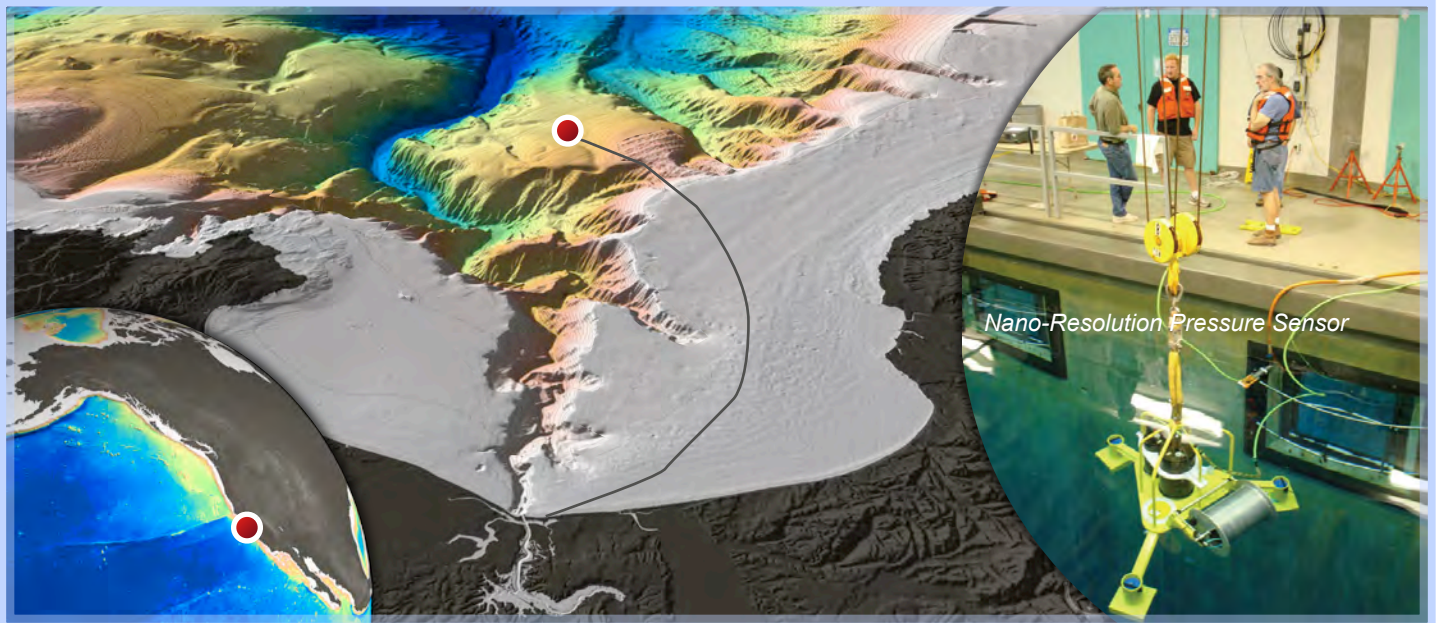
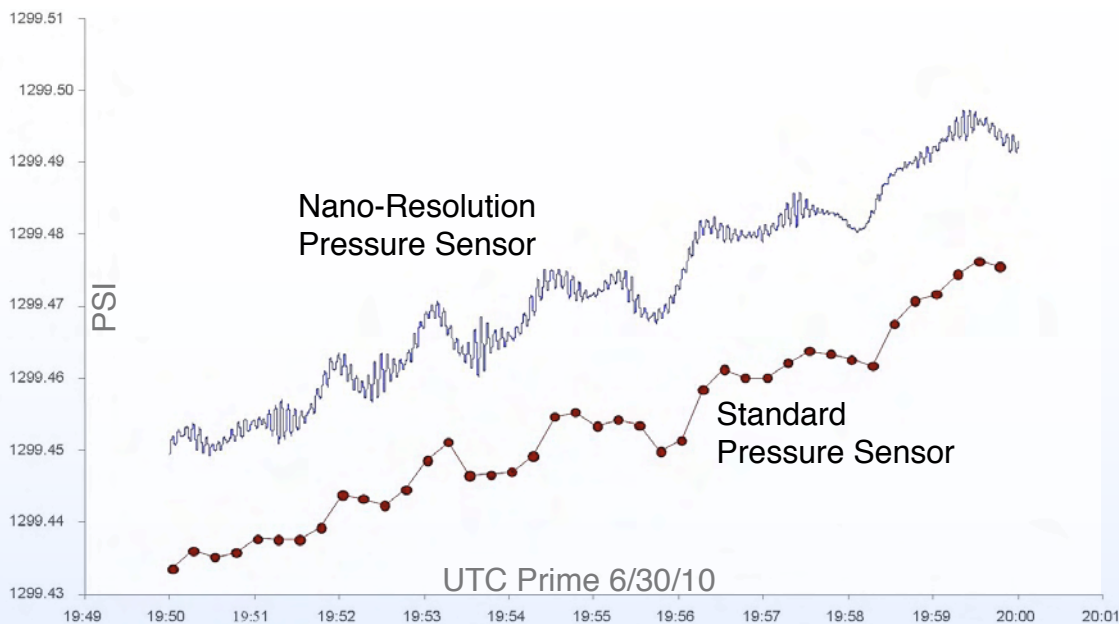


# Breakthrough Technology for Early Tsunami Warnings: Nano-Resolution Pressure Sensor

Deployed on the MARS Ocean Observatory



On June 30, 2010 scientists installed a Nano-Resolution Pressure Sensor side-by-side with a standard tsunami pressure sensor on the Monterey Accelerated Research System (MARS) cabled observatory in Monterey, California.



Plot shows increasing pressure from an incoming tide, microseismic seafloor accelerations equivalent to 1 mm pressure variations, and longer-period infragravity waves.

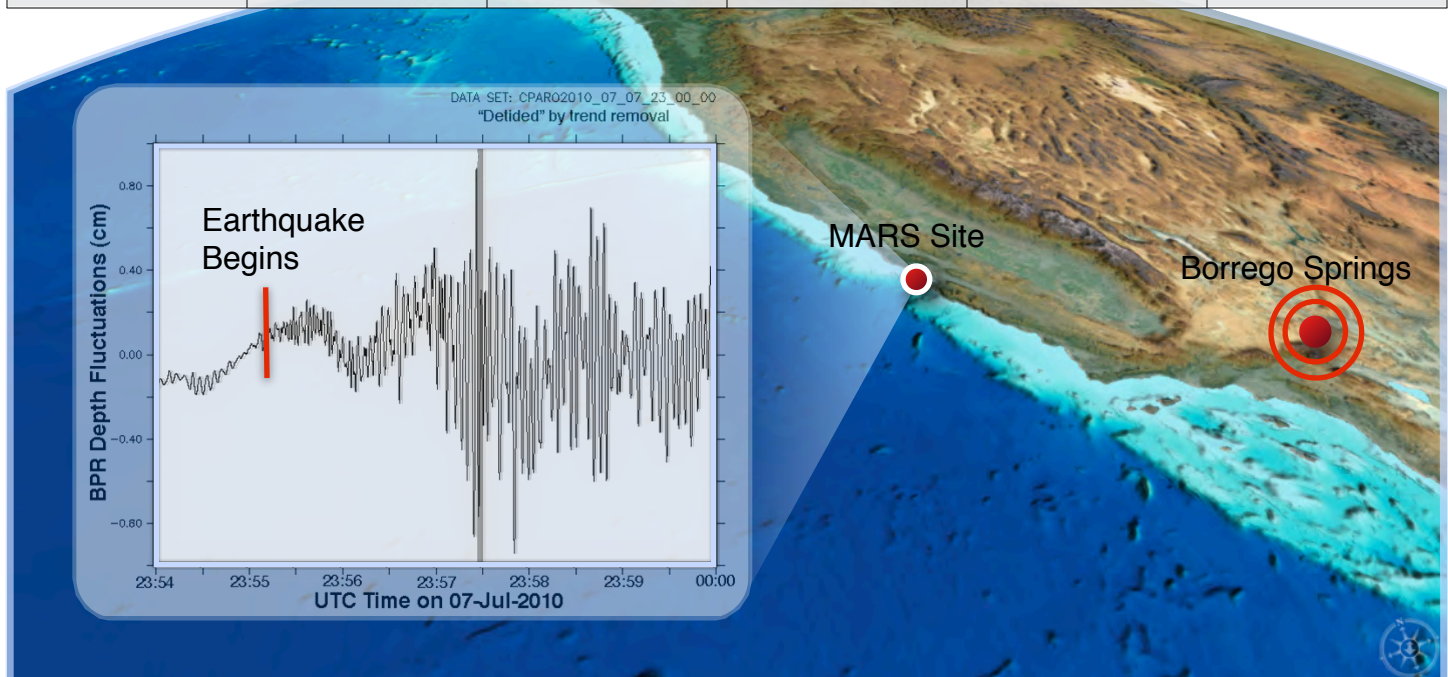
A partnership among:



**Proof of Concept...** During the first 2 weeks of testing, the Nano-Resolution Pressure Sensor measured ocean signals with unprecedented clarity, including the detection of 4 earthquakes.

*Earthquakes recorded during July 2010:*

Date	Time	Magnitude	Depth (km)	Latitude (deg)	Longitude (deg)
7/7/2010	23:53:33	5.5	14	33.42N	116.48W
7/10/2010	11:43:32	6.3	13	11.14N	145.98E
7/12/2010	00:11:21	6.3	120	22.12S	68.19W
7/18/2010	5:56:44	6.6	10	52.86N	169.84W



The nano-resolution pressure sensor offers a state-of-the art ability to separate earthquake vibrations from tsunami waveforms, paving the way for accurate, early tsunami warning systems to:

- Measure tsunamis as small as 1 millimeter
- Detect seismic waves from across the ocean
- Monitor submarine volcanoes in real time
- Improve the signal-to-noise ratio of co-located ocean bottom seismometers

Data from the sensor may be viewed at: [www.pmel.noaa.gov/vents/geology/mars/](http://www.pmel.noaa.gov/vents/geology/mars/)

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