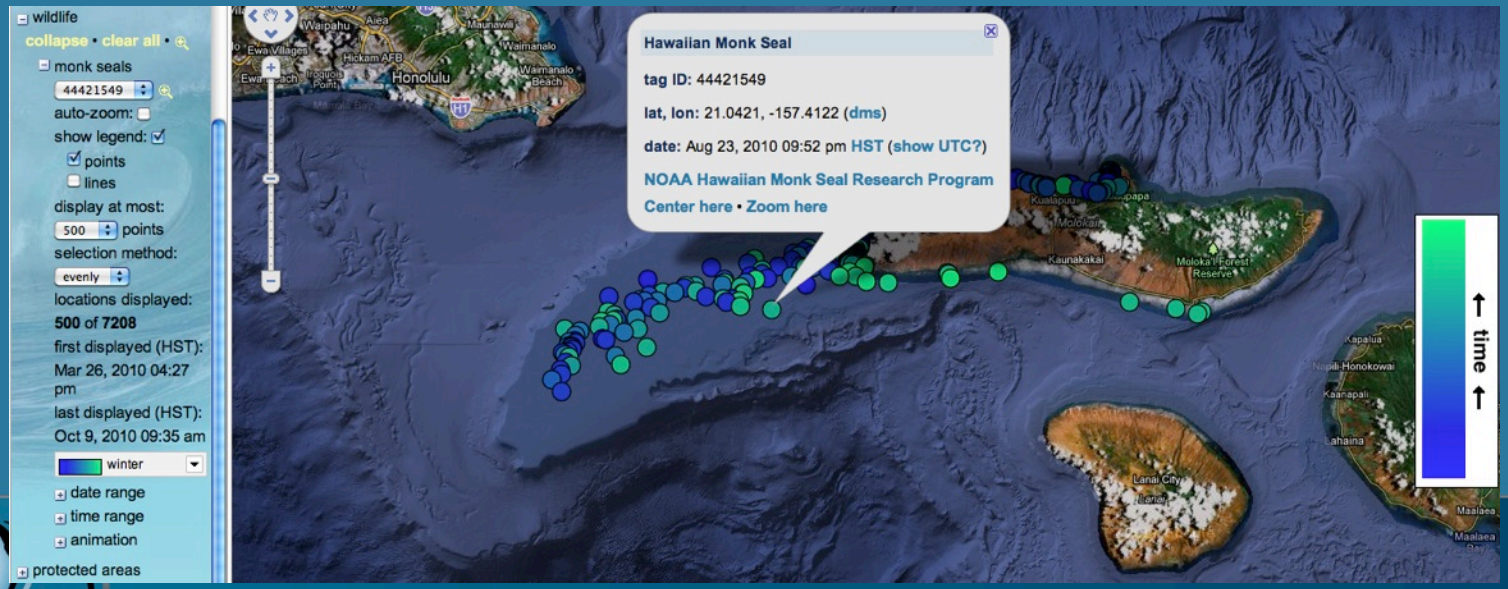


Ecosystems: Tagging and Tracking



Ecosystem Information



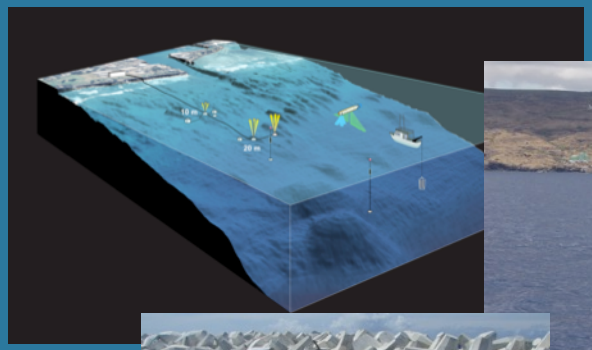


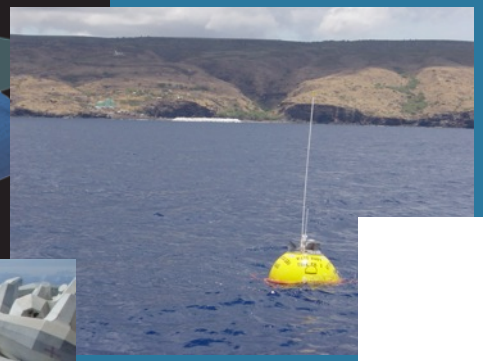
Coastal Hazards: Inundation and Flooding

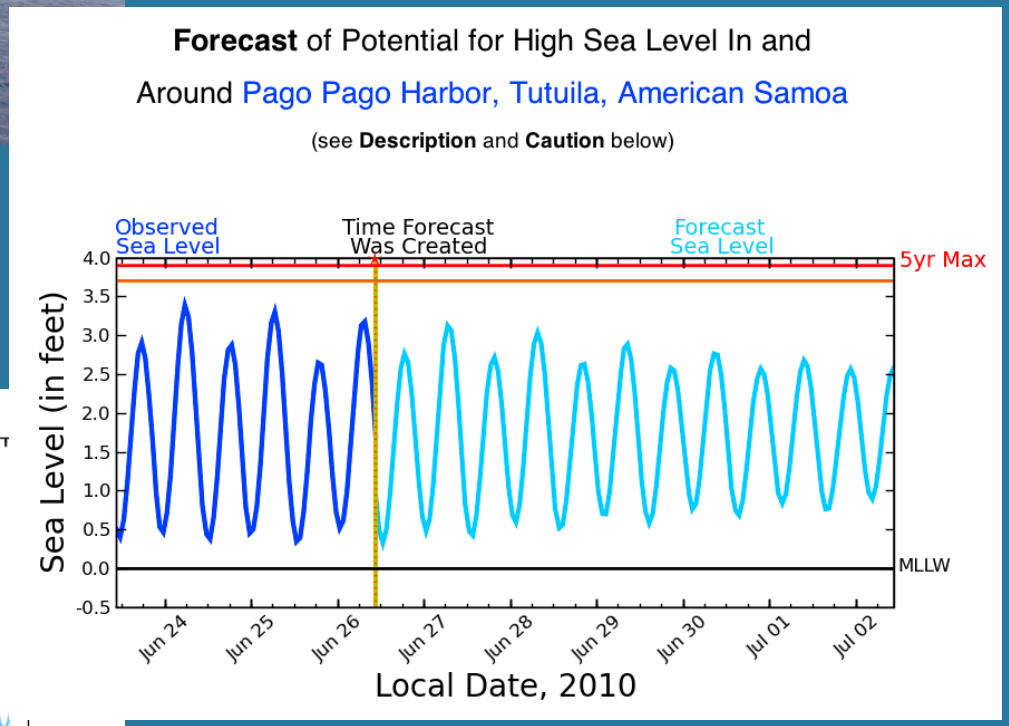
high tide + high sea level = slow, low-land flooding (property damage & business disruption)

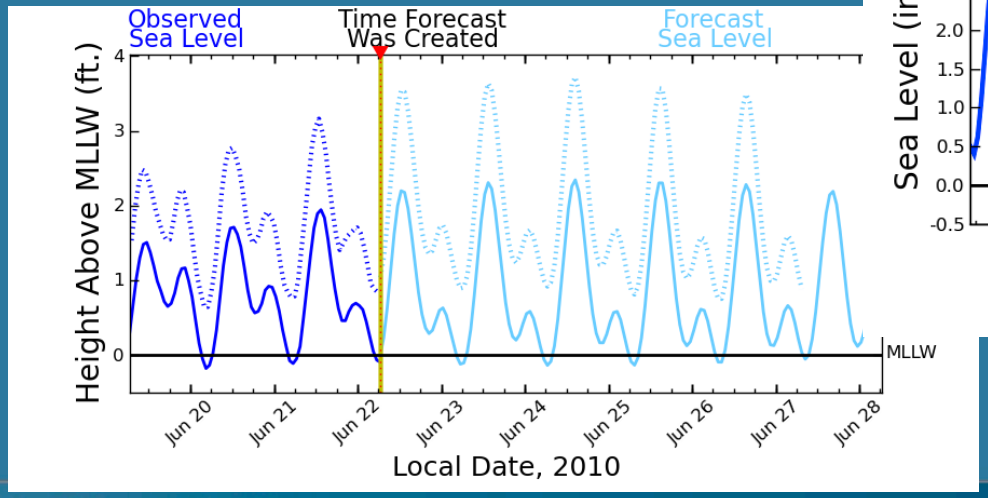
high Tide + high winter surf = coastline inundation (property damage & road overtopping)

Coastal Hazards: Prediction

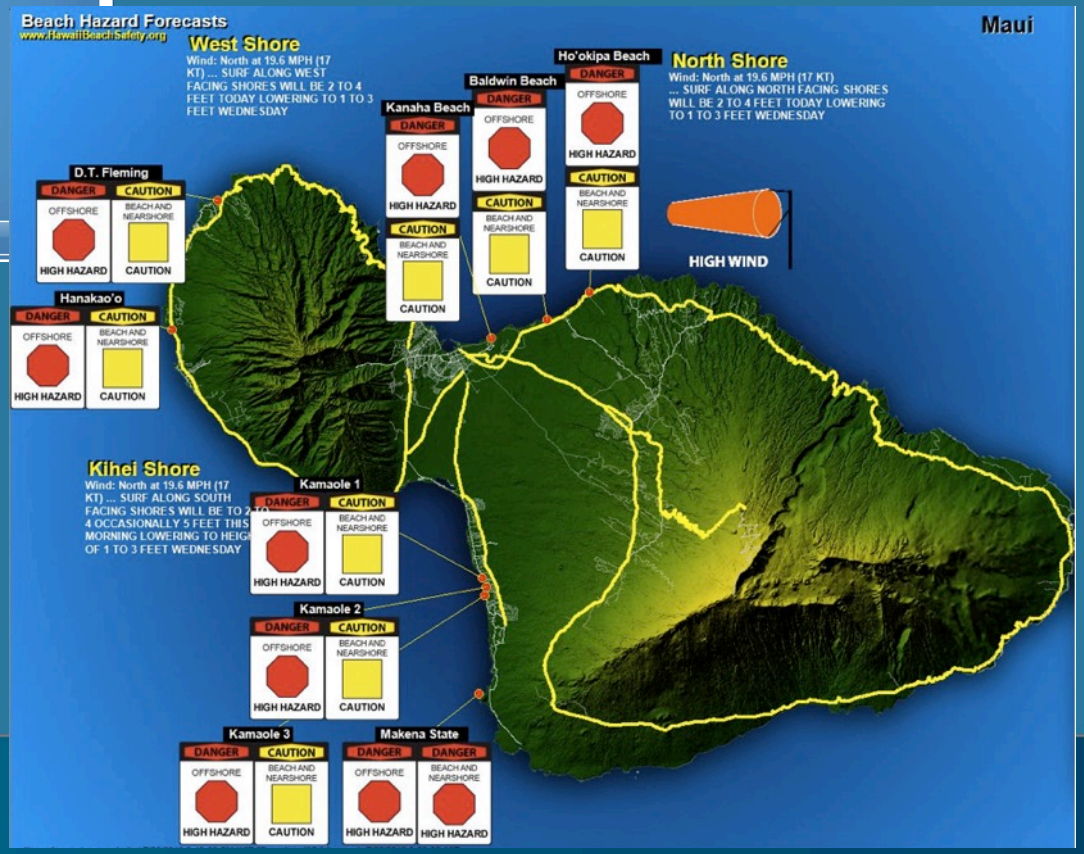








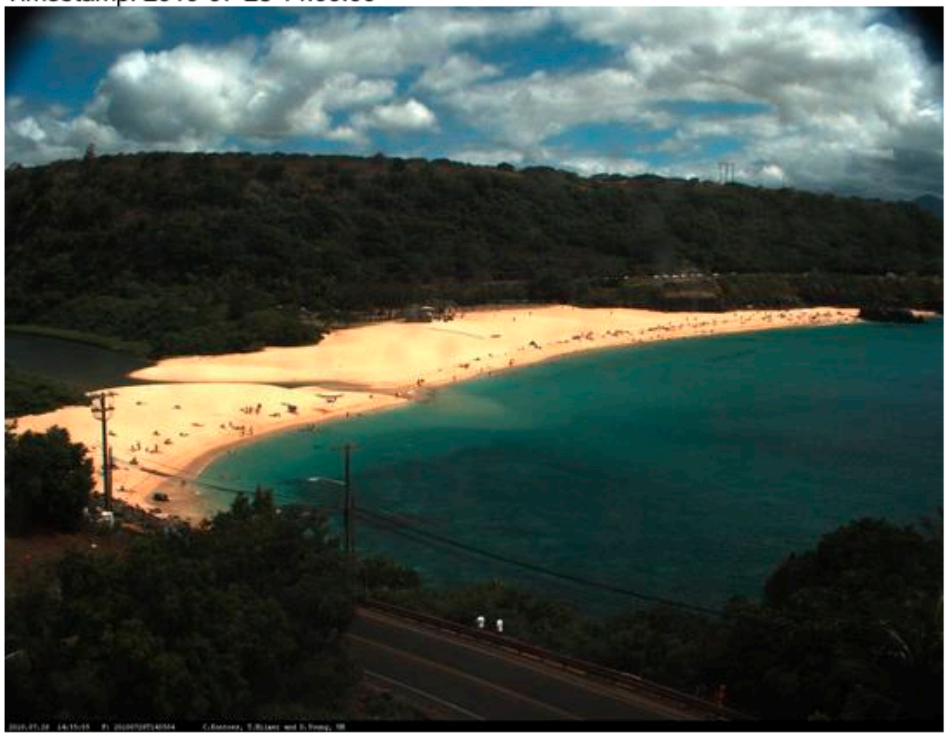
Coastal Hazards: Beach Safety



Coastal Hazards: Beach Cameras

Waimea

Timestamp: 2010-07-28 14:00:00



Waikiki

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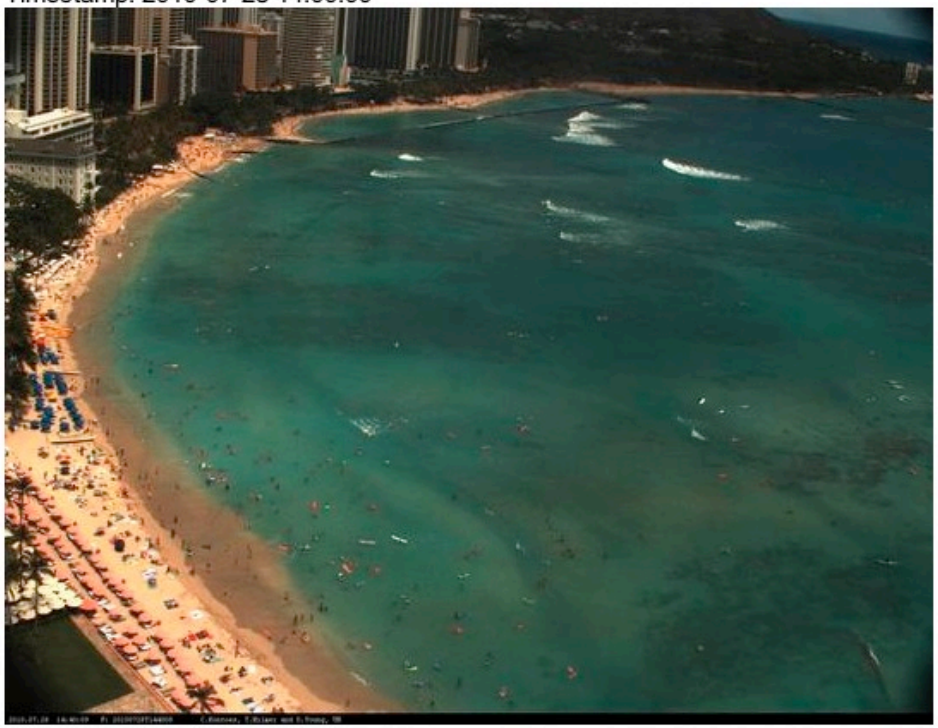


Coastal Hazards: Tripod LiDAR

Laser: 1500 nanometer, class 1 (eyesafe)

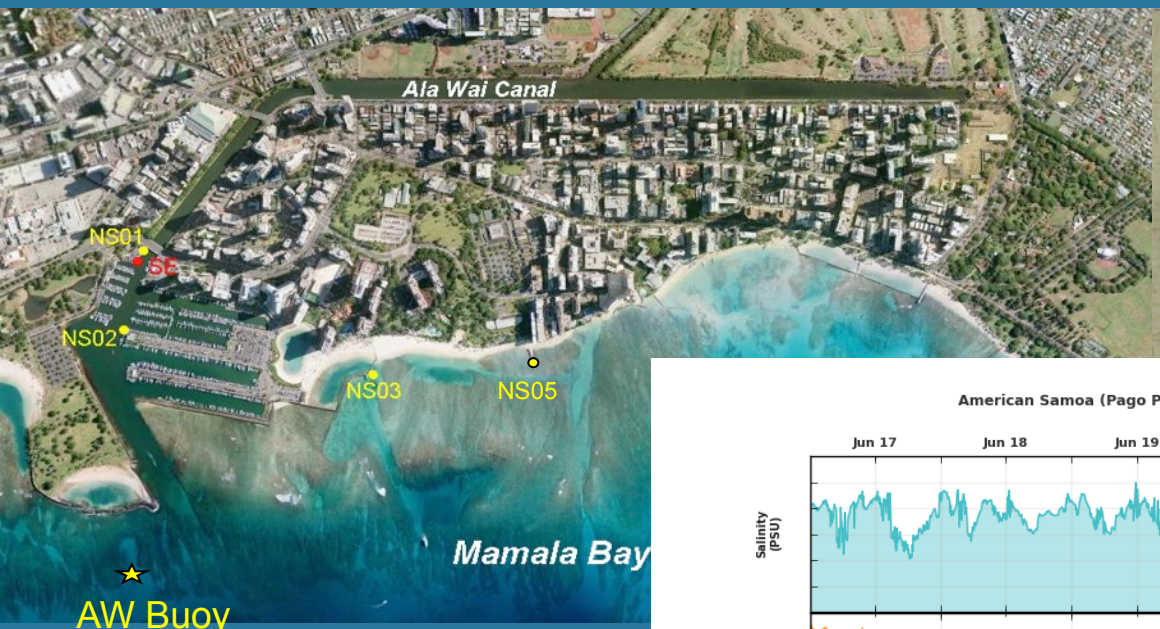
Sampling rate: 2500 points per second

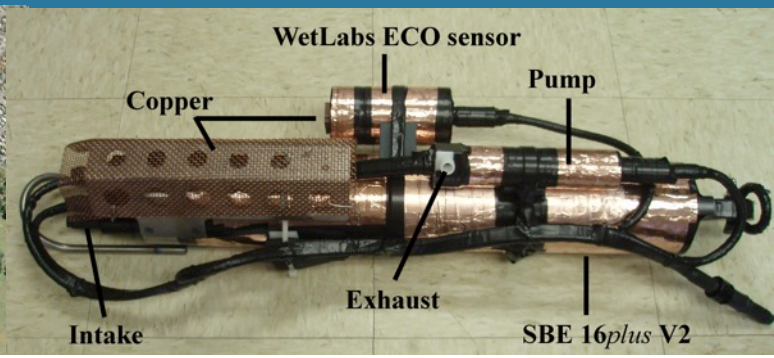
Raw range accuracy: 7mm @100m

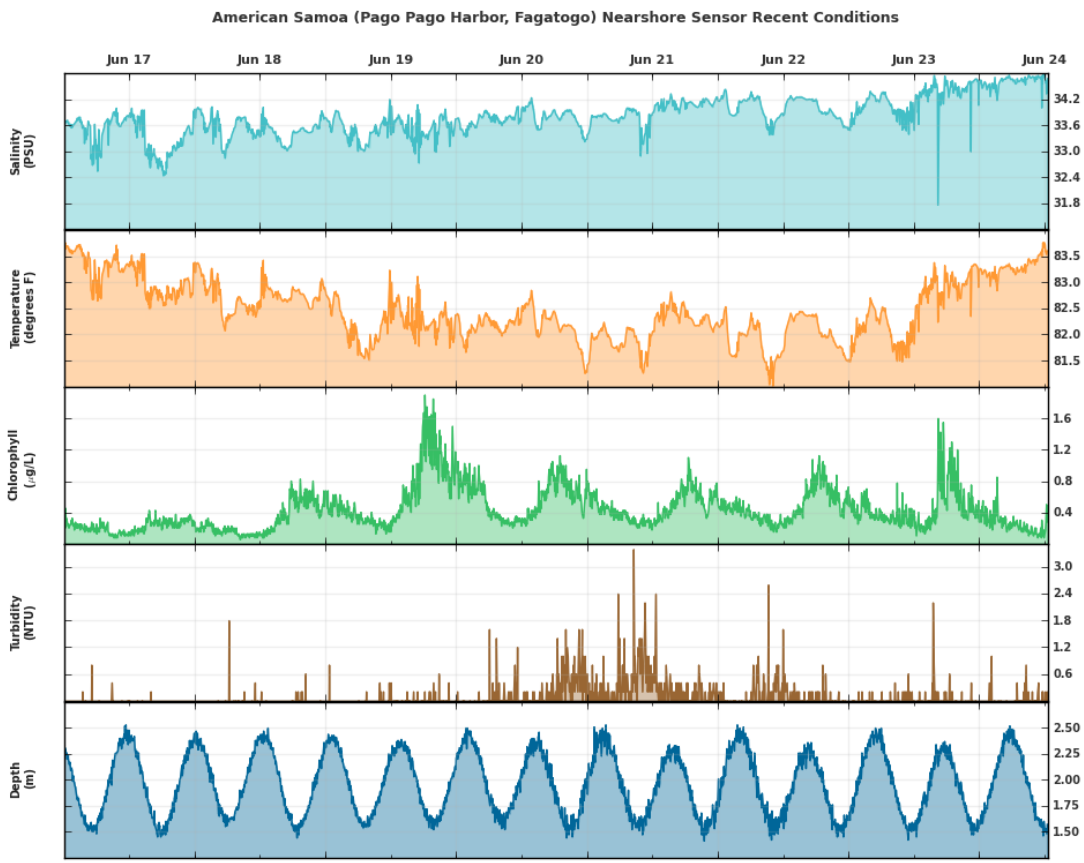
2 intensity channels → 16 bit intensity data

→ RAPID, PRECISE TOPOGRAPHIC SURVEYS

Water Quality: Sensing





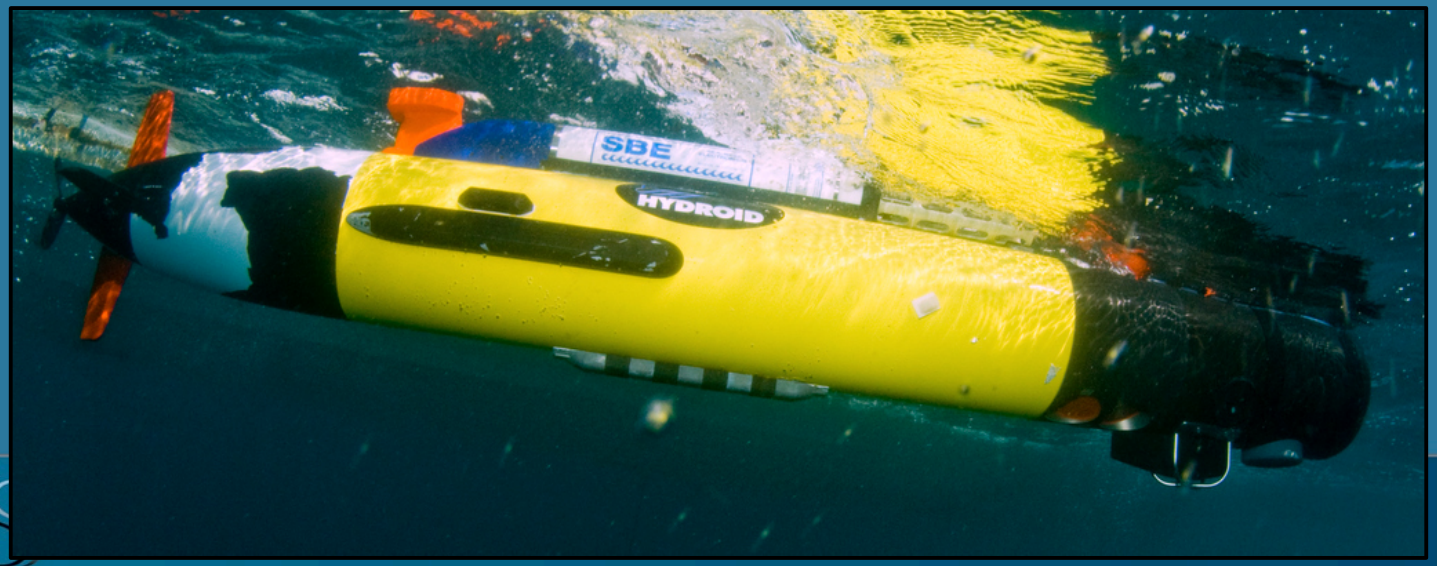


REMUS Autonomous Underwater Vehicle

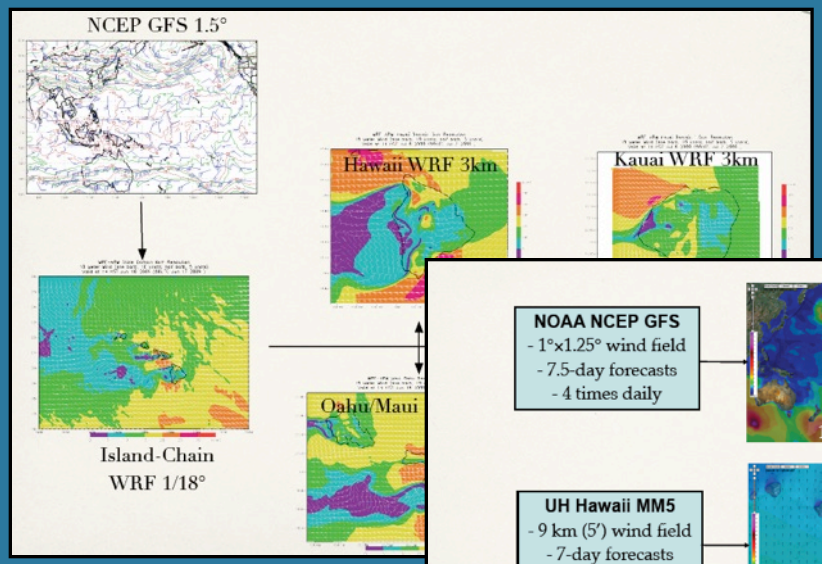
Max operating depth: 100m
Speed: 2-5 kts
Duration (range):
8 hours @ 5 kts (70 km)
20 hours @3 kts (>100 km)

Instrumentation:

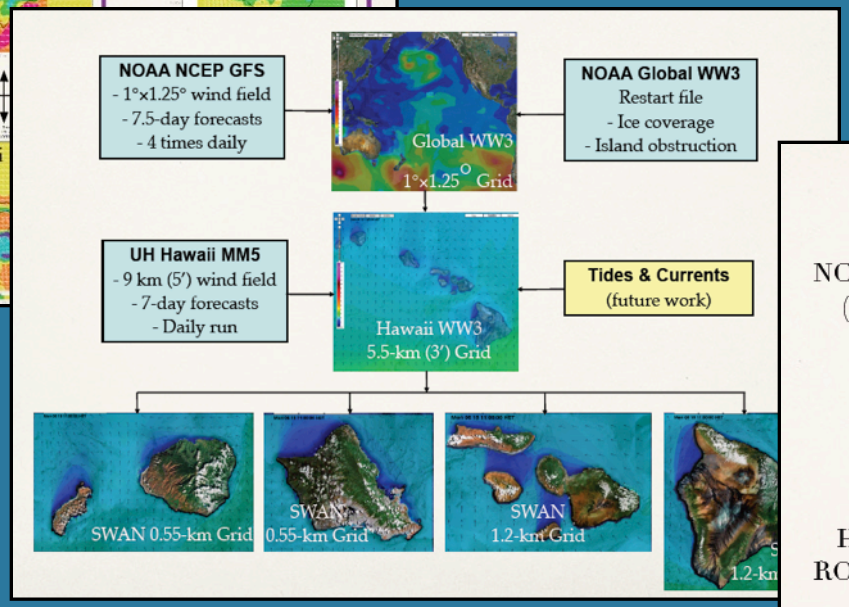
CTD: Conductivity (salinity), temperature, pressure (depth)
ADCP/DVL: flow velocity, acoustic backscatter, bathymetry
BB2f: fluorescence (Chl), 2 freq. optical backscatter,
900 Mhz Sidescan Sonar: bed morphology, substrate, sediment accretion
Video Camera: Bottom characteristics
Imagenex Altimeter: Bed roughness
Wetlabs CDOM: particulate organic matter



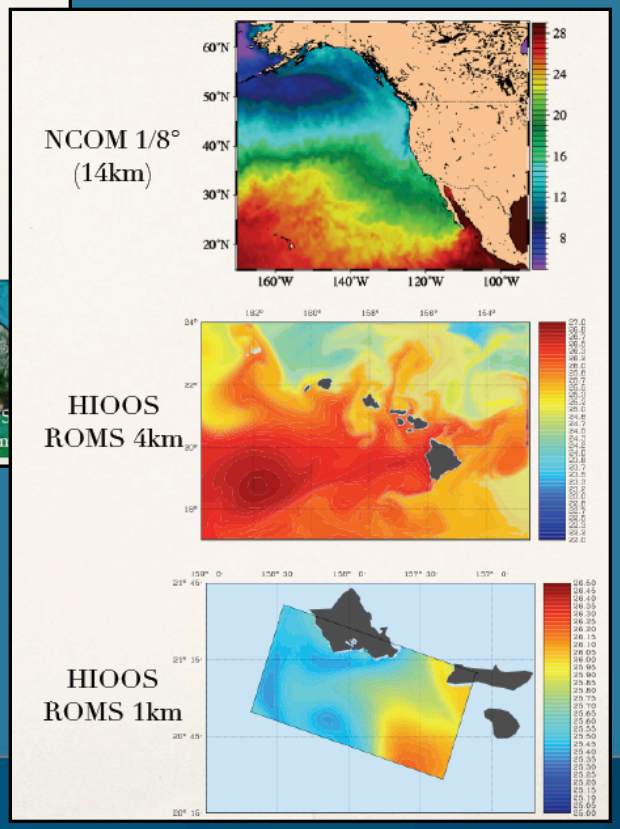
Physical Modeling



Wind



Ocean



Wave