Seismic + Oceanic Sensors (SOS)

- Absolute Pressure Gauges
- Triaxial Accelerometers
- Nano-Resolution Electronics
- In-situ Calibration Methods to Eliminate Quartz Sensor Drift

→ Earthquake & Tsunami Warnings

→ Geodetic Measurements of Earth Movements (Depth & Tilt)

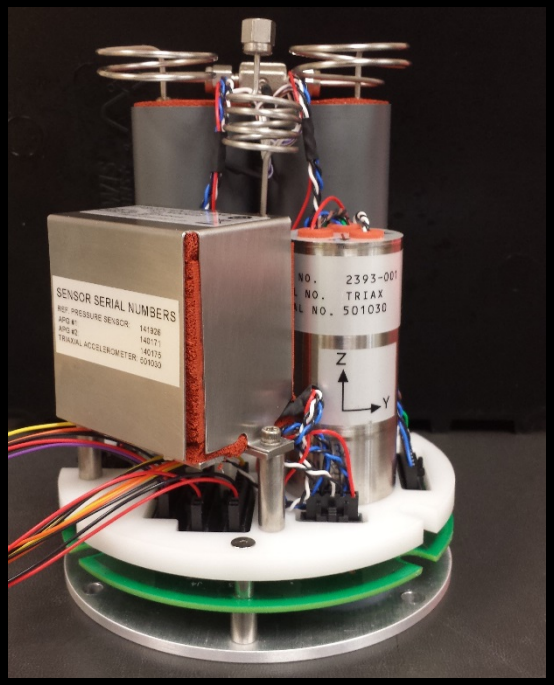
→ Climate Change (Sea Level Changes)

→ Energy Exploration & Production

Measurement Platforms

- Cabled Systems
- Ocean Bottom Recorders
- Borehole Installations on Land and Sea
- Inverted Echo Sounders and Underwater Vehicles

Disaster Warning & Geodesy System



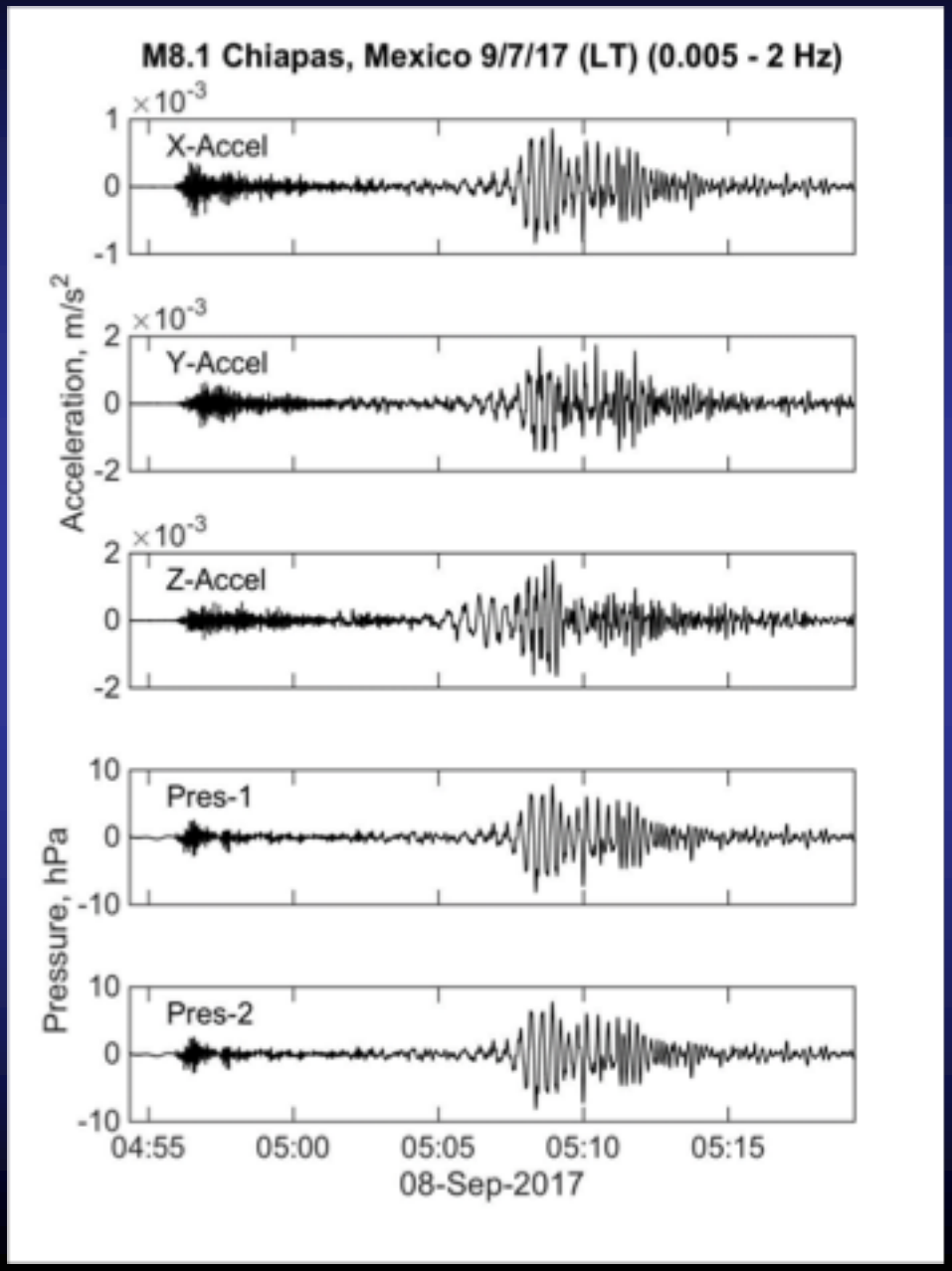
UW Cabled System & LDEO Bottom Recorder Seismic + Oceanic Sensors (SOS) Module

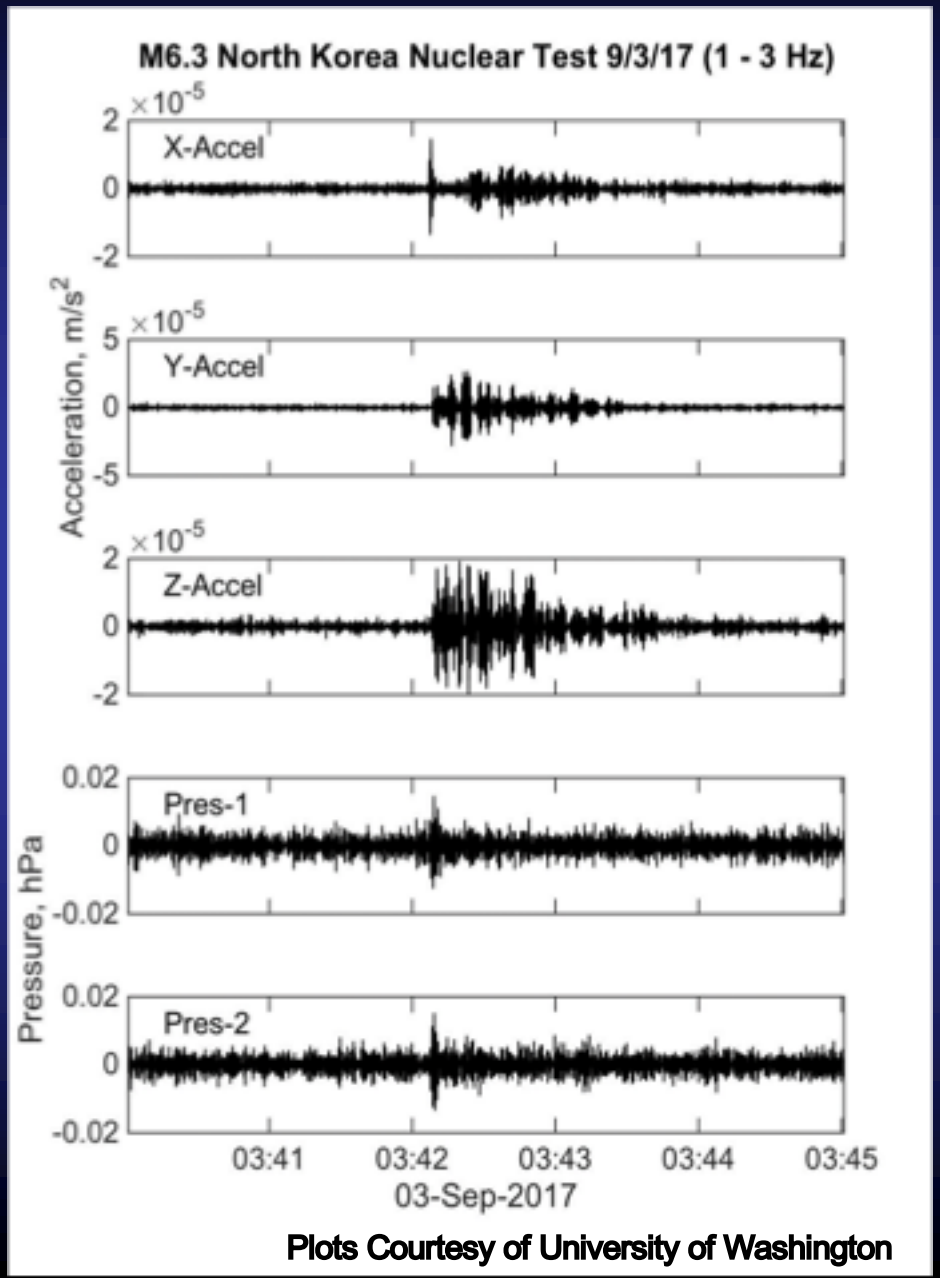
- 2 Digiquartz® Absolute Pressure Gauges (APGs)
- 1 Triaxial Accelerometer
- 1 Digiquartz® Barometer
- 3 Nano-resolution Processing Electronics
- In-situ A-0-A Calibration Method to Eliminate Drift

Temperature-compensated & Linearized RS-232 Outputs

- Seawater Pressures (A) and Temperatures from each APG
- X-Y-Z plus total Vector Accelerations and Accelerometer Temperature
- Interior Housing Barometric Pressures (0) and Barometer Temperature
- All sensors can be synchronized and time-stamped using PPS inputs

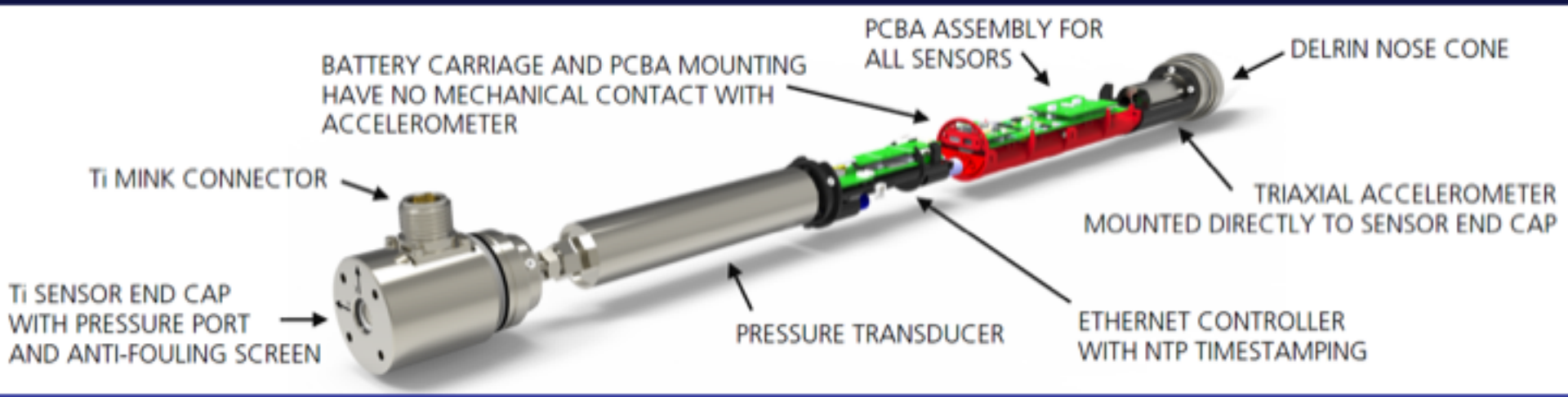
Co-located Seismic – Pressure - Geodesy Measurements

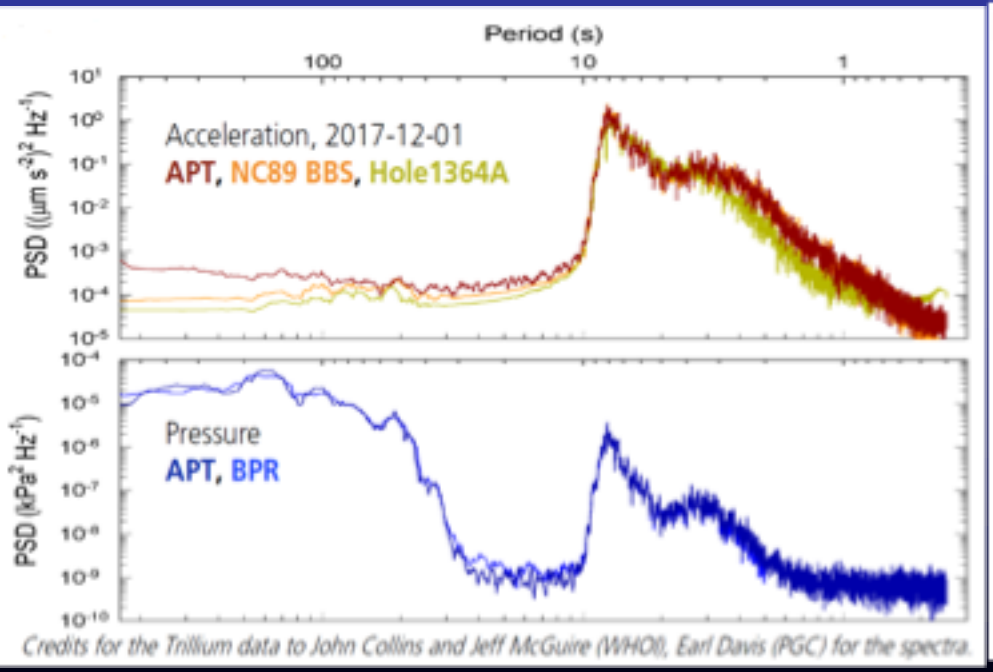


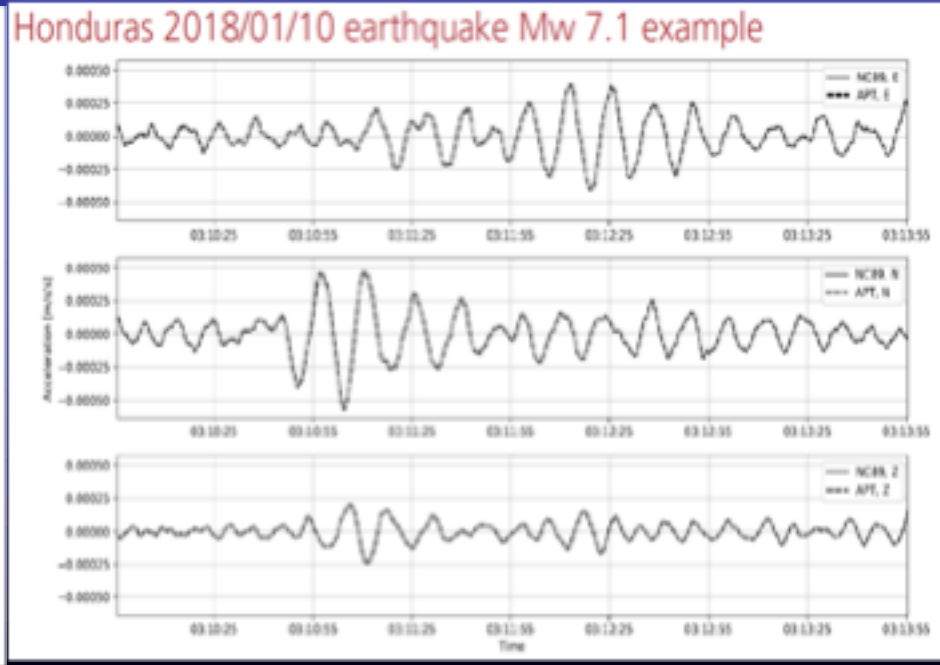


Plots Courtesy of University of Washington

Combined High-Resolution Triaxial Accelerometer and Bottom Pressure Recorder for Early Earthquake and Tsunami Warning Detection



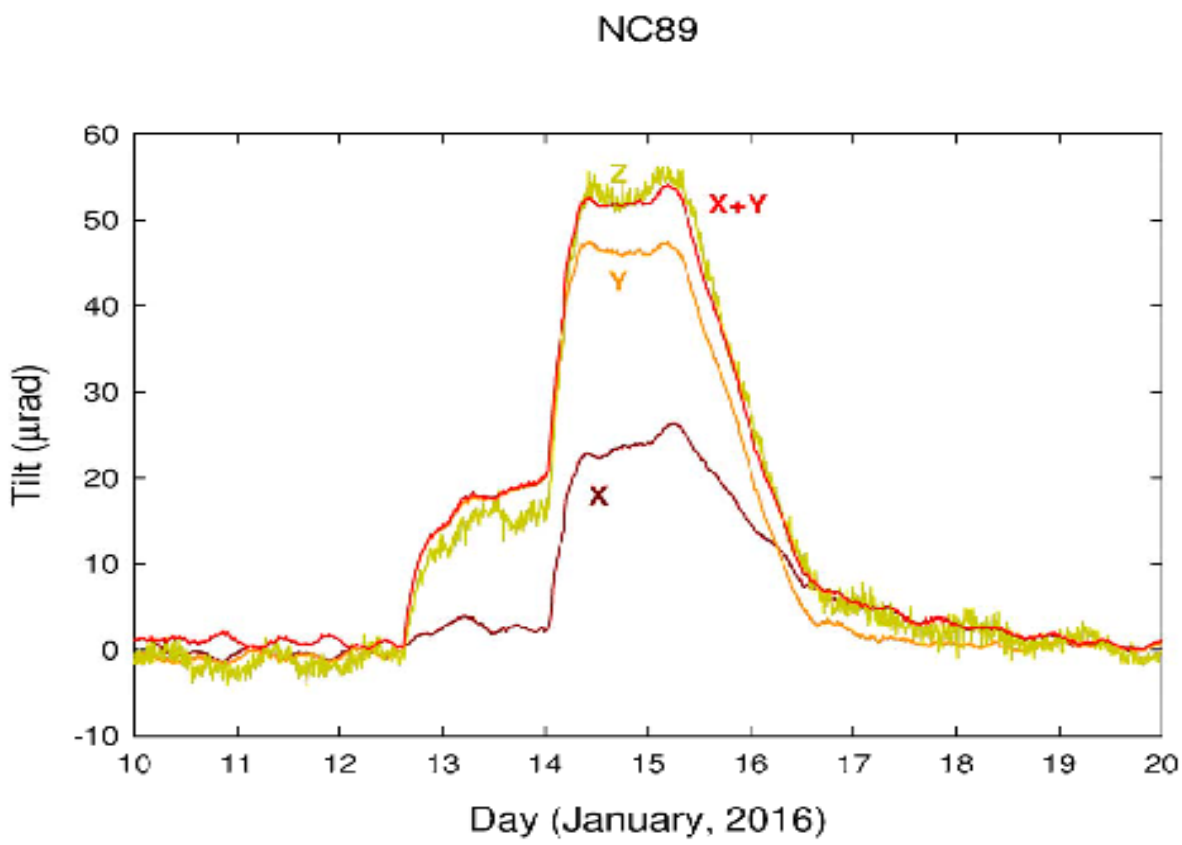




Courtesy of RBR

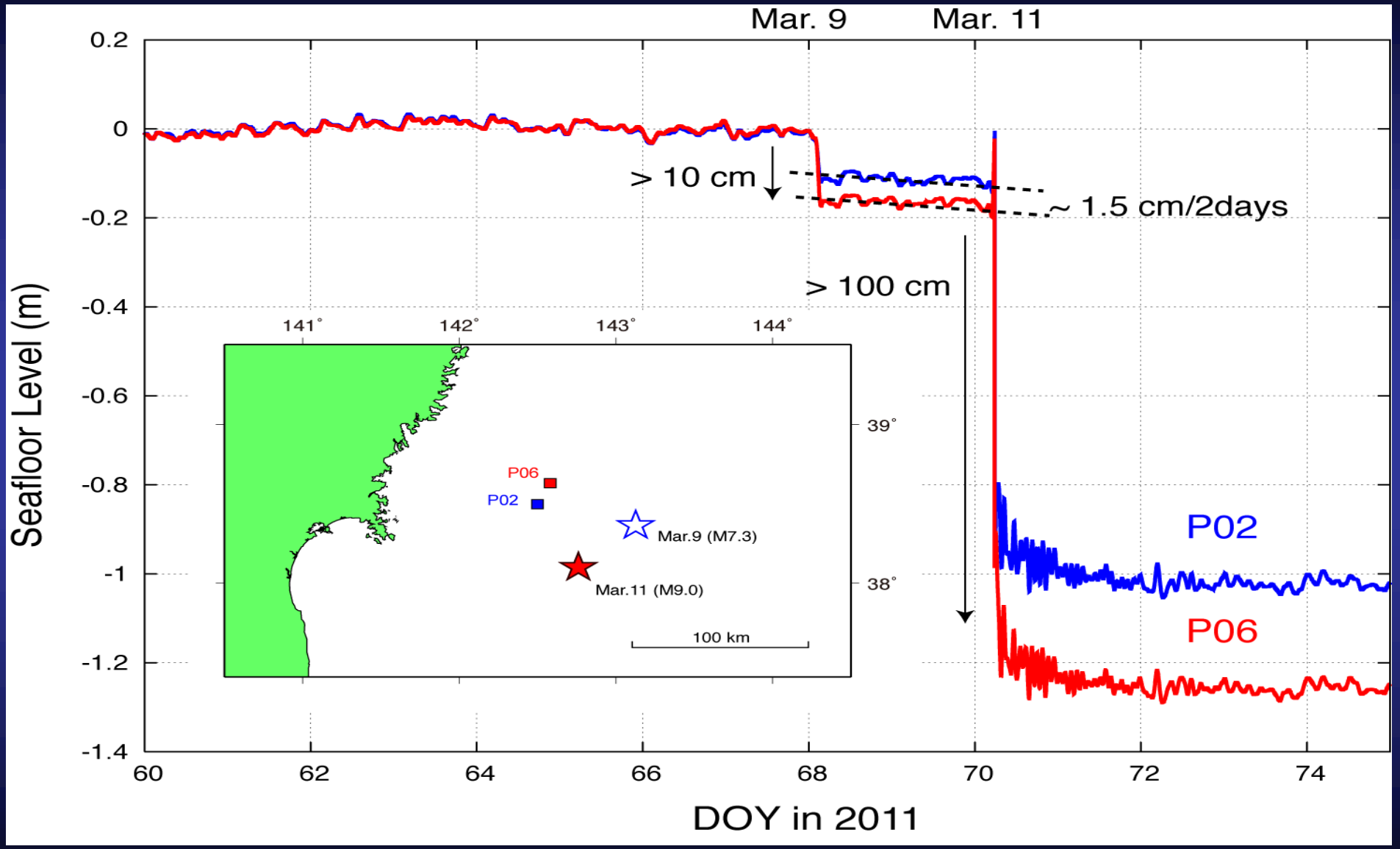
Tilt Measurements Using 3G Range Quartz Triaxial Accelerometer with Internal Alignment Matrix

Longer-term geodynamic signal (at time of nearby gas venting activity)



Plot Courtesy of Dr. Earl Davis

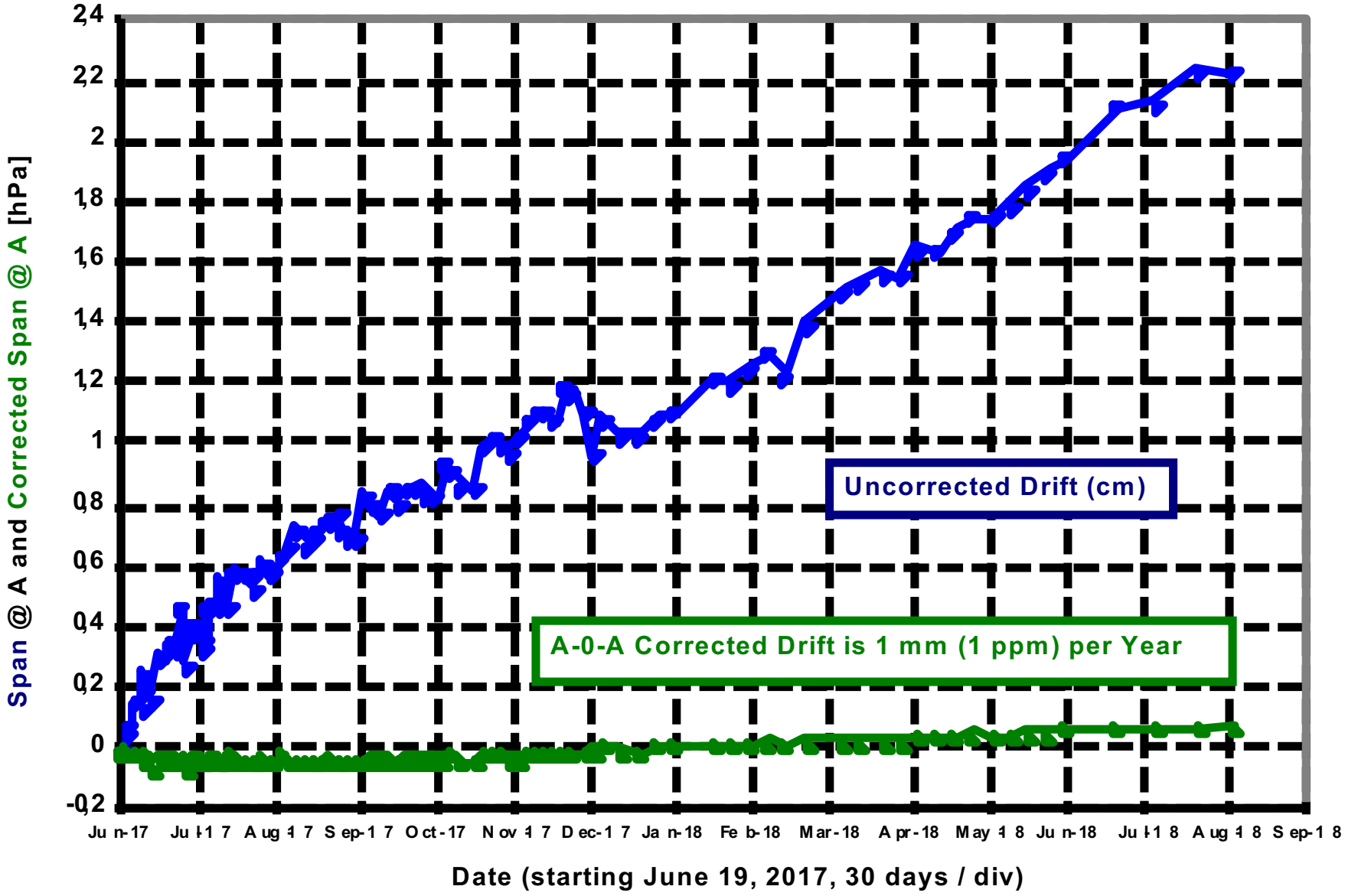
3-9 Precursor to 3-11 Tsunami



Plot courtesy of Dr. Ryota Hino

Elimination of Quartz Sensor Drift with A-0-A

Span @ A and Span @ A Corrected for Offset (0) Drift



Seismic + Oceanic Sensors (SOS) provide:

- Improved warning times for earthquakes & tsunamis
- Improved geodetic measurements for scientific research and predictions of natural disasters
- Improved Measurements for Energy Exploration & Production
- Low-cost measurement solutions for new and existing cabled, remote, and mobile platforms