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National Center for Island, Maritime, and Extreme Environment Security (CIMES)

UNIVERSITY of HAWAI'I MĀNOA

uprm.edu
universidad de puerto rico
Recinto Universitario de Mayagüez

UAF UNIVERSITY OF ALASKA FAIRBANKS

Research and Lead Investigators

Coastal Radars Detection (NSF & NOAA)
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Sungkyun Lim, Hawaii Center for Advanced Communications, UH
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Harbor Acoustic Monitoring Systems (ONR)
John Allen, Mechanical Engineering, UH
Eva-Marie Nosal, Ocean Resources & Engineering, UH

Satellite Tracking (NASA, DoD)
Kevin Engle, Geographic Information Network of Alaska, UAF
Tom Heinrichs, Geographic Information Network of Alaska, UAF
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Zhengqing Yun Hawaii Center for Advanced Communications, UH

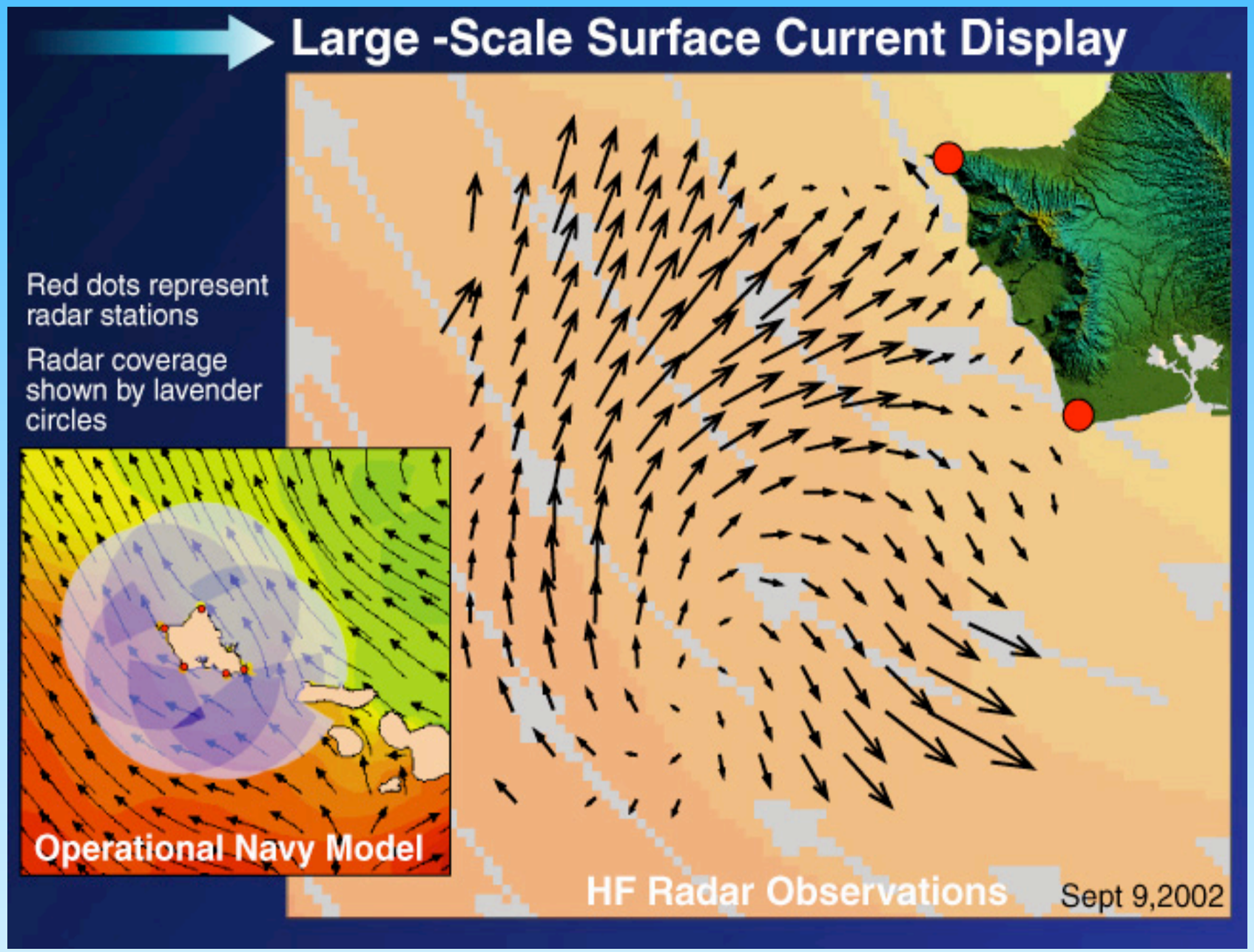
Decision Support Systems (NSF)
Kenneth Kaneshiro, Director, Center for Conservation Research and Training, UH
Kevin Montgomery, CEO, Intelesense

CIMES Local Advisory Board

Commander Coast Guard District 14
PACOM Homeland Security Assistant
Commander Hawaii National Guard
Area Maritime Security Committee (3)

Agency-driven Products

Coastal Radars for Coast Guard and PACOM



Applications and Stakeholders

1. Search-and-rescue (SAR) efforts: real-time maps of currents reduce uncertainty on drift from time of incident, narrow down search area and increase probability of rescue

2. Maritime security: detect and track ships and aircraft in real time up to 250 km from shore, 10 times further than X-band radars

3. Oil-spill response: nowcast surface currents to optimaly deploy containment and clean-up equipment where oil is likely to reach shore, and minimize impact on environment.

4. Pollution release and river runoff: fate of polluted plumes monitored in real time, public health warnings selectively issued for areas likely to be affected

5. Barge routing, large current warnings: nowcasting surface currents to detect situations when tides, wind-driven currents and eddies add constructively, and route vessels to benefit from more favorable counter-currents.

6. Warn for anomalously large currents to protect divers, kayakers, swimmers.

7. Fishing operations: real-time maps of surface currents save fuel and shorten trip durations by assisting fishermen in selecting fishing grounds likely to be most productive based on their experience

8. Near-shore sand transport: maps of surface currents improve understanding of alongshore current patterns and their seasonal variations, and assist in establishing erosion management strategies

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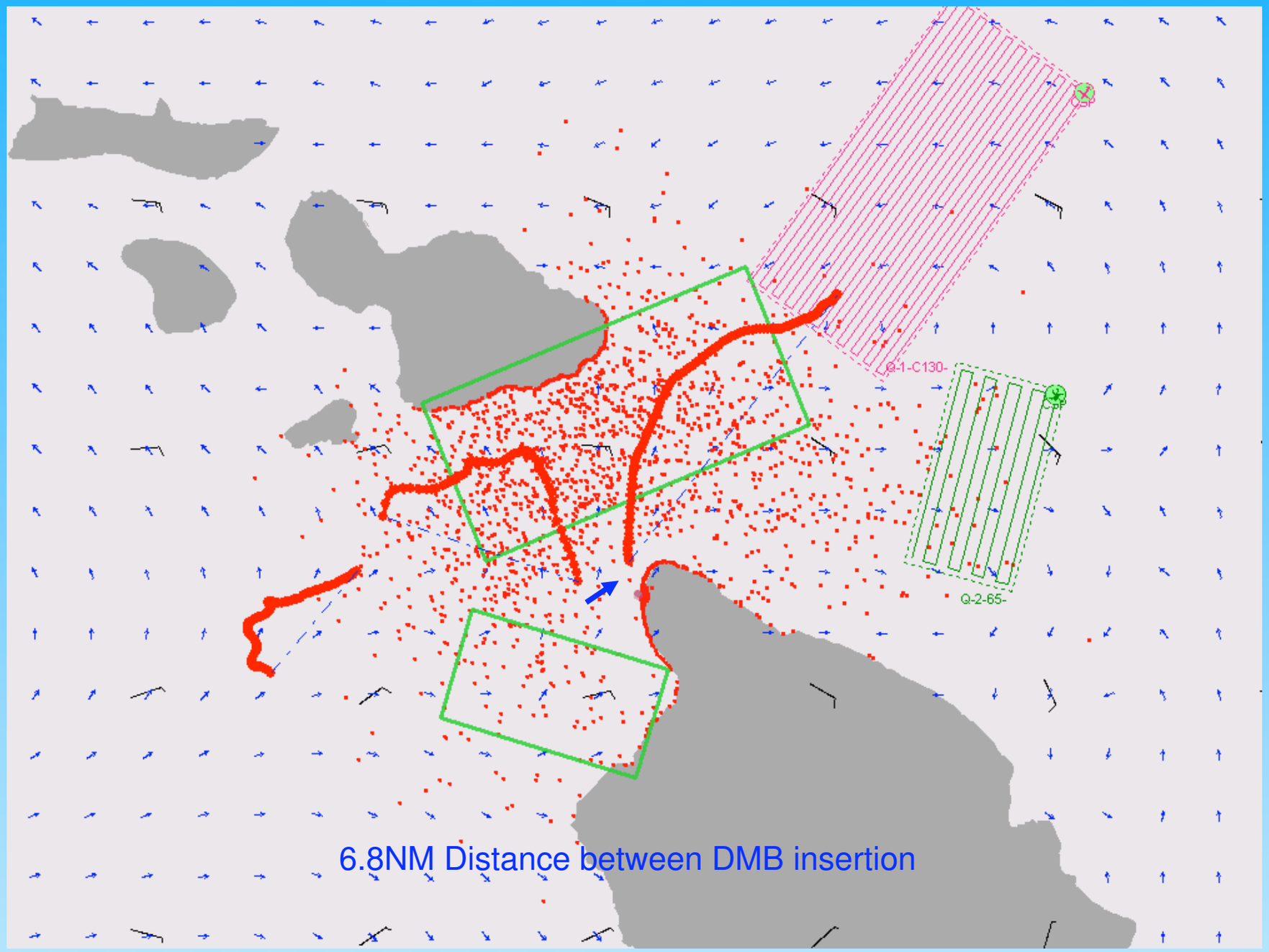

Data Marker Buoys
November, 2008

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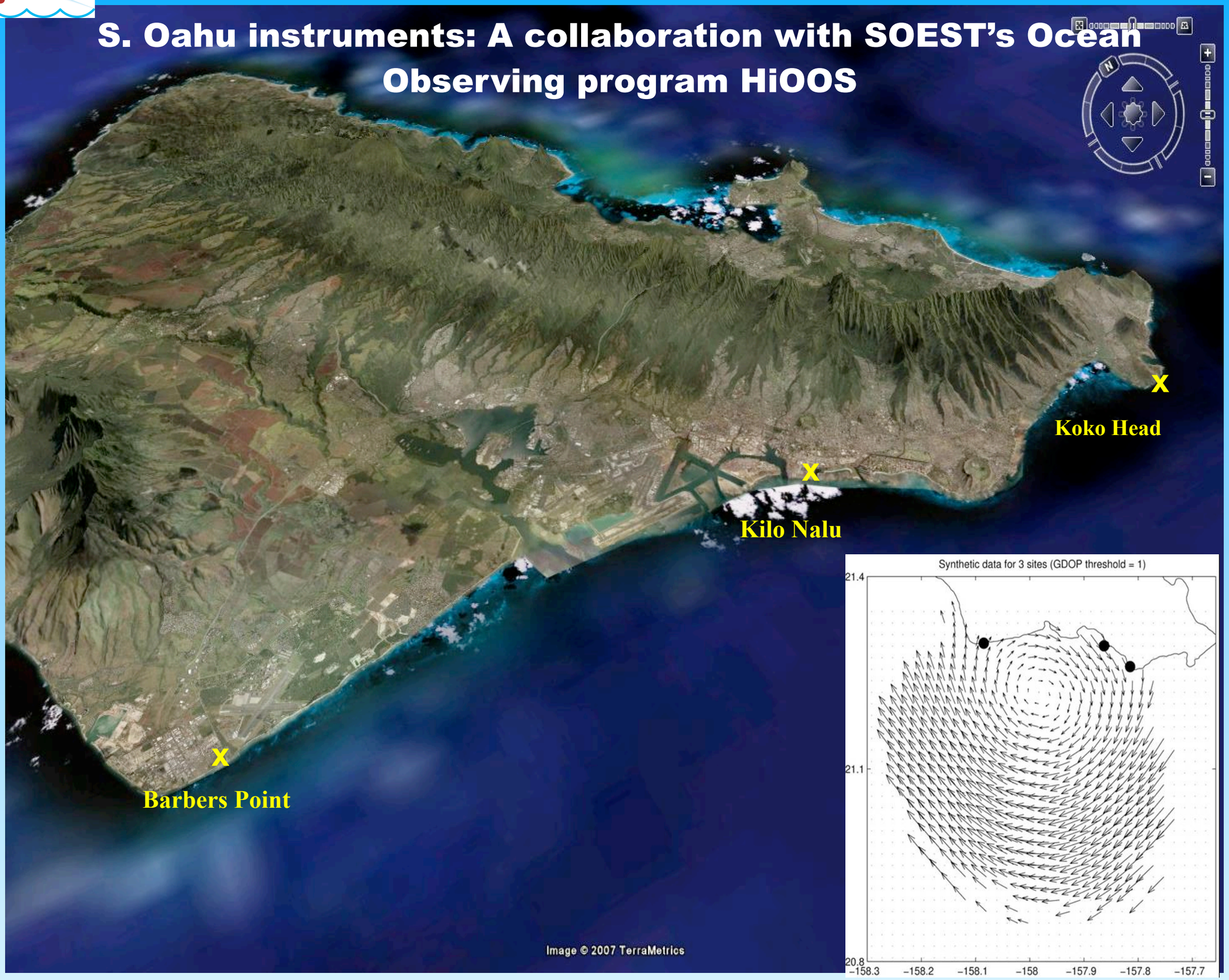
S. Oahu instruments: A collaboration with SOEST's Ocean Observing program HiOOS



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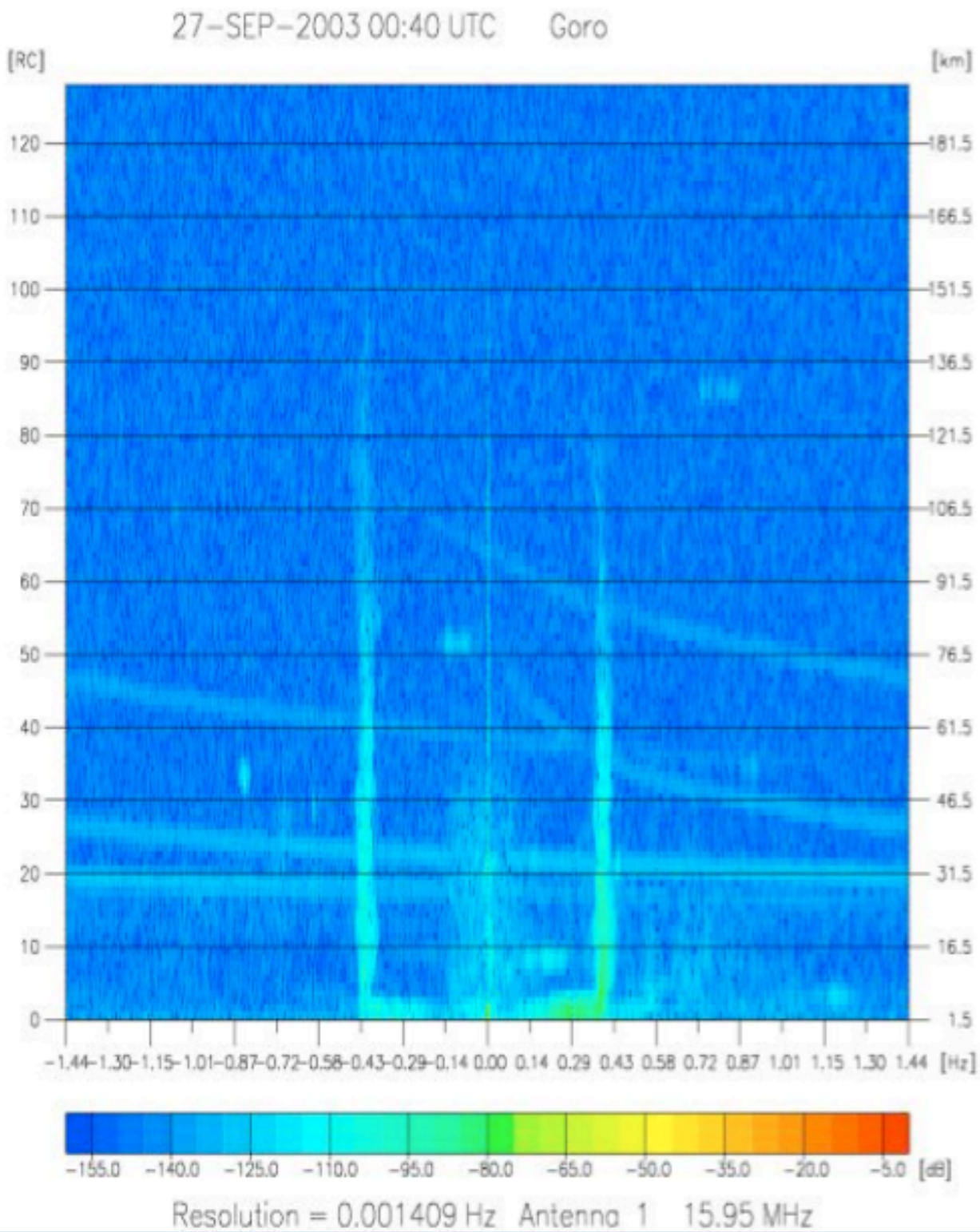
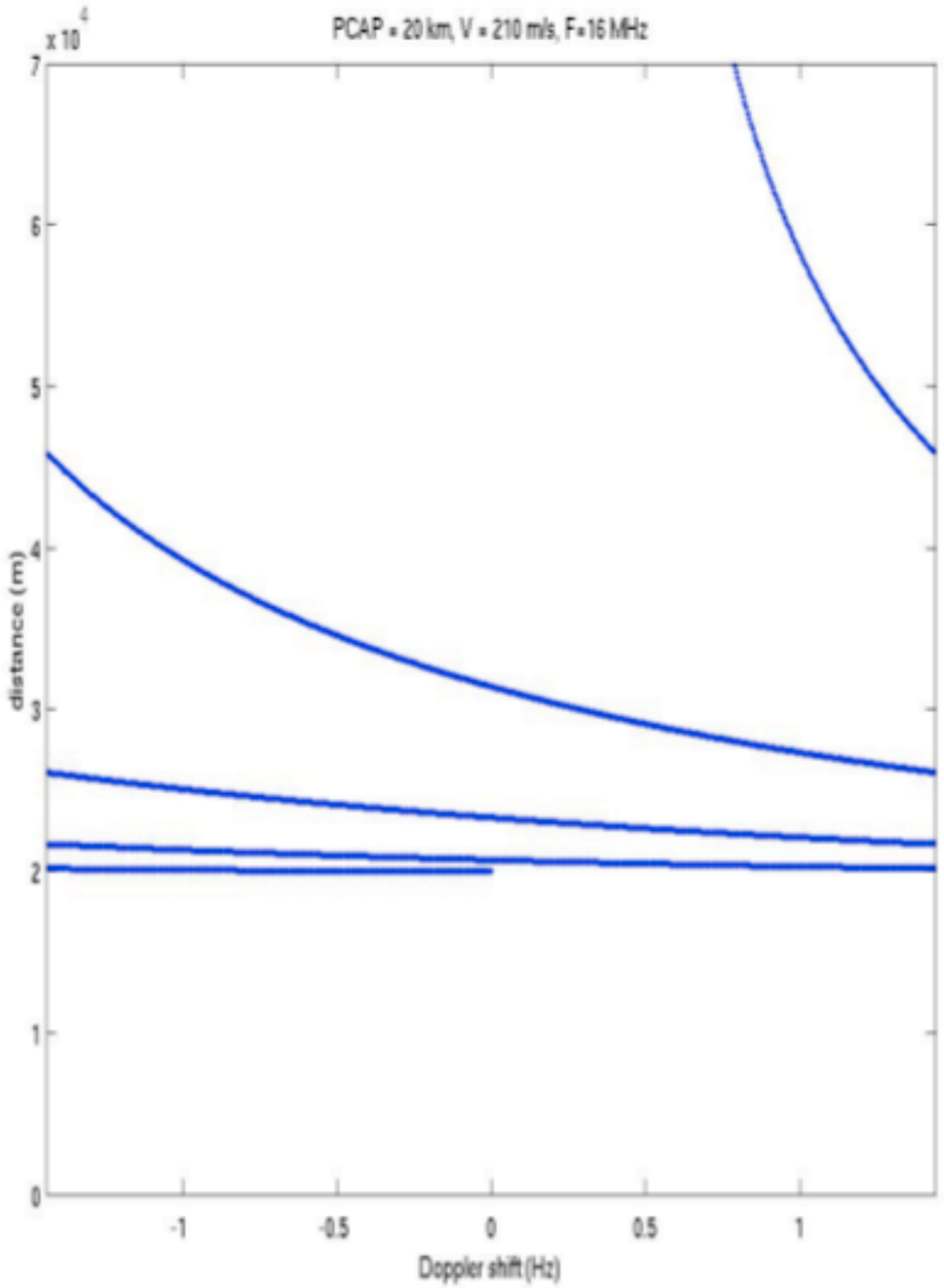


Ship and aircraft detection



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Develop Next Generation Coastal Radar Systems for Homeland Security Applications

Features of integrated system design include:

- Superior antenna array performance for portable and cost effective system
- Accurate propagation modeling
- Integrated propagation modeling with radiation characteristics to optimize system performance
- Implement adaptive DSP algorithm for beamforming, reconfigurable system with multipath mitigation and noise and clutter suppression capabilities
- Improved target detection and localization

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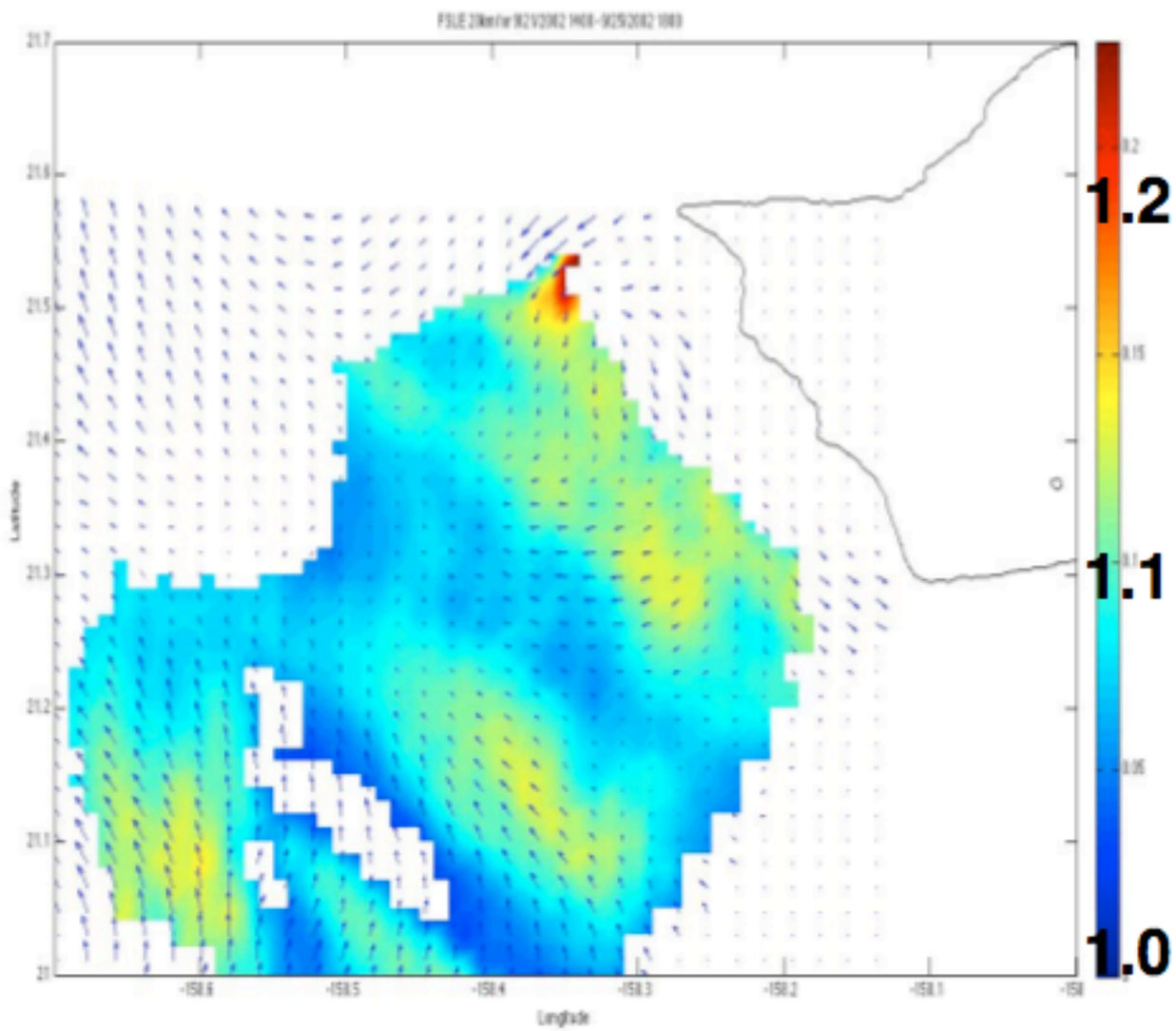
Collaboration with stakeholders:

graduate education for USCG officers through M.Sc. In Physical Oceanography

- 2009-2011: ??
- 2008-2010: Lt. Jacob Cass
- 2007-2009: Lt. Victoria Futch

- use Lyapunov Exponents (exponential rate of separation of fluid particles) to quantify stretching $\lambda(\mathbf{x},t,\delta_o, \delta_f) = (1/\tau)\log(\delta_f/\delta_o)$
- deploy pseudo-drifters in HF radar field for 100 hours, ensemble average
- deploy surplus USCG SAR buoys (70 received) to verify results



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HAWAII BEACH SAFETY

Consult lifeguard before entering the water
- WHEN IN DOUBT, DON'T GO OUT

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CURRENT BEACH ALERTS: OAHU

- Beach Event Oahu (Hanauma Bay Nature Preserve)
- High Surf Warning
- Box Jellyfish Watch
- Beach Event Oahu (Hanauma Bay Nature Preserve)

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SELECT BEACHES BY ISLAND

- Oahu
  - *North Shore
  - *West Shore
  - *South Shore
  - *East Shore
- Maui
- Kauai
- Hawaii

CURRENT RECOMMENDED BEACHES OAHU:

- Pokai Beach Park
- Duke Paoa Kahanamoku Beach Park
- Kapiolani Park Beach Center
- Kapiolani Beach Park
- Kuhio Beach Park
- San Souci Beach
- Ala Moana Beach Park

XML RSS Feed

CURRENT HAZARDOUS OR

Welcome to Hawaii Beach Safety—Oahu

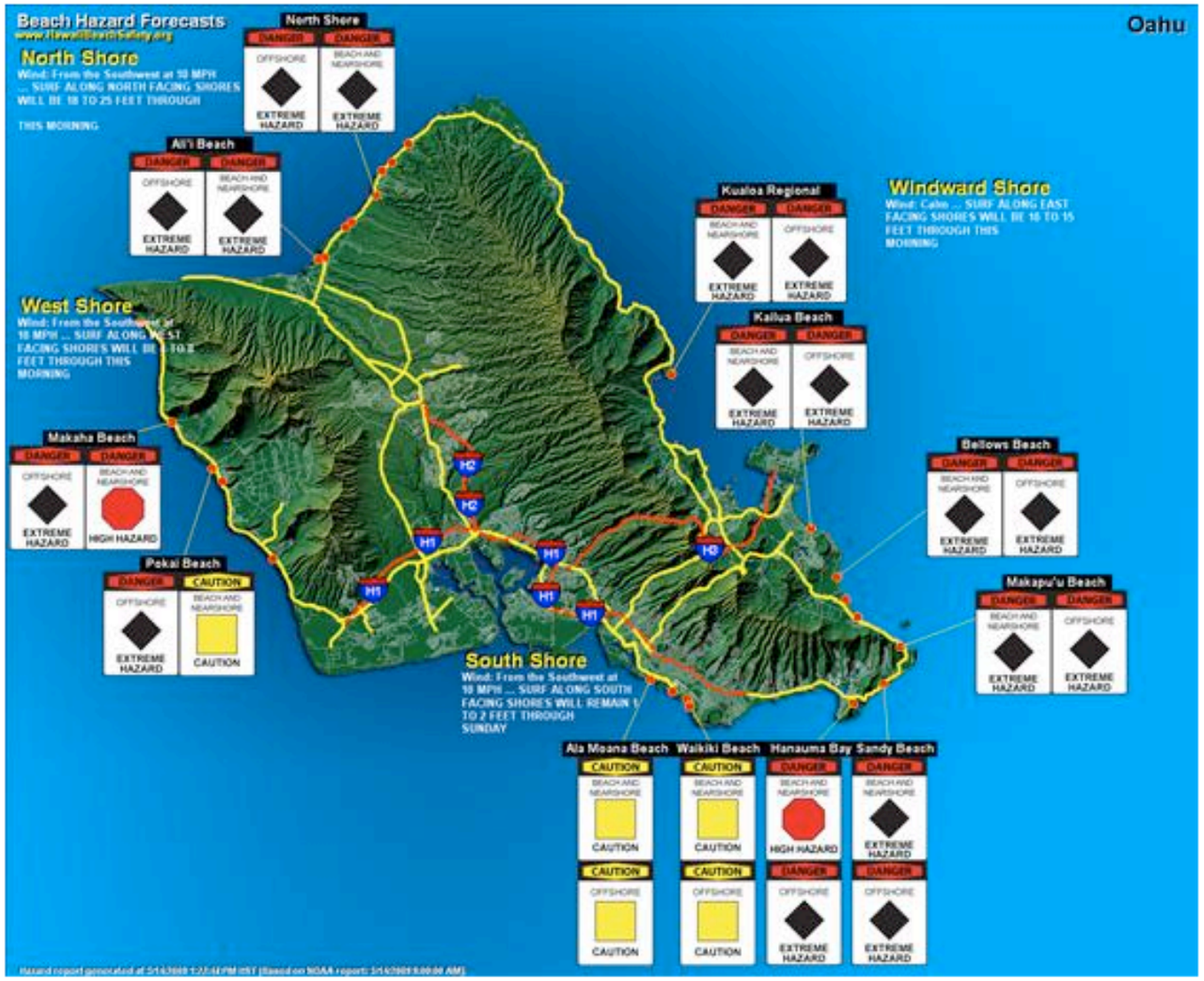
Your Web resource for beach safety conditions. Select an island, and click on a beach to view the latest wind and wave conditions and information.
Please note that signs are updated as conditions change.

Always swim near a lifeguard.

Please agree to our disclaimer. Click here.

Click here for a list of Hawaii's guarded beaches.

OAHU 3/14/2009



[1280x1024] [800x640] [Print]

Tide Prediction at Mokuoloe (Oahu), Honolulu (Oahu), Kahului (Maui), Nawiliwili (Kauai), Port Allen (Kauai), Kawaihae (Big Island), Hilo (Big Island)

FIN

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