

Julianna Thomas

- “Smart” Monitoring to Help Protect Vulnerable Coastal Communities
- Thursday, 6/8 from 8:30 – 9:45

Smart Monitoring to help Protect Vulnerable Coastal Communities



The Marine Room – Jan 1983

Julie Thomas

Program Manager - Coastal Data Information Program (CDIP)

Executive Director - Southern California Coastal Ocean Observing System (SCCOOS)

California Adaptation Forum

Long Beach, California

September 8, 2016

An aerial photograph of a coastal area. In the upper half, there are several large, multi-story buildings with flat roofs, some showing signs of wear or damage. Below the buildings, the terrain is rocky and uneven, leading down to a shoreline. The water is visible in the bottom left corner. A blue semi-transparent box is overlaid on the top half of the image, containing the title text. Another blue semi-transparent box is overlaid on the bottom half, containing a list of points.

Outline

Vulnerabilities & Smart Monitoring

1. Programs that promote smart **monitoring**:

- CDIP
- SCCOOS

2. Example of a **vulnerable** community showing coastal impacts (beaches, flooding, shoreline health)

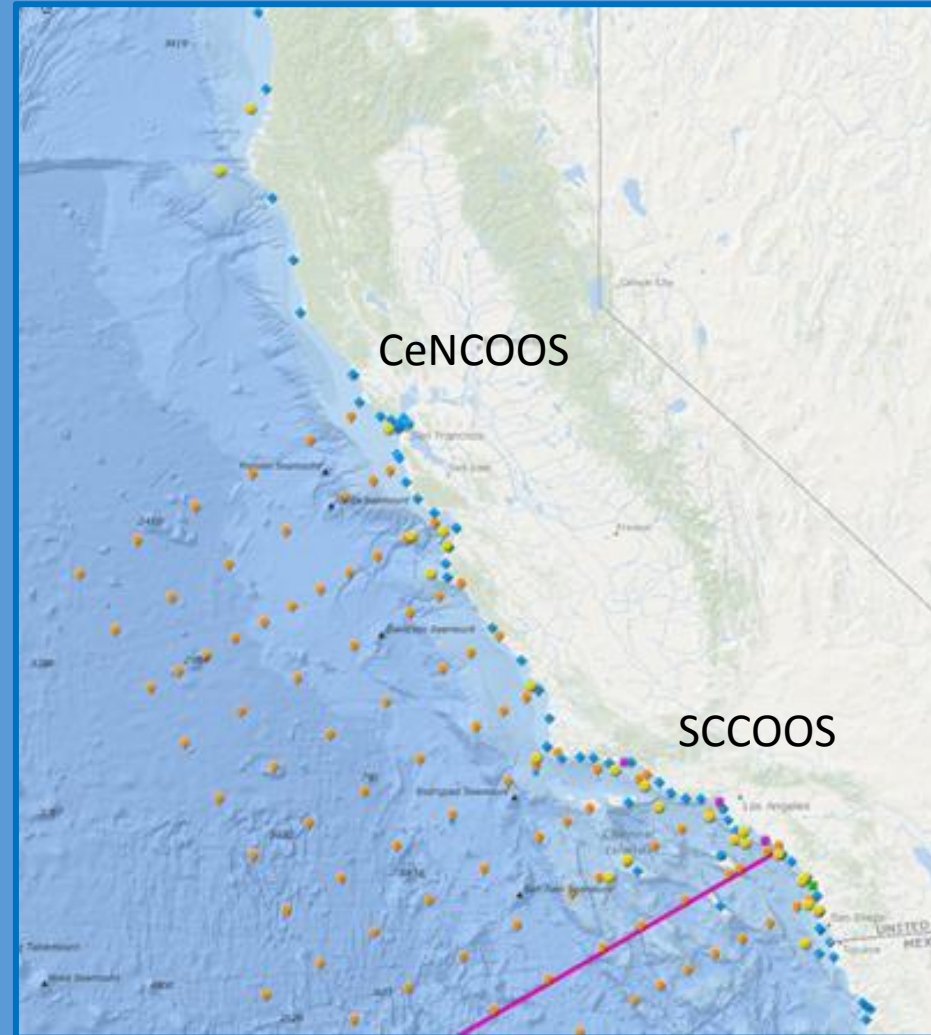
Smart Monitoring Observational Programs

Coastal Data Information Program (CDIP)



cdip.ucsd.edu

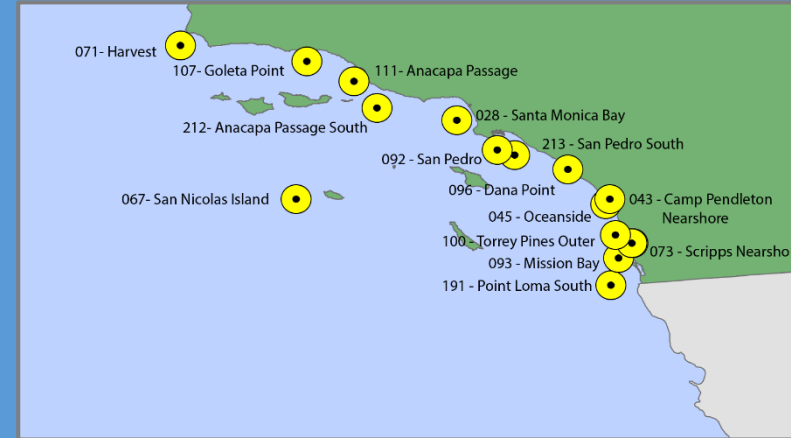
California Ocean Observing Systems



cencos.org

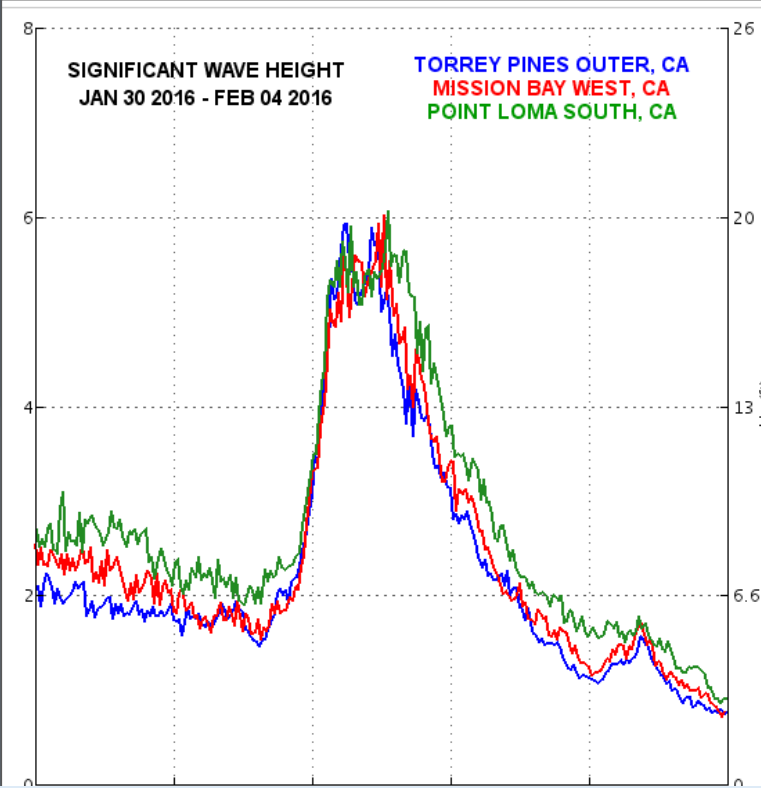
sccoos.org

CDIP WAVES Observations

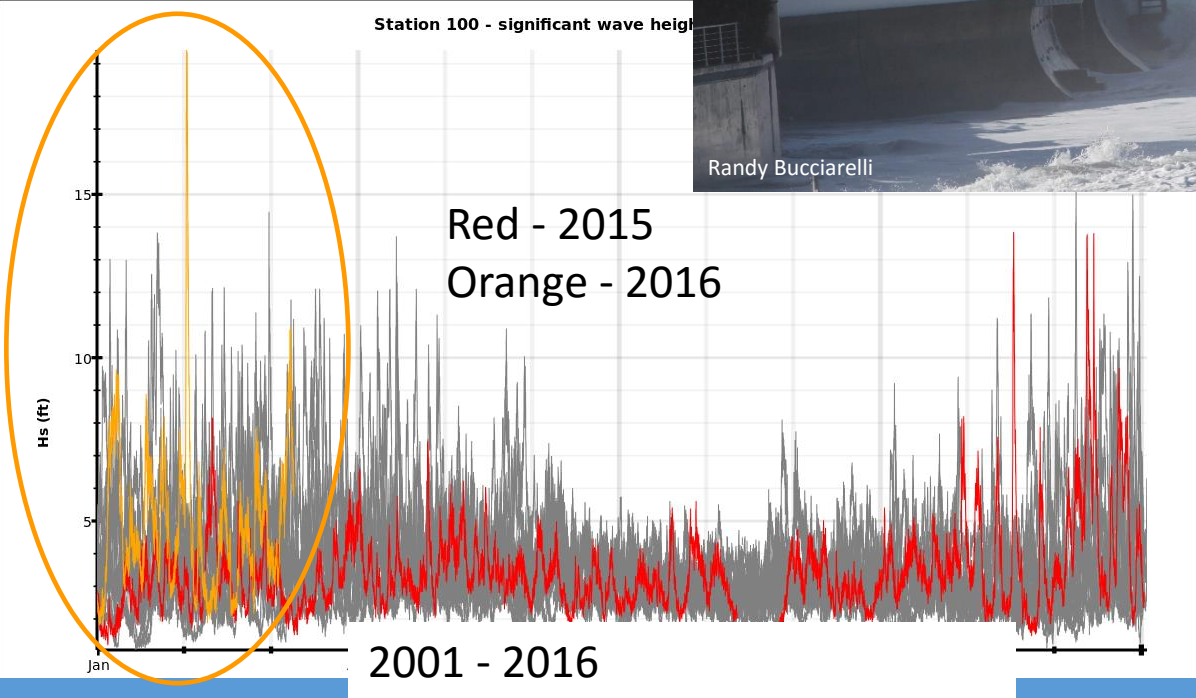


Station	Date	Max Wave (ft)	Period (sec)
Torrey Pines	2016-02-01	32.57	9.4
Point Loma South	2016-02-01	32.57	9.4
Scripps Pier	2016-02-01	12.56	10.0
Mission Bay	2016-02-01	29.06	7.8

CDIP WAVE Observations



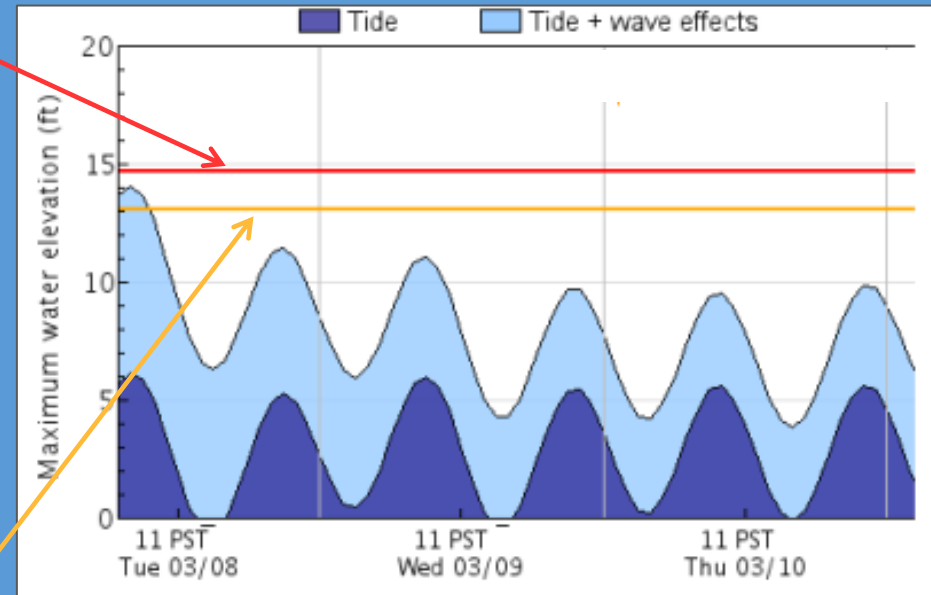
February 1, 2016
20ft waves are the highest measured since 2001



CDIP Flood Index Model - Cardiff

Automated messaging to the NWS office, City of Encinitas, CA State Parks, Beach Restaurants when thresholds are met.

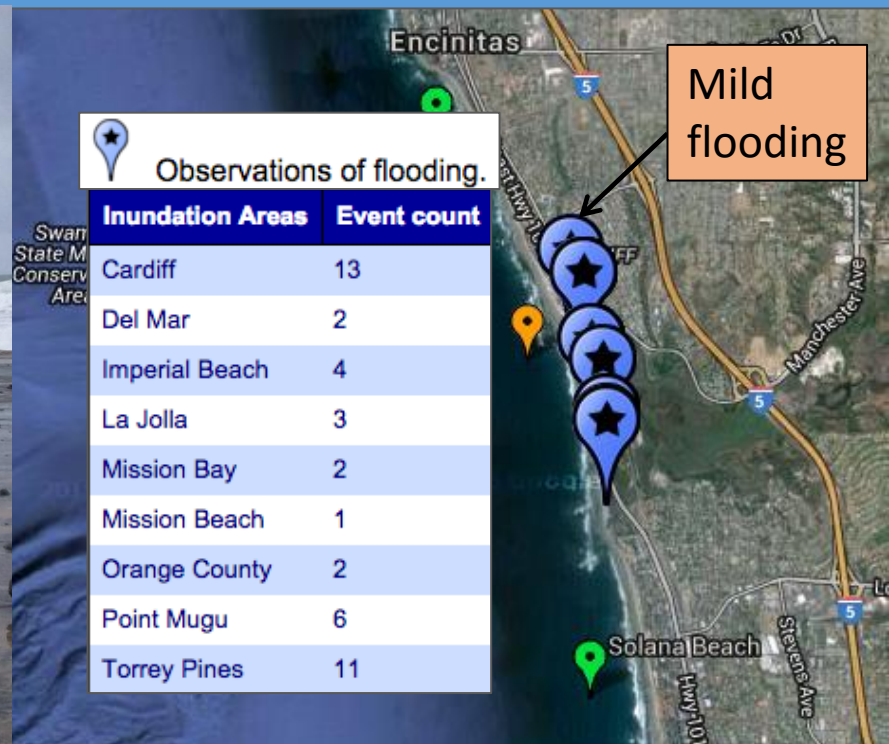
Moderate threshold Hwy 101 overtops



Mild threshold – Cardiff Seaside floods
<http://sccoos.org/data/flooding-storm-surge-models/>

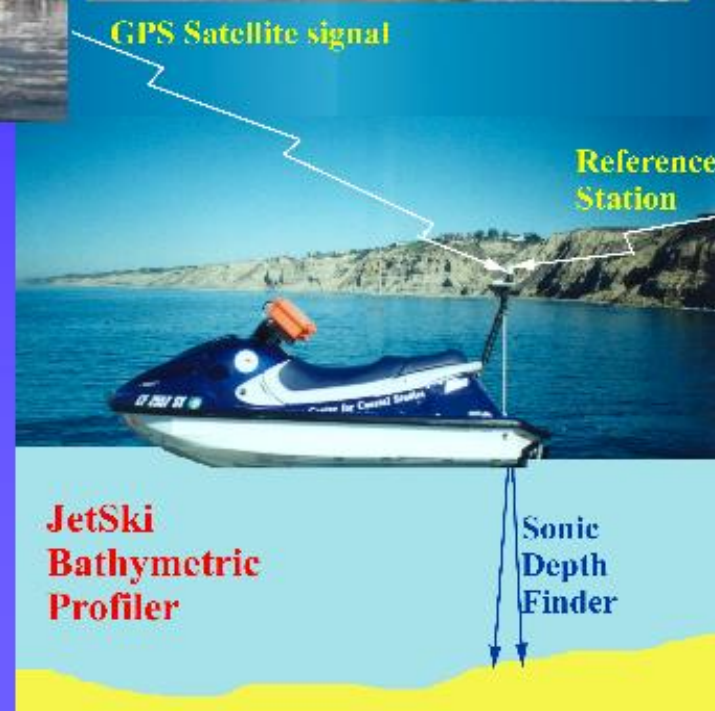


CDIP Historical Flood Event Catalog



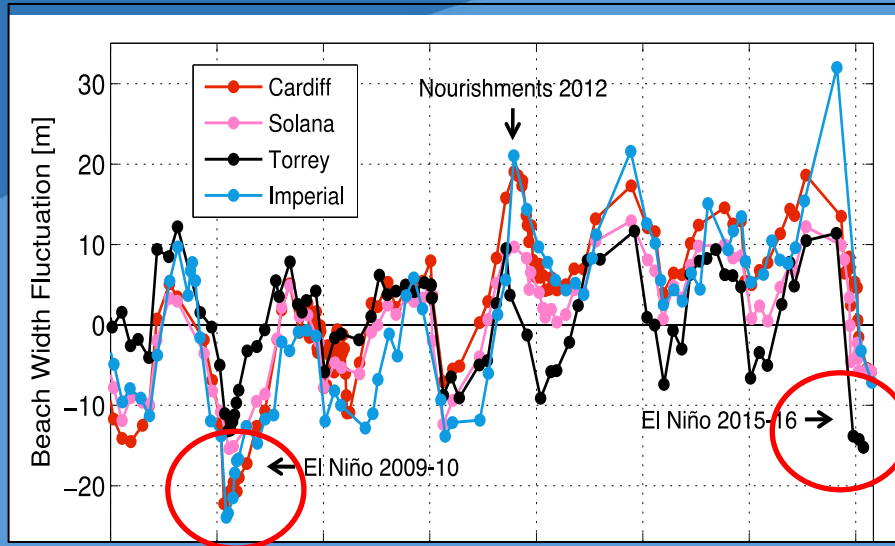
Id	Obs date (PST)	Lat (N)	Lon (W)	Region	Location	Observer	Flooding date (PST)	MoP Id	Hs (ft)	Tp (s)	Dp (deg)	Tide (ft)
7	2007-12-05 12:35	33 0.160'	117 16.690'	Cardiff	Seaside parking lot looking south	Andrew Gale	2007-12-05 05:00	D0668	7.02	16.67	260	5.15
27	2010-01-20 11:15	33 0.117'	117 16.688'	Cardiff	Cardiff State Beach	Katherine Weldon	2010-01-20 10:00	D0667	8.60	13.33	268	3.64
28	2010-01-21 08:30	33 0.885'	117 16.890'	Cardiff	Cardiff State Beach	Katherine Weldon	2010-01-21 00:00	D0682	7.58	14.29	263	4.23
31	2010-01-27 00:00	33 0.776'	117 16.815'	Cardiff	Cardiff State Beach	Katherine Weldon	2010-01-27 06:00	D0680	3.22	11.76	262	6.20
32	2010-01-28 08:30	33 0.776'	117 16.815'	Cardiff	Cardiff State Beach	Katherine Weldon	2010-01-28 07:00	D0680	3.05	12.50	260	6.59
33	2010-01-29 08:45	33 0.776'	117 16.815'	Cardiff	Cardiff State Beach	Katherine Weldon	2010-01-29 08:00	D0680	2.79	11.76	263	6.79
34	2010-01-30 09:00	33 0.776'	117 16.815'	Cardiff	Cardiff State Beach	JP St Pierre	2010-01-30 09:00	D0680	4.27	14.29	262	6.66
37	2010-02-27 08:00	33 0.478'	117 16.776'	Cardiff	Cardiff Beach	Katherine Weldon	2010-02-26 20:00	D0674	3.08	12.50	263	4.40
38	2010-02-28 11:00	33 0.478'	117 16.776'	Cardiff	Cardiff Beach	Katherine Weldon	2010-02-28 08:00	D0674	9.74	15.38	267	6.04

Beach Sand Levels

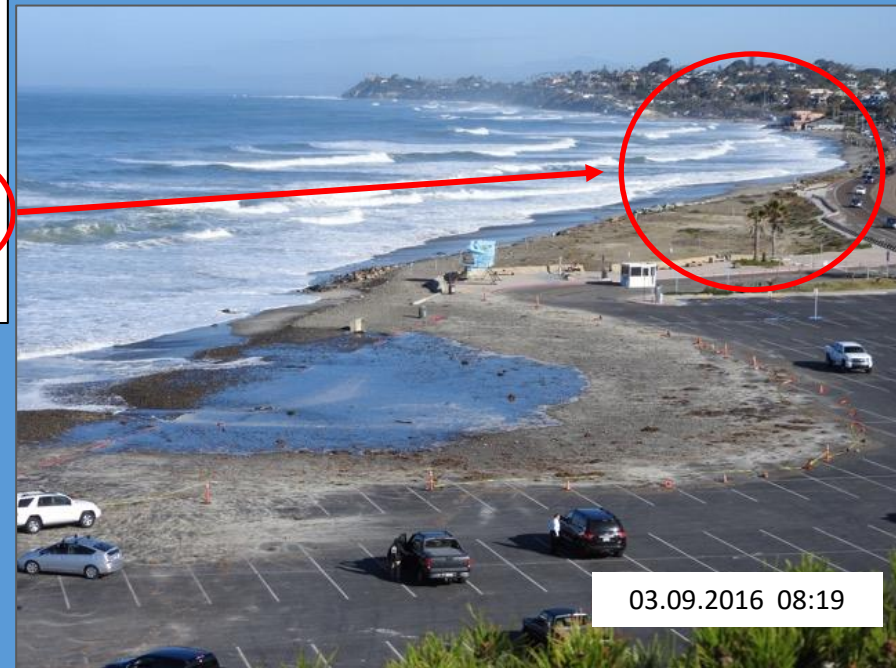


**In situ Survey
Instrumentation**

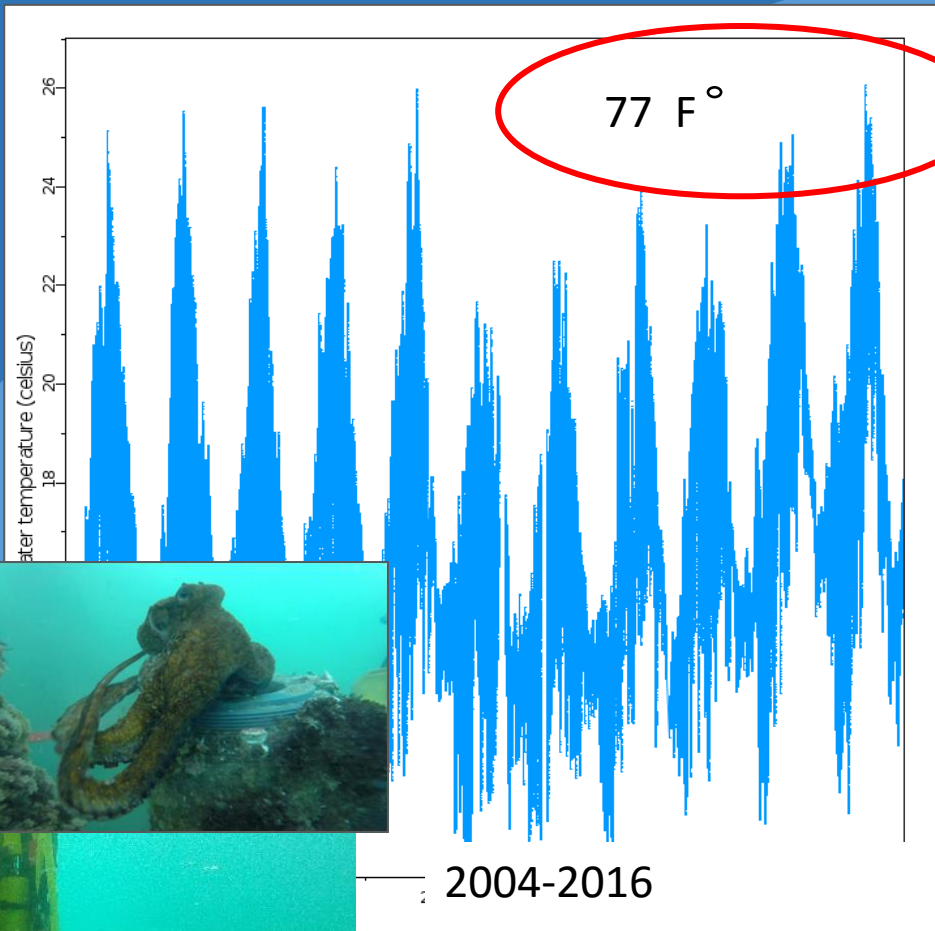
Beach Monitoring



Beach width fluctuation (about the mean) versus time for San Diego county beaches. Beaches are wider in summer than winter. El Niños caused relatively strong shoreline erosion, and 2012 nourishments widened Imperial, Cardiff, and Solana.



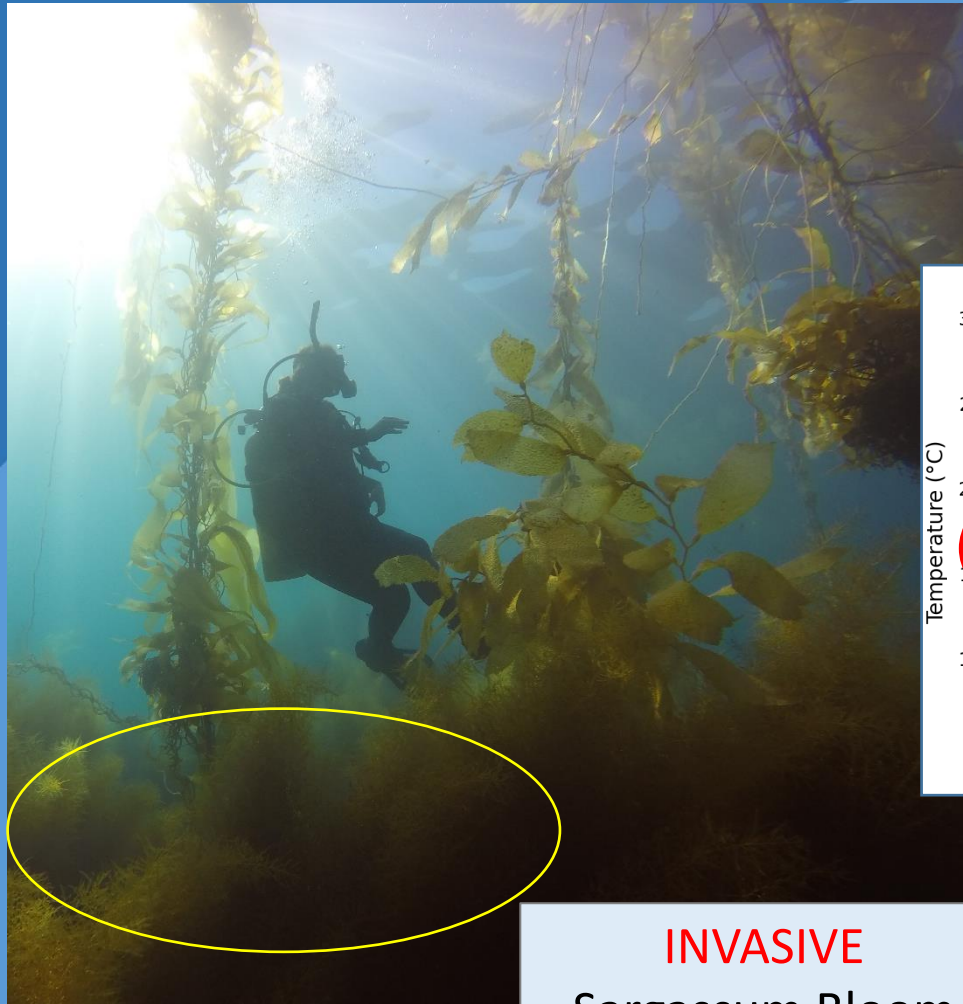
Offshore Ecosystems - Sea Surface Temperature



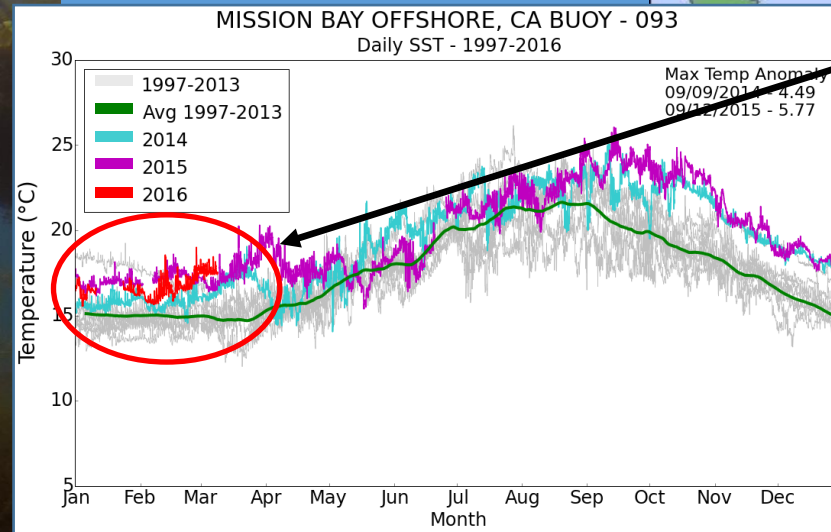
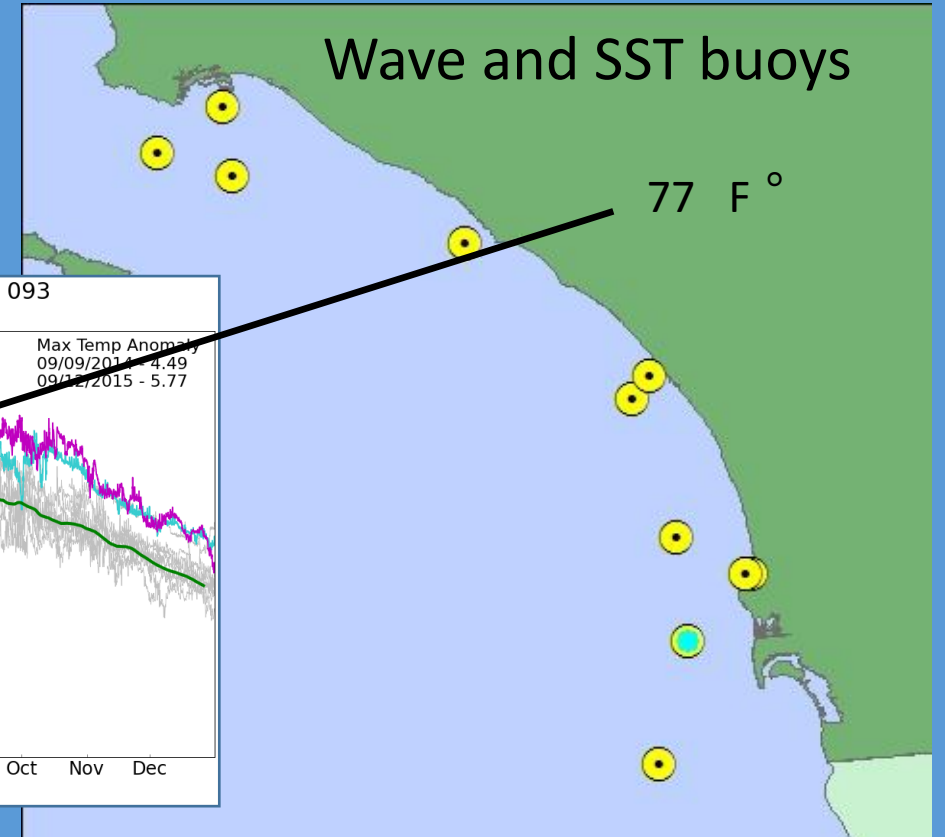
Scripps Pier Shore Station (Automated)



Offshore Ecosystems - Sea Surface Temperature (SST)



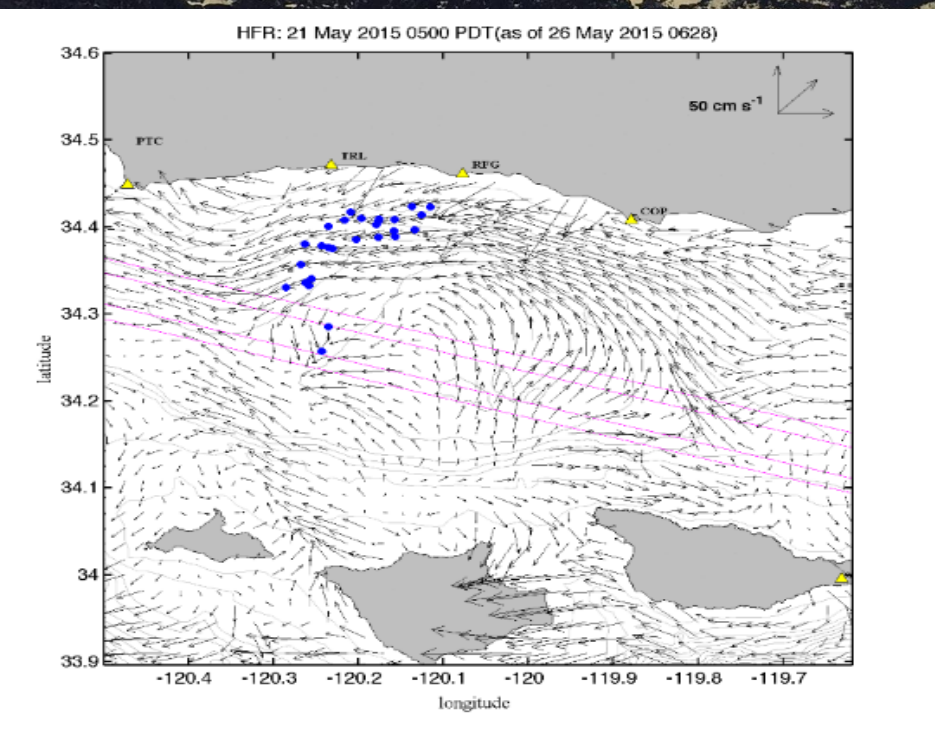
INVASIVE
Sargassum Bloom
"Devils Weed"



This El Nino will eradicate most of the kelp from storm waves and warm temperatures/low nutrients. I'm genuinely concerned that it will change the nature of our kelp forests forever. ~ Dr. Ed Parnell

Oil Spill Response

High Frequency Radar- Ocean Surface Currents



Refugio Beach, Santa Barbara



SUMMARY

Value of “smart” monitoring:

- Sustainability of observations
 - Validation of models
 - Need the baseline to detect “events” and monitor climate trends
- Interoperability of data (common formats, standards and quality control)
- Integration of data – Complete picture!

Solimar Beach, Ventura Co. (1997/98 El Niño)



Alan Hagman / Los Angeles Times
<http://www.latimes.com/local/lanow/la-me-ln-huge-el-nino-could-devastate-southern-california-20150813-story.html>