

## Pacific Islands Ocean Observing System

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Majuro  
Republic of the Marshall Islands  
April 24, 2013

*US IOOS<sup>®</sup>: A Partnership for Lives and Livelihoods*



# Wave Observations

## Majuro deployment





18:55:08 UTC

Map Satellite Hybrid



station# 163 KALO, MAJURO, MARSHALL ISLANDS

gps hits 10

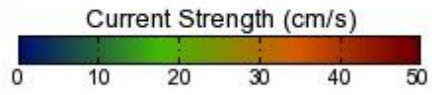
all classes

send

CDIP Diagnostics SoCal JPL Trajectory Tool

Day	Time (UTC)	Latitude (dd)	Longitude (dd)	Lat (dec min)	Lon (dec min)	d from dep (nm)	time gap (hh:mm)	d from prev (nm)	speed (kts)	dir (degTN)	class
02/11/2013	10:30	7.11380	171.37300	7 06.828	171 22.380	1.91	00:30	0.06	0.13	238.9	3
02/11/2013	10:00	7.11436	171.37393	7 06.861	171 22.436	1.90	00:30	0.27	0.55	277.9	3
02/11/2013	09:30	7.11373	171.37848	7 06.824	171 22.709	1.71	00:30	0.60	1.20	280.5	3
02/11/2013	09:00	7.11190	171.38841	7 06.714	171 23.305	1.39	00:30	0.77	1.54	326.0	3
02/11/2013	08:30	7.10125	171.39566	7 06.075	171 23.740	0.73	01:30	0.46	0.30	349.1	3
02/11/2013	07:00	7.09377	171.39711	7 05.626	171 23.827	0.35	00:30	0.14	0.27	339.9	3
02/11/2013	06:30	7.09162	171.39790	7 05.497	171 23.874	0.30	00:30	0.16	0.31	358.7	3
02/11/2013	06:00	7.08904	171.39796	7 05.342	171 23.878	0.27	00:30	0.16	0.32	19.5	3
02/11/2013	05:30	7.08651	171.39706	7 05.191	171 23.824	0.27	00:30	0.10	0.20	35.0	3
02/11/2013	05:00	7.08515	171.39610	7 05.109	171 23.766	0.30	00:30	0.09	0.17	57.1	3

○ = buoy watch circle (1.73 \* depth)  
○ = buoy offsite threshold





**THANK YOU!!**

Ken Kramer

Don Hess

Winson Bosin

Reggie White

Johnny Milne

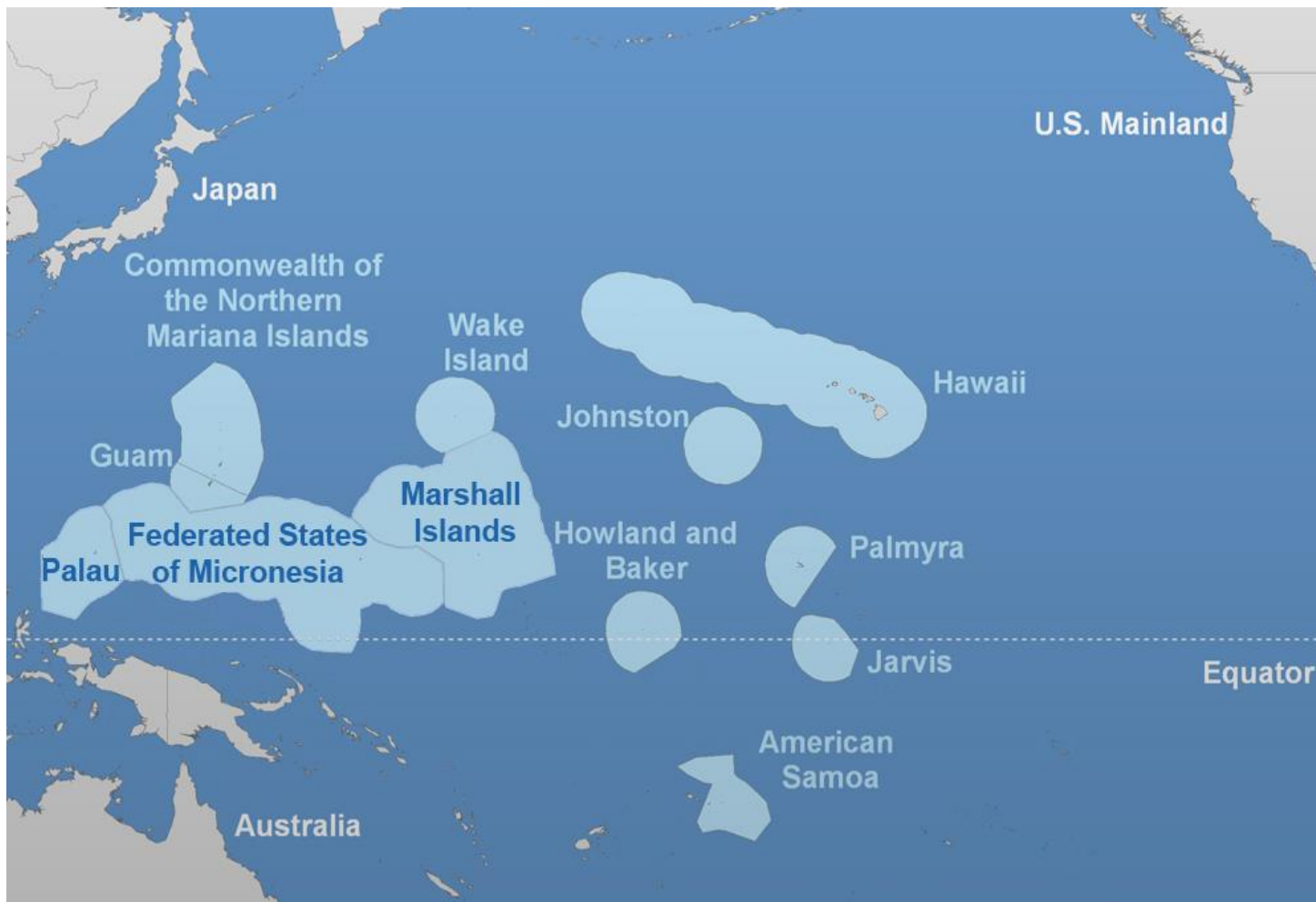


2013/02/11

# Pacific Islands Ocean Observing System

PacOOS

*by observing we learn*



Hawaii  
American Samoa  
N Mariana Islands  
Micronesia (FSM)  
Guam  
Marshall Islands  
Palau  
Wake Island  
Johnston Atoll  
Howland Baker Is  
Palmyra Island  
Jarvis Island



# PacIOOS MOA Partners

## Hawaii

- Liquid Robotics
- UH- SOEST
- Hawaii Department of Transportation – Harbors
- Hawaii Office of Planning
- Hawaii Harbors User Group
- Marine and Coastal Zone Advocacy Council
- Archinoetics, Inc.
- Malama Maunalua
- Maui Ocean Center
- U.S. Coast Guard D-14
- Kohala Center

## Regional

- NOAA – PIFSC
- WPR Fishery Management Council
- Outrigger Enterprises, Inc.
- US Army Corps of Engineers
- SAIC
- CODAR Ocean Sensors
- U.S. Pacific Command
- Pacific Disaster Center

## Republic of the Marshall Islands

- [College of the Marshall Islands](#)

## Federated States of Micronesia

- College of Micronesia

## Palau

- Palau International Coral Reef Center
- Coral Reef Research Foundation

## American Samoa

- American Samoa EPA
- Department of Marine and Wildlife Resources

## Guam

- Guam, Office of the Governor
- University of Guam Sea Grant

## CNMI

- CNMI, Office of the Governor
- Pacific Marine Resources Institute

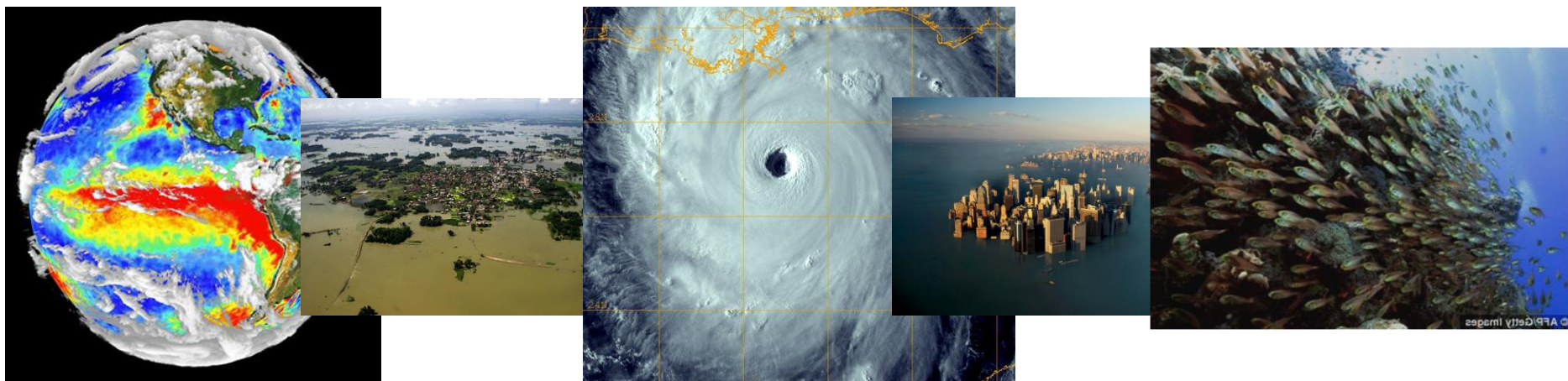
# PacIOOS Council Members

- Mr. Chris Ostrander, UH Manoa – SOEST
- Mr. Jesse Souki, State of Hawaii Office of Planning
- Mr. Davis Yogi, State of Hawaii Department of Transportation, Harbors Division
- Ms. Donna Brown, Marine and Coastal Zone Advocacy Council
- Dr. Kyle VanderLugt, Liquid Robotics
- Mr. Gary North, Hawaii Harbors User Group
- Dr. John Joyner, Governors Office, CNMI
- Dr. Ruth Matagi-Tofiga, American Samoa Dept of Marine and Wildlife Resources
- Dr. Rusty Brainard, NOAA PIFSC
- Mr. McGrew Rice, WPR Fisheries Management Council
- Mr. Todd Barnes, USACE, Honolulu
- Dr. Chuck Kelley, Outrigger Enterprises
- CDR Joyce Blanchard, U.S. Navy Pacific Fleet
- [Mr. Don Hess, College of the Marshall Islands](#)
- Dr. Yim Golbuu, Palau International Coral Reef Center
- Mr. Brian Lynch, College of Micronesia
- Mr. Joseph Artero-Cameron, Guam Department of Chamorro Affairs
- Mr. Richard Roberts, US Coast Guard District 14

# Pacific Islands Ocean Observing System

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Information to address global, societal, complex issues



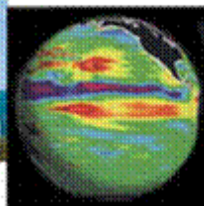
Disasters



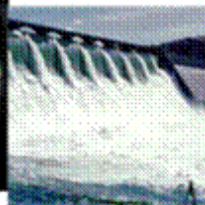
Health



Energy



Climate



Water



Weather



Ecosystems



Agriculture



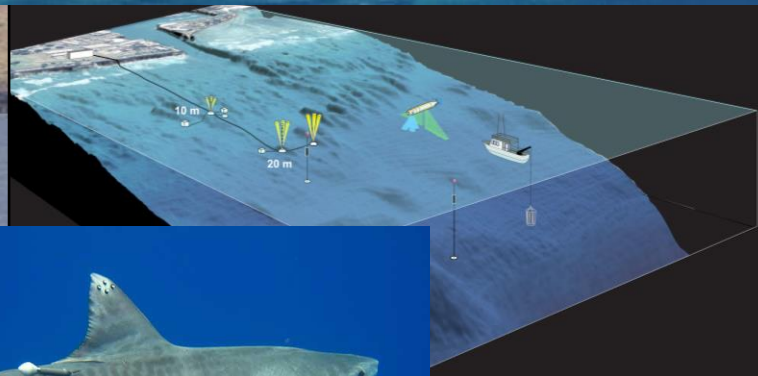
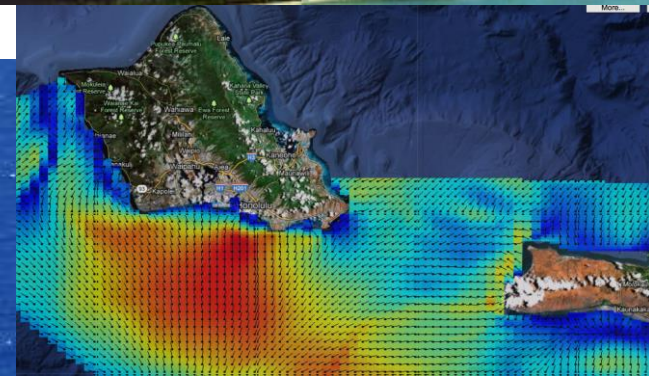
Biodiversity



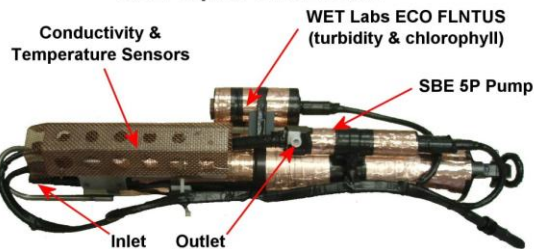
# Pacific Islands Ocean Observing System

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SBE 1plus V2 SEACAT

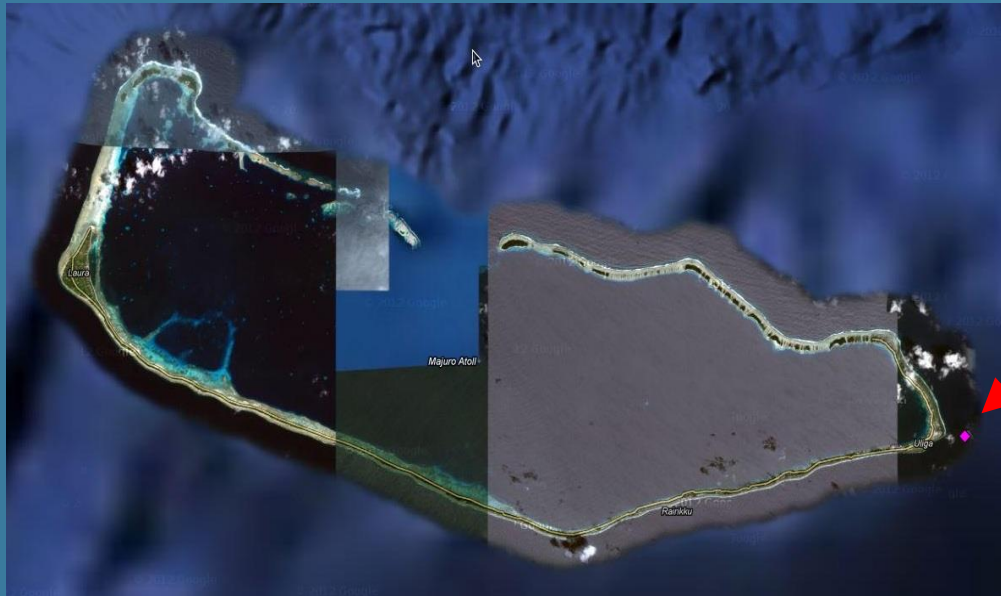


(Note copper cladding is used to control biofouling)



# Wave Observations

## Current live locations provided by PacIOOS

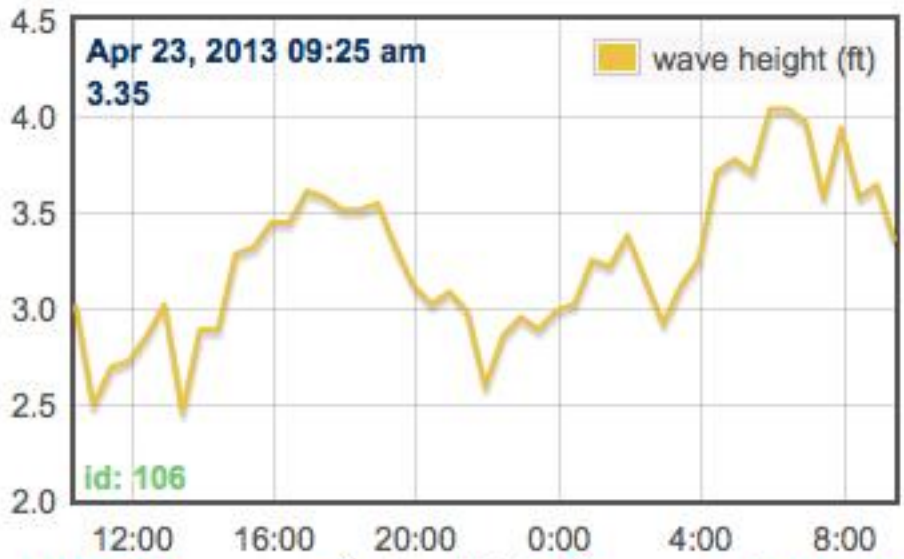


### Majuro (Kalo)

The additional data provided by the Kalo Buoy enhanced our capability to provide reliable wave information and conditions to the mariners and the coastal communities. We are able to provide quality advisories and warnings and have saved lives and better protected coastal properties. - R. White



### PacIOOS Wave Buoy



[more info](#)

← date (HST) →

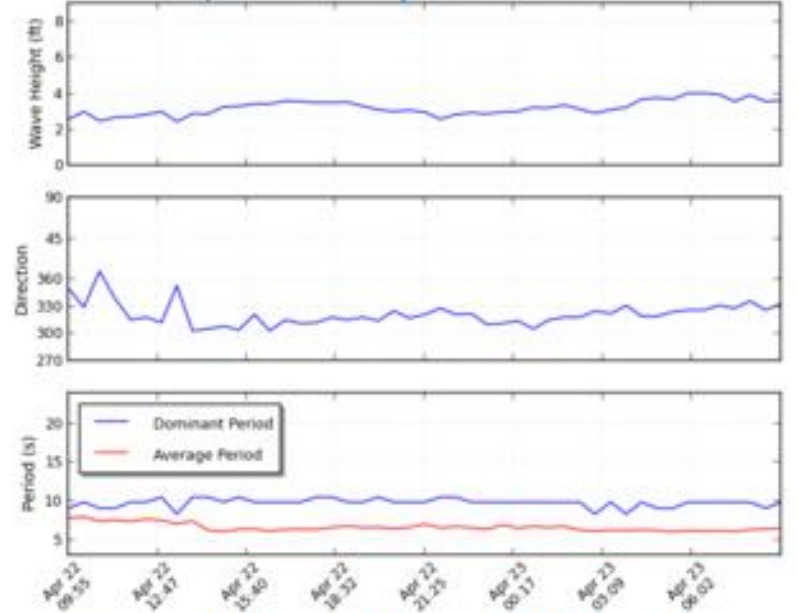
[show stats](#)



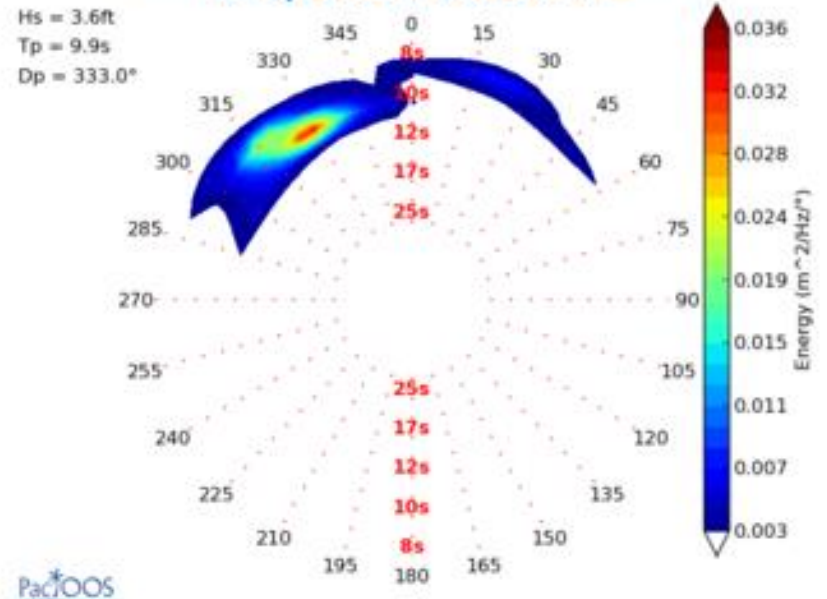
Waimea Buoy: recent observations

Time/Date	Sig. Wave Height (ft)	Direction (deg)	Dominant Period (s)	Average Period (s)	Sea Surface Temp (F)
06:55, Tue Apr 23 2013	3.64	293.0	9.99	4.51	76.6
08:25, Tue Apr 23 2013	3.58	326.0	9.00	6.4	76.3
07:55, Tue Apr 23 2013	3.94	336.0	9.99	4.32	76.1
07:25, Tue Apr 23 2013	3.58	328.0	9.99	4.05	76.1
06:55, Tue Apr 23 2013	2.97	331.0	8.88	4.17	76.1
06:25, Tue Apr 23 2013	4.03	326.0	9.99	4.12	76.1
05:55, Tue Apr 23 2013	4.03	326.0	9.99	6.2	76.1
05:25, Tue Apr 23 2013	3.13	324.0	9.00	4.03	76.1
04:55, Tue Apr 23 2013	3.77	319.0	9.00	4.29	76.1
04:25, Tue Apr 23 2013	3.73	319.0	9.99	4.29	76.1
03:55, Tue Apr 23 2013	3.25	331.0	8.33	4.22	76.1
03:25, Tue Apr 23 2013	3.12	332.0	9.99	4.26	76.1
02:55, Tue Apr 23 2013	2.92	325.0	8.33	4.34	76.1
02:25, Tue Apr 23 2013	3.15	314.0	9.99	4.26	76.1
01:55, Tue Apr 23 2013	3.38	314.0	9.99	4.73	76.1
01:25, Tue Apr 23 2013	3.13	315.0	9.99	4.61	76.1
00:55, Tue Apr 23 2013	3.25	308.0	9.99	4.74	76.1
00:25, Tue Apr 23 2013	3.02	314.0	9.99	4.53	76.1
23:55, Mon Apr 22 2013	2.98	311.0	9.99	4.95	76.1
23:25, Mon Apr 22 2013	2.89	310.0	9.99	4.37	76.1
22:55, Mon Apr 22 2013	2.95	323.0	9.99	4.38	76.3
22:25, Mon Apr 22 2013	2.89	321.0	10.93	4.72	76.1
21:55, Mon Apr 22 2013	2.99	328.0	10.93	4.96	76.1
21:25, Mon Apr 22 2013	2.98	321.0	9.99	7.06	76.1
20:55, Mon Apr 22 2013	3.08	317.0	9.99	6.4	76.1
20:25, Mon Apr 22 2013	3.02	325.0	9.99	4.46	76.1
19:55, Mon Apr 22 2013	3.12	314.0	10.93	4.64	76.1
19:25, Mon Apr 22 2013	3.33	314.0	9.99	6.4	76.1
18:55, Mon Apr 22 2013	3.54	315.0	9.99	4.36	76.3
18:25, Mon Apr 22 2013	3.53	318.0	10.93	4.61	76.1
17:55, Mon Apr 22 2013	3.53	317.0	10.93	4.34	76.3

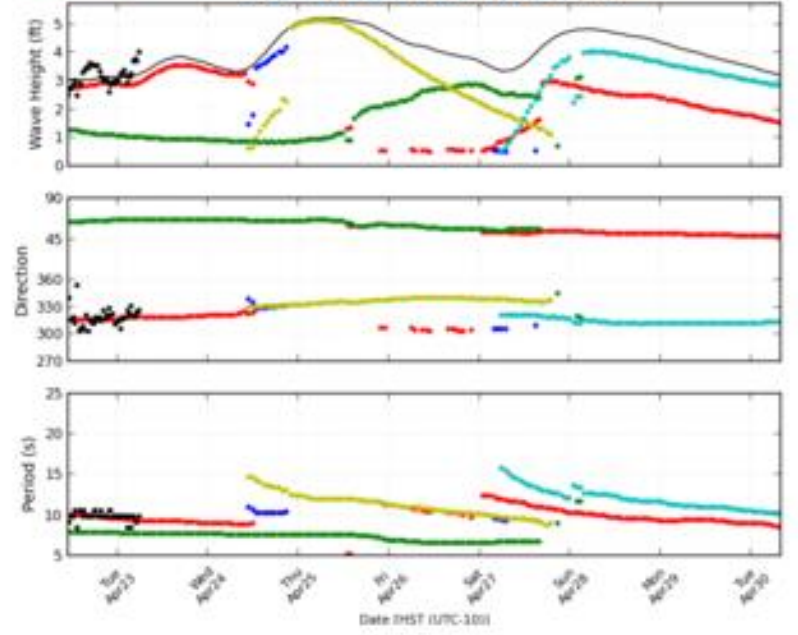
PacIOOS Wave buoy output for Waimea Updated: Tue Apr 23 2013 at 08:55



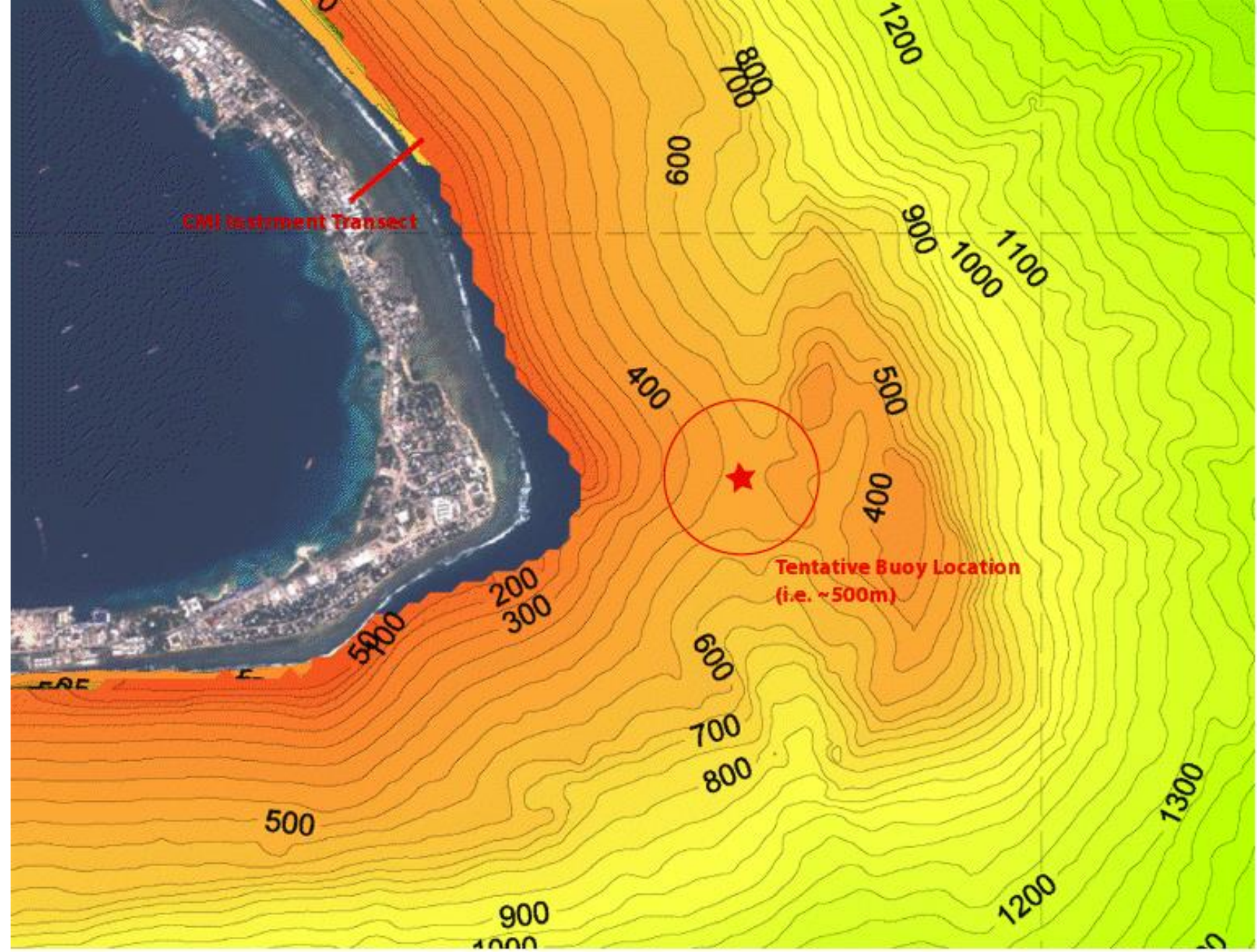
Wave buoy spectra for Location: Waimea Tue Apr 23 2013 at 09:24 HST



PacIOOS WWill Model Forecast for Waimea Model run: 20130423 6 UTC

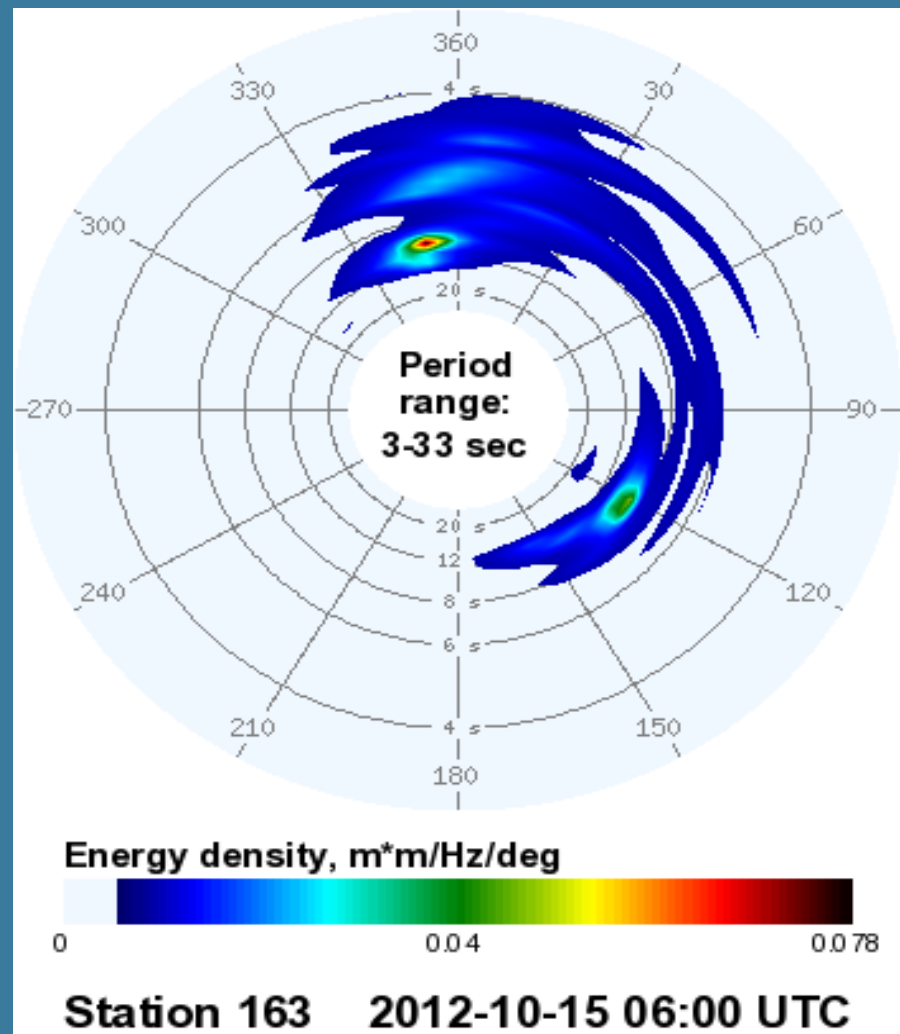






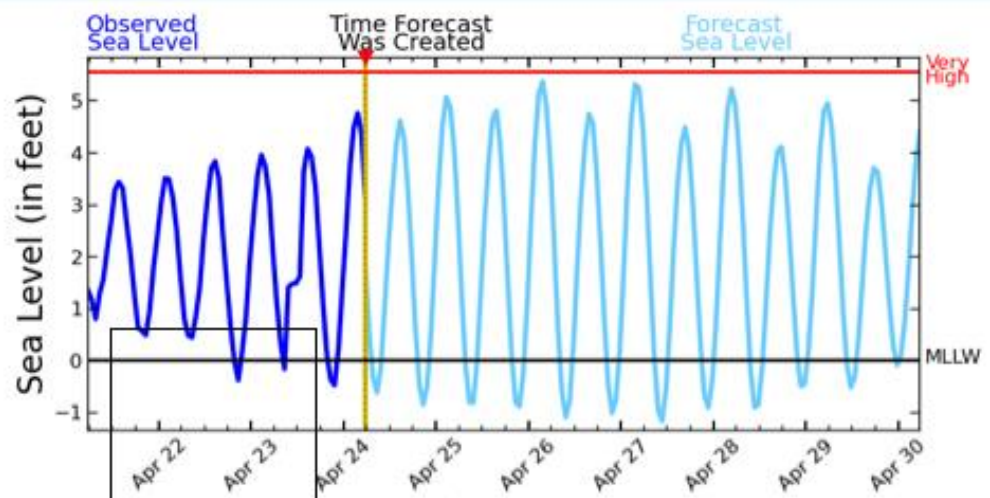
# Wave Observations

Majuro real time spectral energy density form CDIP. This data allows for the spatial differentiation of incoming swell. With local directional swell, accurate run-up and inundation forecast become possible.



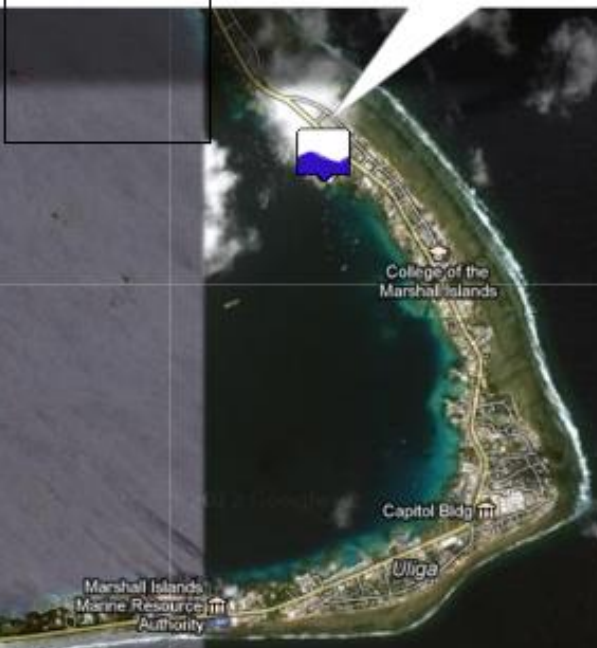


### High Sea Level Forecast



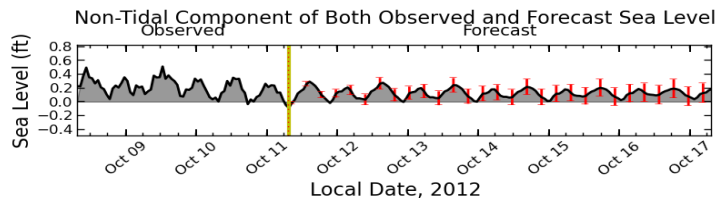
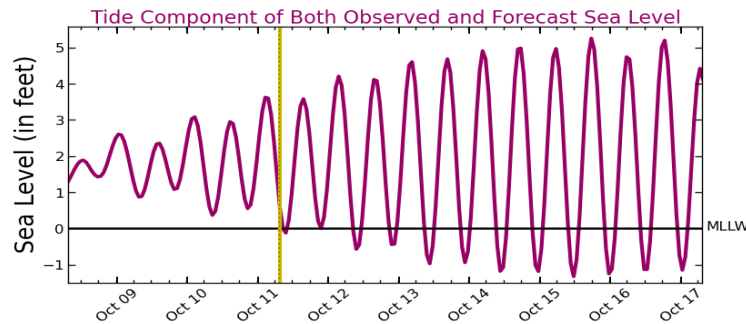
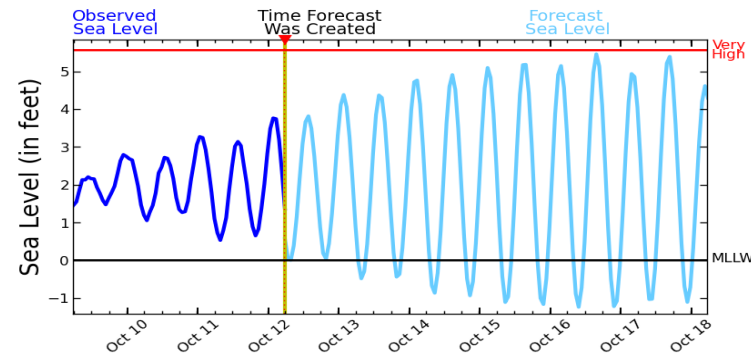
Local Date, 2013

Majuro Atoll, Republic of the Marshall Islands



# Sea Level Forecast for Harbors/Lagoons

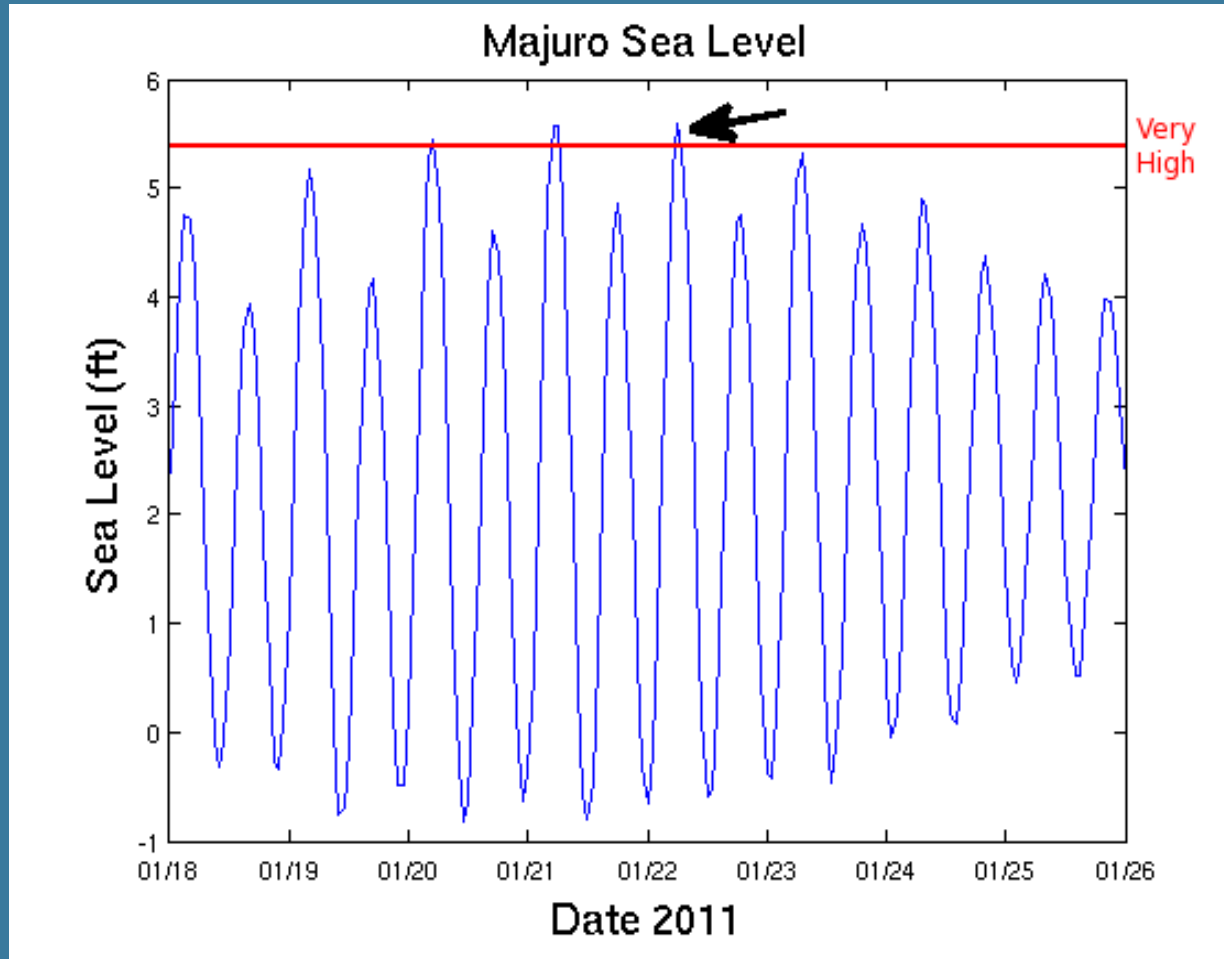
Components of the “Forecast of Potential for High Sea Level at **Majuro Atoll (Uluga Dock), Marshall Is.**”



Example of PacIOOS Majuro sea level forecast. Second page shows the forecast tide and residual forecast. Only two products are necessary to create a forecast for each station, a historical sea level record and real time sea level.



# Sea Level Forecast for Harbors/Lagoons

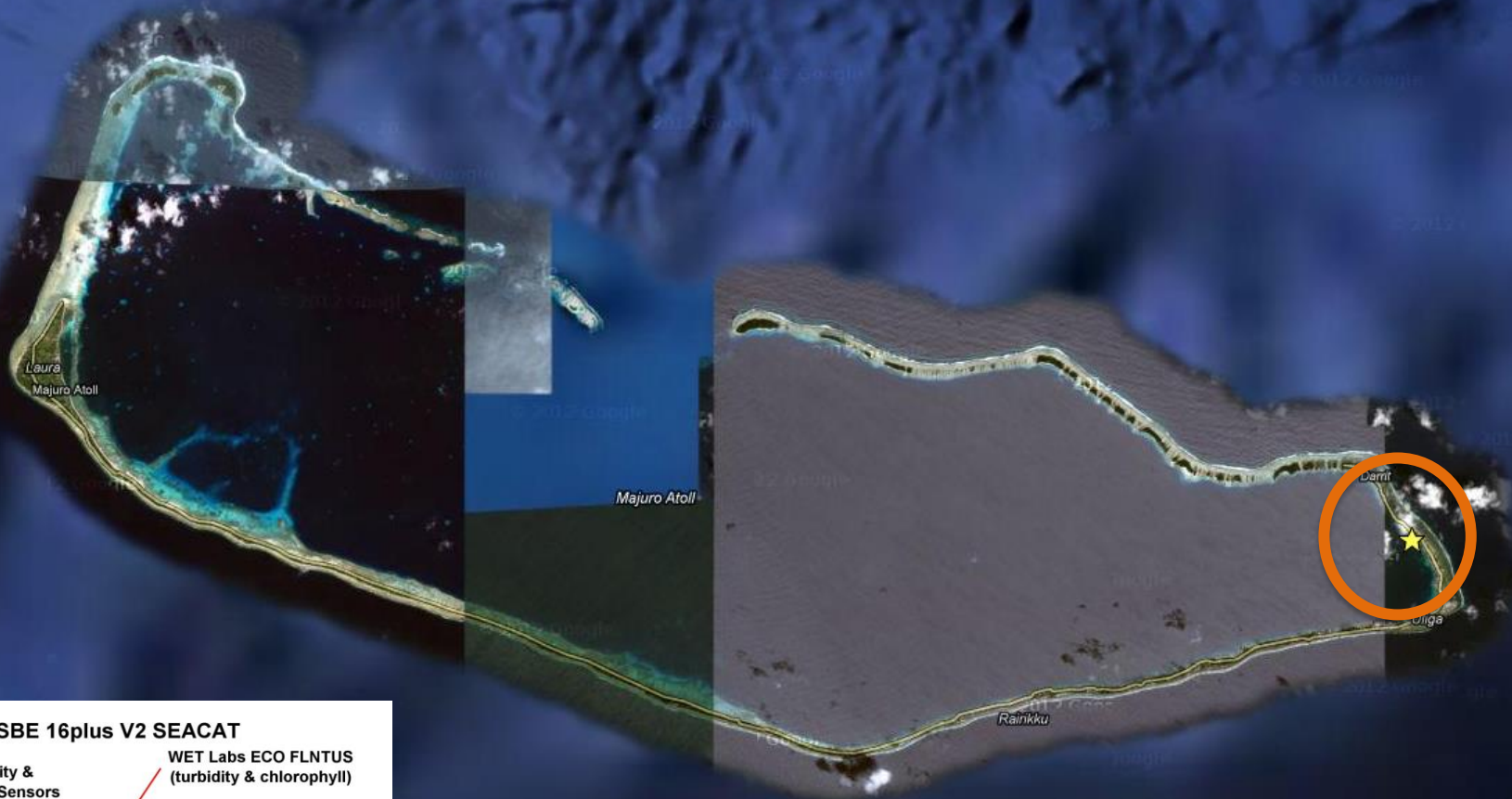


An Example of Majuro Atoll Sea Level Driven to Higher Levels Resulting in Roadway Flooding (video)

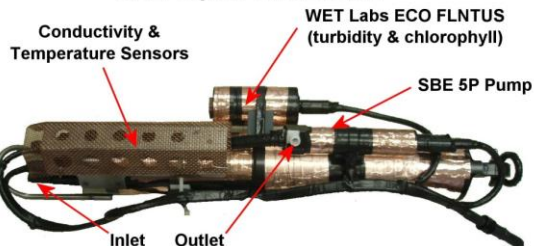
# Pacific Islands Ocean Observing System

PacOOS

*by observing we learn*



## SBE 16plus V2 SEACAT



(Note copper cladding is used to control biofouling)



# Water Quality

O'ahu

*Hawai'i*

Maui

*Hawai'i*

Hawai'i

*Hawai'i*

Tutuila

*American Samoa*

Koror

*Palau*

Saipan and Guam

*Mariana Islands*

Pohnpei

*FSM*

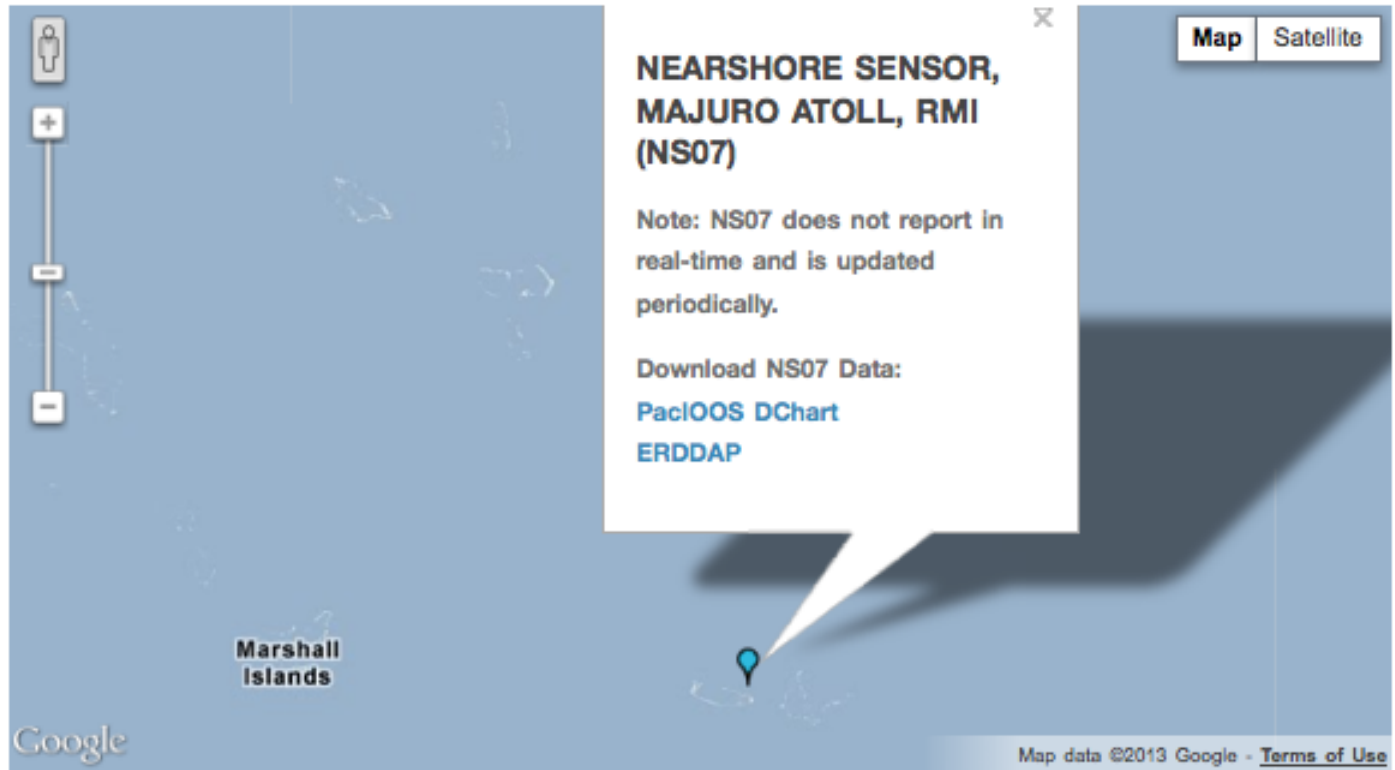
Majuro

*Marshall Islands*

*Parameters*

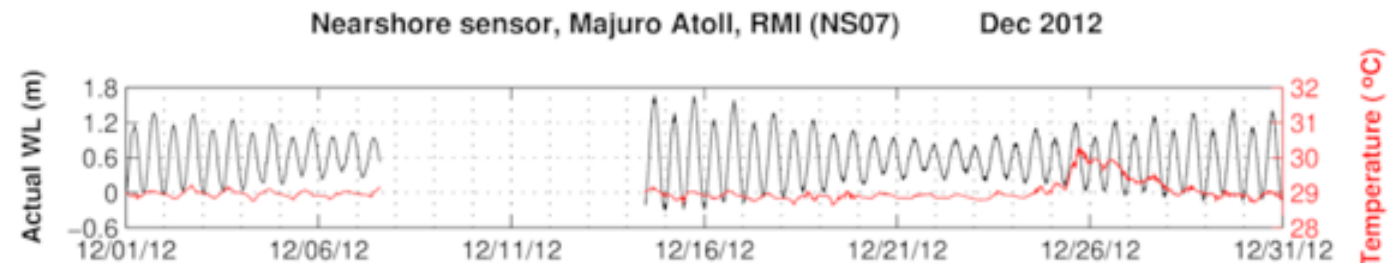
## Majuro

Click on the location of interest to view the most recent data available for the site. Use the drop down menu below to obtain historical plots. Click [here](#) for more information on water quality parameters.



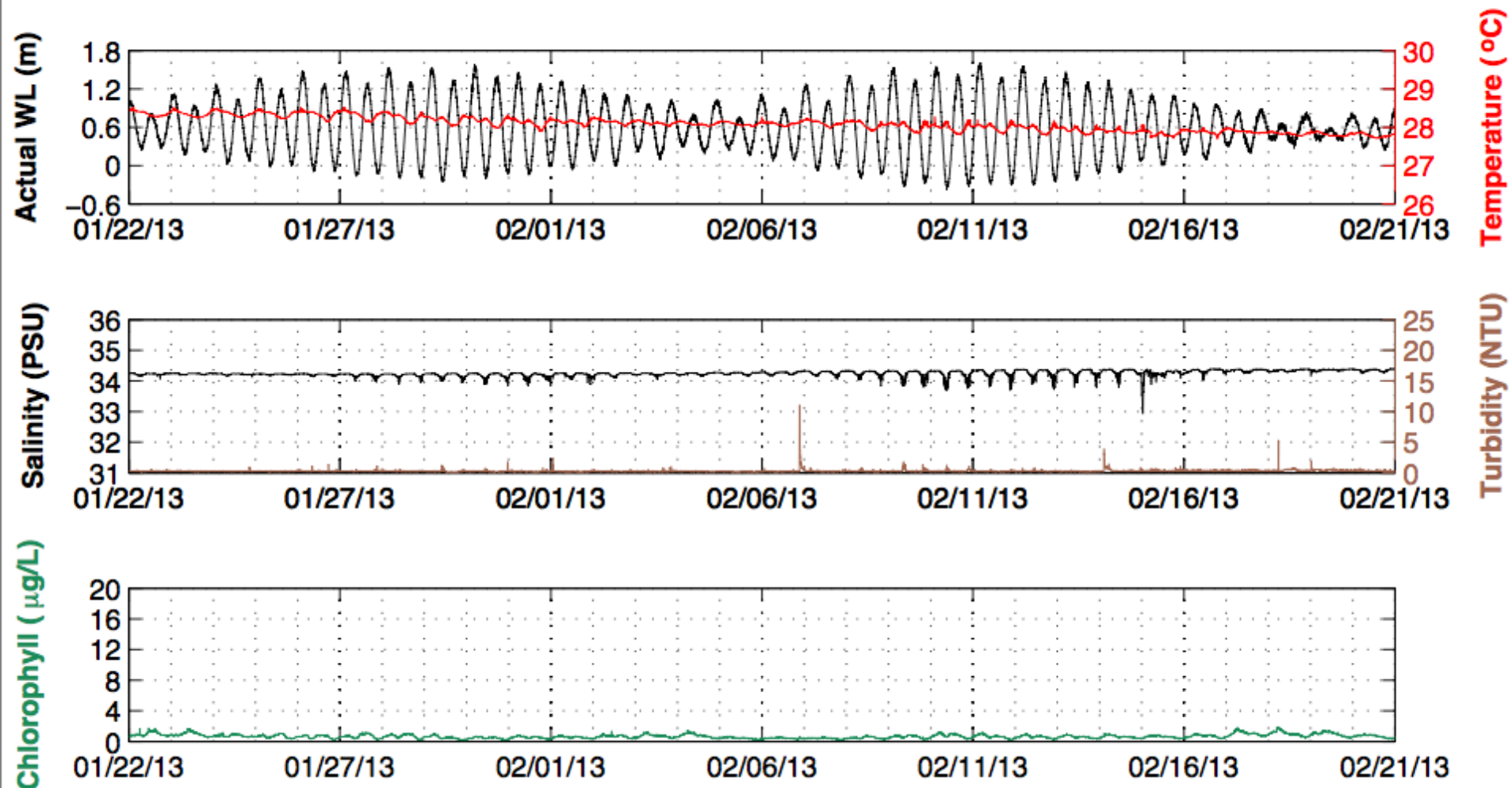
### Select Time Range:

Latest



## Nearshore sensor, Majuro Atoll, RMI (NS07)

Feb 2013





*Mahalo*

[www.pacioos.org](http://www.pacioos.org)

