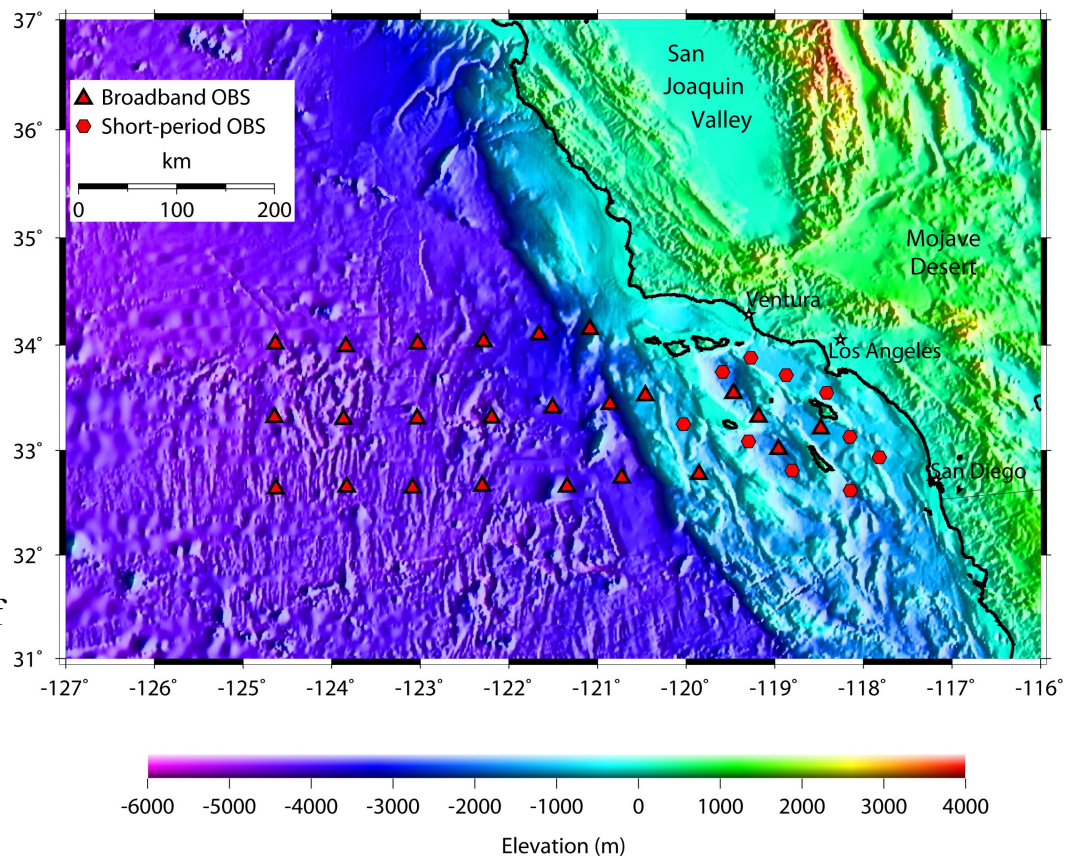


OBSIP Experiment Archive

Year:	2010
Experiment Name:	Asthenospheric and Lithospheric Broadband Architecture from the California Offshore Region Experiment (ALBACORE)
Principal Investigator(s):	Monica Kohler (Caltech)

Experiment Summary: (Taken from NSF Abstract Award #[0825254](#)): The Pacific-North America plate boundary in southern California is one of the only examples of recorded subduction of an oceanic spreading center in geological history, but this process is likely to be a common component of Earth history. Almost half of the Pacific-North America plate boundary in southern California lies offshore, but little is known about the physical properties of the oceanic plate, its mode of deformation, or its influence on western North America. This project will deploy 24 long-duration, broadband Ocean Bottom Seismometers (OBS) in a passive seismic experiment off the coast of southern California that spans the oceanic half of the Pacific-North America plate boundary. The OBS data will be combined with same-event data recorded on the permanent California Integrated Seismic Network for coverage across the onshore basins, San Andreas fault, and into the North America plate. The objective is to understand the tectonic interaction at this boundary by identifying the physical properties and deformation styles of the Pacific plate and near-shore microplates, as well as distinguish

among contrasting upper mantle geodynamic scenarios which predict large-scale mantle flow patterns beneath western North America. The seismic studies aim to characterize the driving plate motion consequences of collision between the rift system, a fragmented subducted plate, the lengthening of the San Andreas transform fault system, and block rotations.



Continued Next Page

OBSIP Experiment Archive

...Continued

Year:	2010
Experiment Name:	Asthenospheric and Lithospheric Broadband Architecture from the California Offshore Region Experiment (ALBACORE)
Principal Investigator(s):	Monica Kohler (Caltech)

Experiment Summary: ...Of particular relevance is understanding the source of the forces and rheology that affect the stress state of the elastic crust to generate earthquakes. The boundaries for the seismic array overlap the region of complex breakup and fracture of the Pacific plate near-shore where several microplates are observed, and extends far to the west to provide comparison with oceanic lithosphere that is not fractured and has formed at a uniform

Cruises:

8/14/2010 - 8/27/2010:

24 SIO broadband and 10 short period ocean bottom seismographs were deployed on board the R/V Melville.

9/7/2011 - 9/16/2011:

22 SIO broadband and 10 short period ocean bottom seismographs were recovered on the R/V New Horizon, 1 OBS was unresponsive and 1 did not rise from the sea floor.

Data:

Data from all instruments deployed are archived under temporary network code [2D](#) at the IRIS DMC.

Downloads/Links:

[ALBACORE Website](#)

[JGR Publication](#)

[Cruise Report - Deploy](#)

[Cruise Report—Recovery](#)

rate. The results will aid in understanding the boundary forces due to relative plate motions, the driving forces and characteristics of oceanic and continental scale deformation, and how the continental margin accretionary process is influenced by offshore tectonics. An additional goal is to examine the local earthquake data and their focal mechanisms for seismicity patterns. The local seismicity recorded by the proposed OBS network is expected to produce a more accurate offshore hypocenter catalog that can be used to identify spatial relationships between background seismic activity with mapped offshore faults.