

Ocean Observations In Support of Decision-Making for Maritime Operations



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Transportation
Research Board
Irvine, CA
June 29, 2010



IOOS® INTEGRATED OCEAN OBSERVING SYSTEM

southern california bight

-  Buoy
-  Mooring
-  Glider Track
-  SCCOOS Shore Station



Southern California Coastal
Observing System -SCCOOS

SCCOOS Surface Currents



HF Radar, Santa Catalina provides surface currents

Coastal Data Information Program



- Based at SIO since 1975
- 43 Wave Stations
LIDAR & In-Situ Beach
Surveys
- 17 People
- Major Funding by:
USACE, CDBW
- Partners
(IOOS, NOAA
CA Coastal Conservancy
ONR/NAVY...)

CDIP Mission:

Monitor and predict
nearshore waves and
shoreline change.

CDIP Wave Buoys – NAVIGATION



<http://cdip.ucsd.edu>

Case Examples demonstrating the value of Ocean Observations

Metrics

Safety, Economics, Environment

Los Angeles/Long Beach

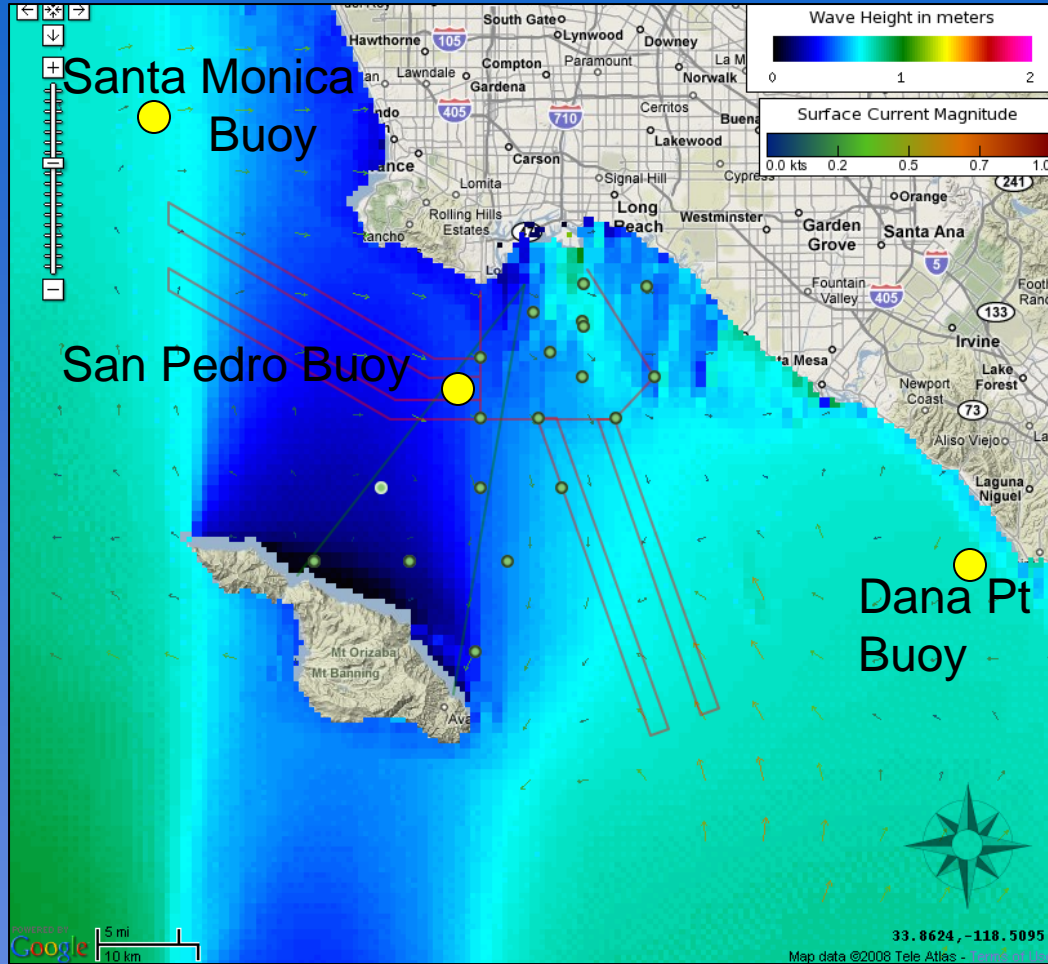
San Francisco

Mouth of the Columbia

Kaunapali, Lanai

Gulf of Mexico

Ports of LA/LB *Economics & Environment*

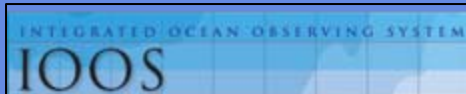


CDIP providing wave observations, forecasts.

Southern California Coastal Observing System (SCCOOS) providing HF Radar surface currents

USACE - LAD
Catalina Express
Los Angeles Bar Pilots
Long Beach Bar Pilots
NOAA - Navigation
San Pedro Marine Exchange
Sause Brothers
US Coast Guard

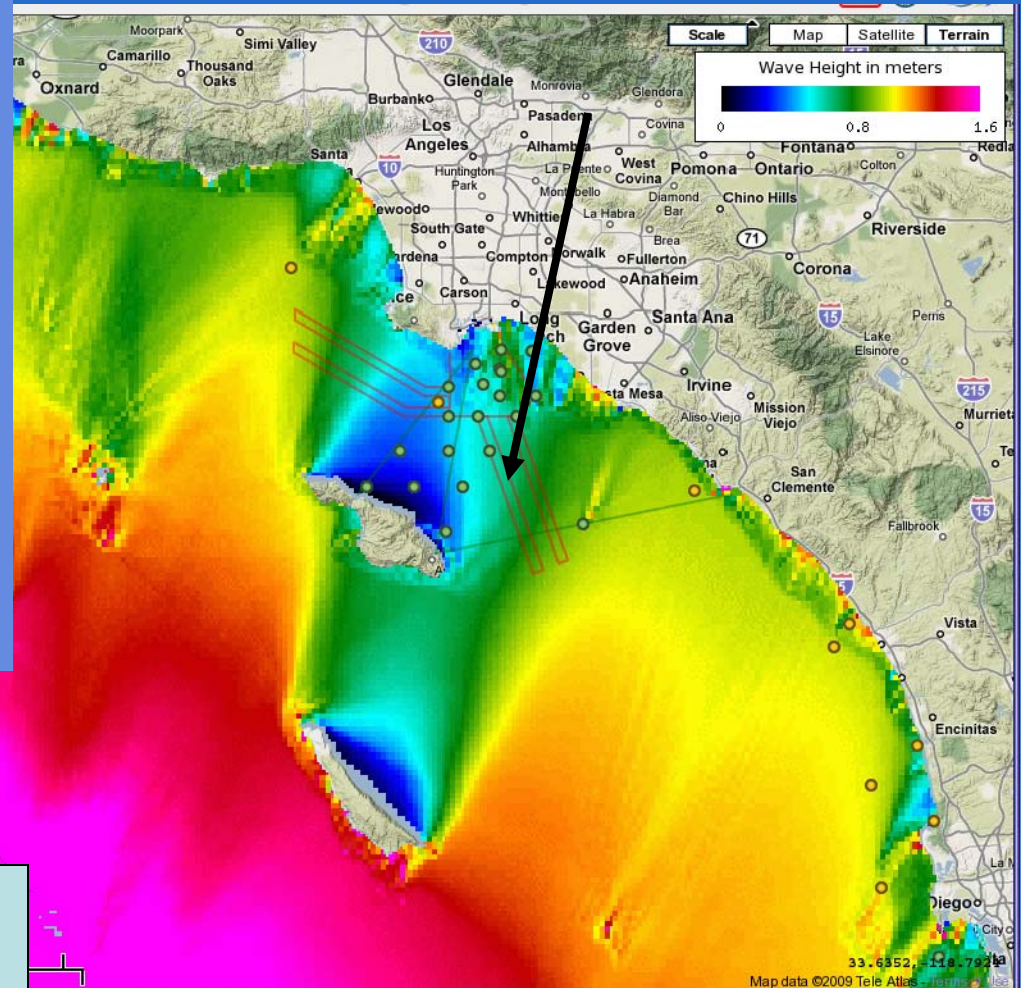
<http://www.sccoos.org/data/harbors/lalb/fullscreen.php>



PORT of Los Angeles and Long Beach

CDIP's high resolution wave models allows for accurate forecasts.

Spatial variation due to island shadowing allows coastal variability. Wave heights differ according to direction of the waves.



Big waves, big trouble?
headline in
Occounty.com, Jul 24, 2009

Port of Long Beach – Jacobsen Pilots

3 day alert messaging for long period (10-22 sec), energetic wave forecast.

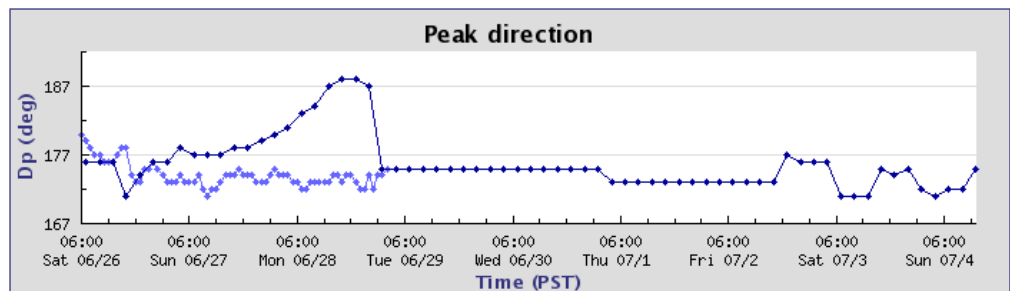
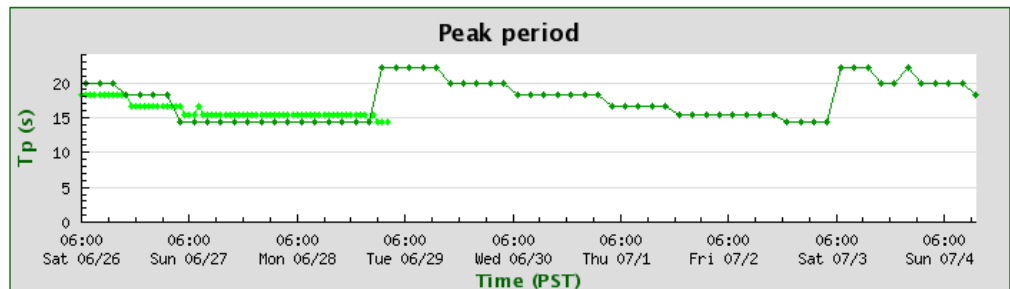
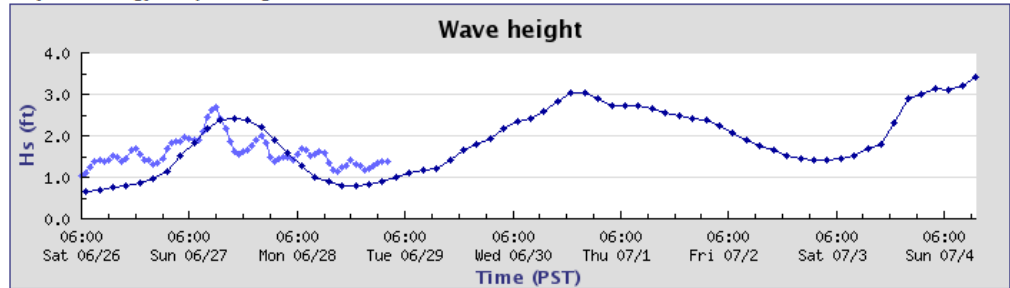
Long super tankers will start to pitch in long period waves, Thus creating a possible under-keel clearance problem.

Swell Forecast: 14 sec period cutoff

Select period cutoff: 8 secs 10 secs 12 secs 14 secs 16 secs

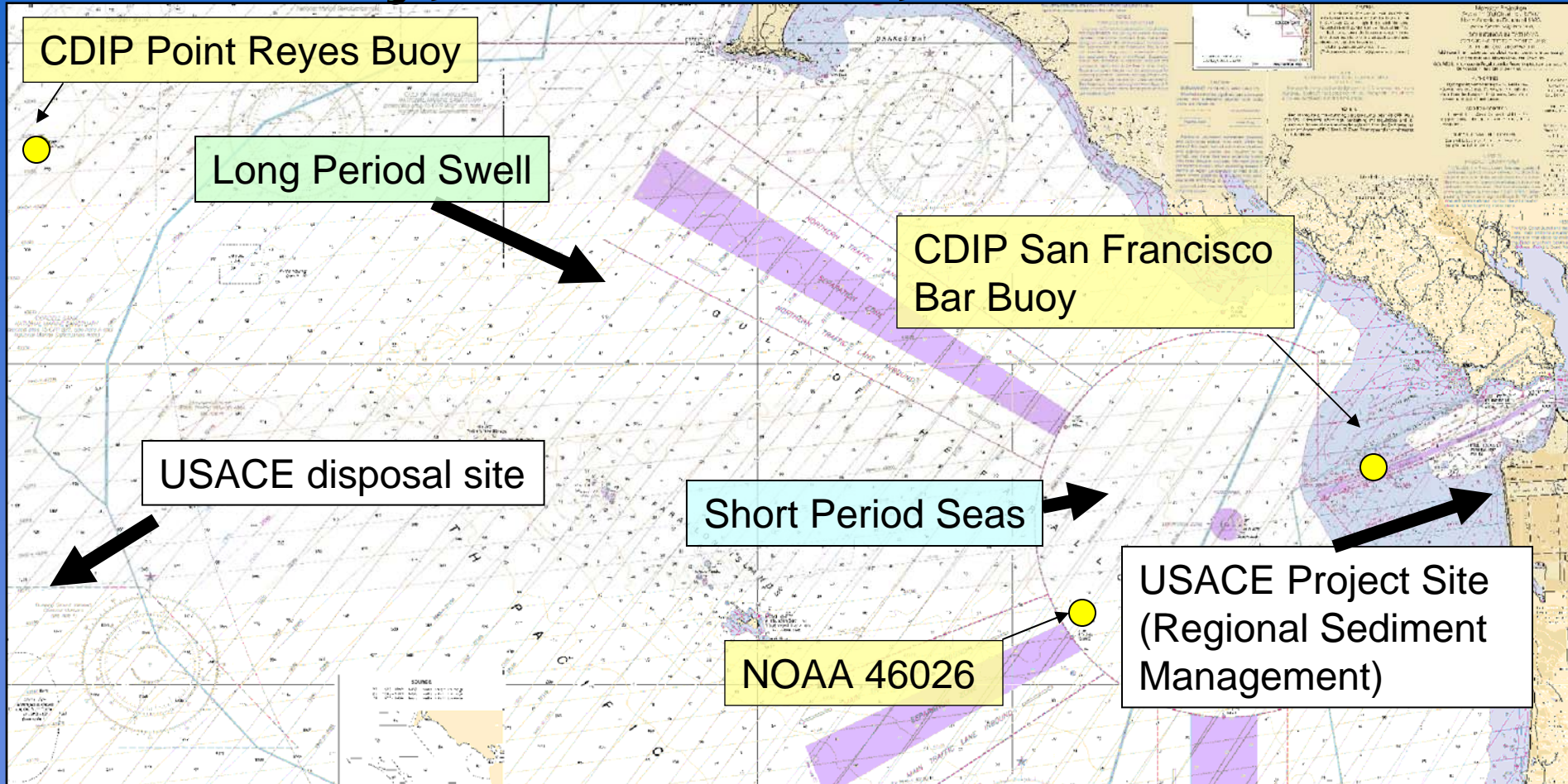
Model output using WW3 forecasts and buoy observations as input.

Only wave energy with periods greater than 14 seconds considered.



San Francisco

Safety, Economics, Environment

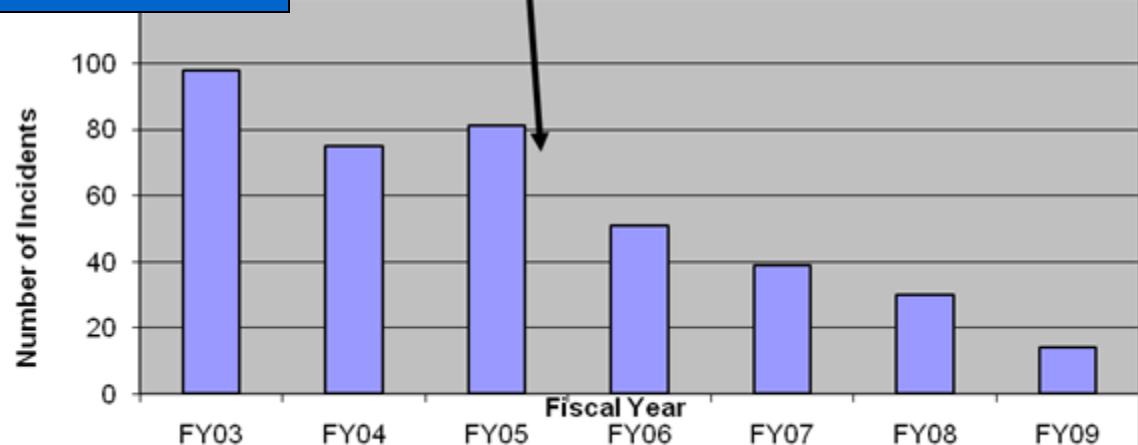


San Francisco - SAFETY

Fiscal Year (FY)	Surf Cases	IVO of SF Bar	Total
FY03	32	98	130
FY04	28	75	103
FY05	29	81	110
FY06	18	51	69
FY07	20	39	59
FY08	19	30	49
FY09	11	14	25
TOTAL:	157	388	545

Marine Incidents (rescues) near SF Bar

Bar Forecast Begun by MTR



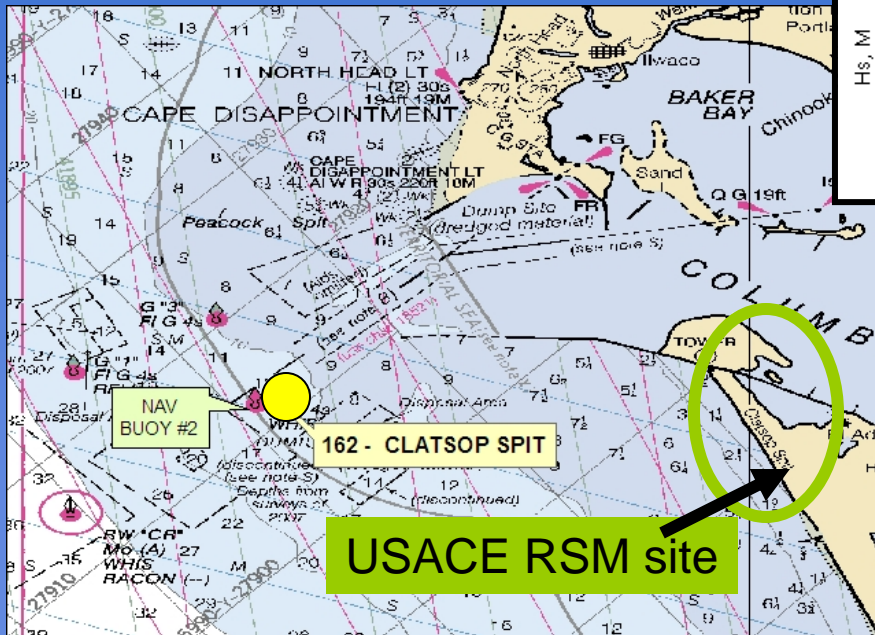
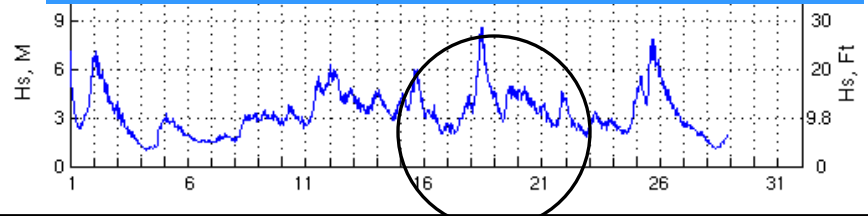
Incidents in the Vicinity of SF Bar (IVO)

Data supplied by the Coast Guard. Assimilated and Disseminated by the SF NWS Office.

Mouth of the Columbia - SAFETY

Mouth of the Columbia River installation supports projects as Regional Sediment Management (RSM) for the USACE Portland District, Bar Pilots and commercial fishing. This buoy is critical for safety and efficiency of maritime transportation.

CDIP buoy measured 9m significant height waves in Jan 2010



Job Corps Vessel Ironwood
Deploys buoy

Mouth of the Columbia River

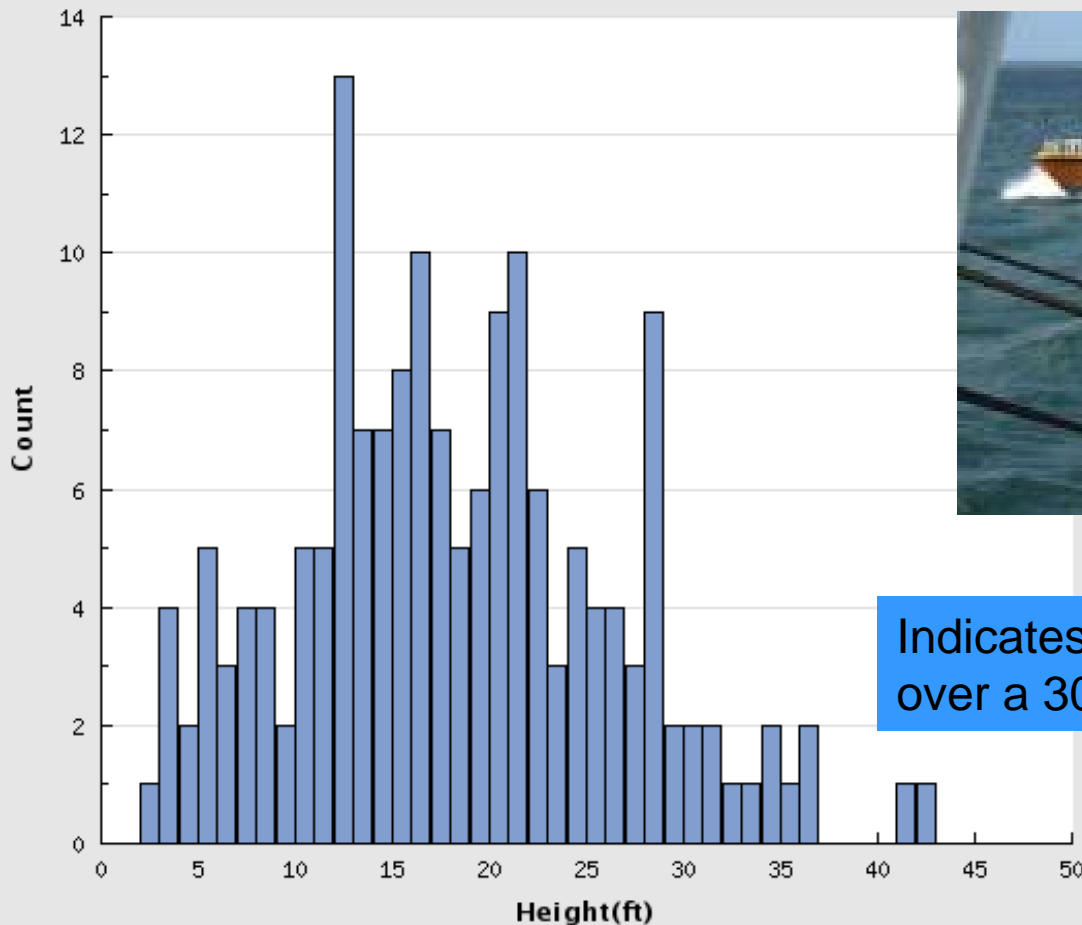
SAFETY

Station 162 trough-to-crest wave heights

Sample start time: 2010-05-20 03:10 UTC

Largest wave: 42.95 ft

H1/10: 35.21 ft



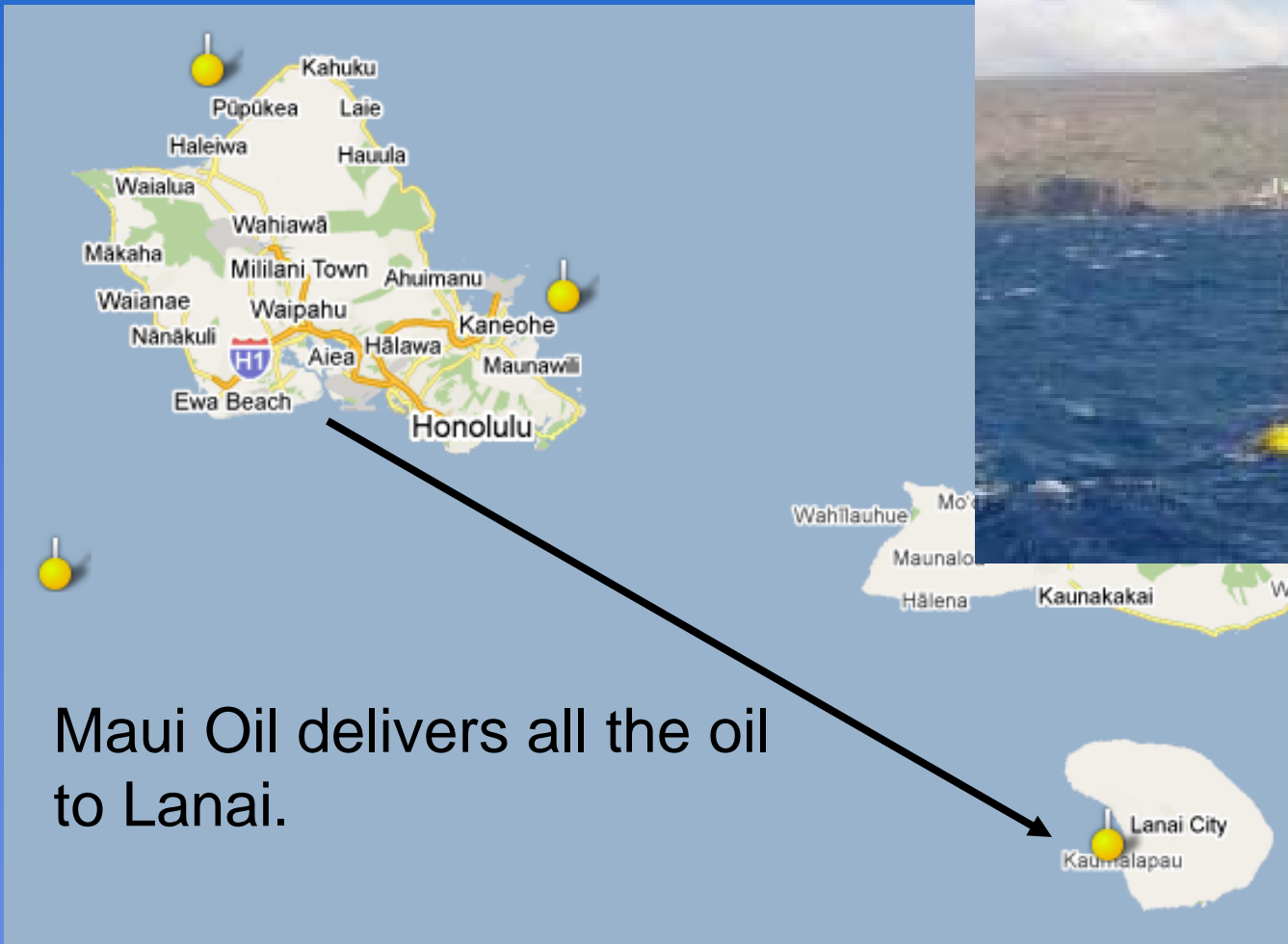
Indicates the highest, single wave over a 30 minute interval.

Kaumalapau, Lanai

Environment & Economics



> 14ft waves at
Entrance to
Harbor.



Kaumalapau, Lanai

Safety, Environment & Economics



Loading Dock

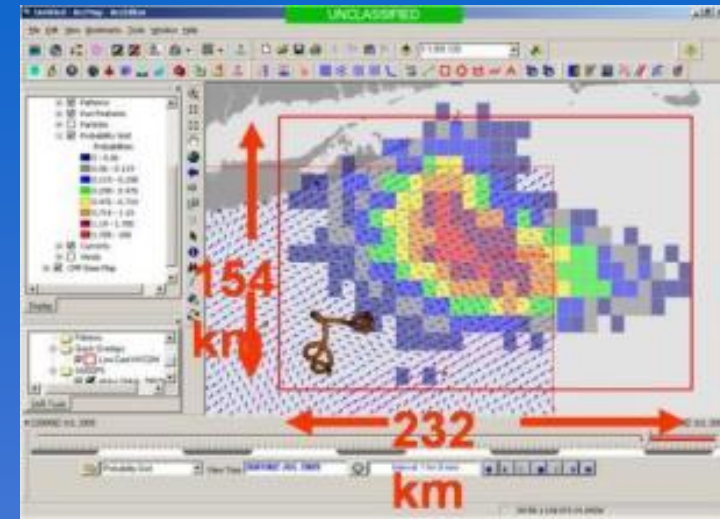


Kaumalapau Harbor

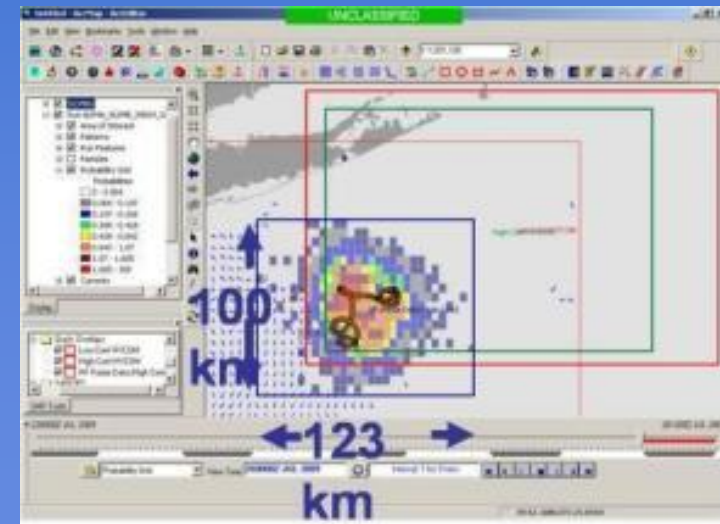
Before 1997, when the buoy was installed, the barge would have to abort without offloading in Harbor. Costs \$22,000 to divert MauiOil Barge back to Honolulu.

U.S. IOOS: Increasing Safety

- More than 100 High Frequency Radars
- Uses: Search and Rescue, Oil Spills, Harmful Algal Blooms, Ocean Circulation



96 hr: Without HFR (36,000 Km²)



96 hr: With HFR (12,000 Km²)



U.S. IOOS: DeepWater Horizon Portal

Real-time IOOS Assets

- HF Radar
- Satellite
- Glider Fleet Positions
- Forecasts

<http://rucool.marine.rutgers.edu/deepwater>


DeepWater Horizon Oil Spill

IOOS Response to BP Spill in the Gulf of Mexico

[Home](#) | [DeepWater Blog](#) | [Forecasts](#) | [Google Earth KMZs](#) | [IOOS Assets](#) | [Latest Media](#) | [Partners](#)

Welcome to Deepwater Horizon Oil Spill Portal

June 18th, 2010

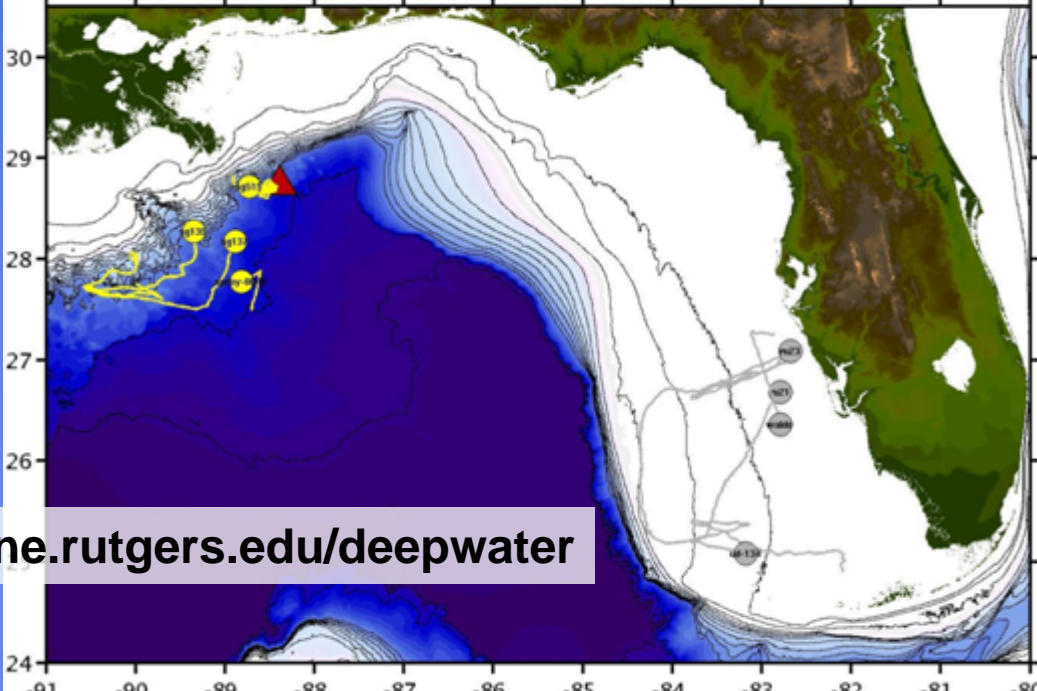


AP Photo/Gerald Herbert


The Deepwater Horizon oil spill is a massive tragedy for the Gulf of Mexico that started on April 20, 2010. Currently a large community of partners are working together to mitigate/manage the response to the spill.

As part of those efforts, our team, which includes partners from several federal agencies, companies, many universities and non-profits are developing a portal that will consolidate many data streams to help response efforts. This portal is a team effort and is open to all partners.

Mon Jun 21 18:00:35 UTC 2010



[Click play button or drag scrollbar to track oil spill](#)



[CLICK HERE for a day-by-day look at the growing oil spill off the Louisiana coast.](#)

Register and Contribute

- [Register](#)
- [Log in](#)

Blog

- [DeepWater Blog \(77\)](#)

Contributed Data Resources

- [Google Earth KMZs \(4\)](#)
- [IOOS Assets \(9\)](#)
 - [IOOS Assets: AUV \(6\)](#)
 - [IOOS Assets: HF-Radar \(2\)](#)
 - [IOOS Assets: Satellite \(3\)](#)
- [Forecasts \(17\)](#)
 - [Forecast: Ocean \(16\)](#)
 - [Forecast: Atmospheric \(1\)](#)
- [Latest Media \(27\)](#)

SUMMARY

It is critical that the ocean observation infrastructure is in place to assure the safety of our maritime community, to promote the economic health of maritime transportation and to protect our environment.

