

## The crustal and upper mantle structure of the Hawaiian-Emperor Seamount Chain from marine seismic data

\*Brian Boston<sup>1</sup>, Philip Cilli<sup>2</sup>, Robert Dunn<sup>3</sup>, Donna J. Shillington<sup>4</sup>, Anthony B. Watts<sup>2</sup>, Ingo Grevemeyer<sup>5</sup>, Laura Gómez de la Peña<sup>5</sup>, Garrett Ito<sup>3</sup>, Paul Wessel<sup>3</sup>, Uri ten Brink<sup>6</sup>, Nathan Miller<sup>6</sup>

1. Lamont-Doherty Earth Observatory, 2. University of Oxford, 3. University of Hawaii at Manoa, 4. Northern Arizona University, 5. GEOMAR, 6. USGS

The northeast Hawaiian Arch is one of the site locations considered for scientific drilling of Cretaceous oceanic crust and Moho. We used R/V *Marcus G. Langseth* to acquire deep-penetration, multichannel seismic reflection data and wide-angle seismic data across and along the Hawaiian Island Chain to examine the crustal structure resulting from recent (>5 Ma) volcano construction and the structure of the Cretaceous oceanic lithosphere on which the volcanic chain was built. For acquisition of the seismic reflection data, we used a nominal 6600-cu-in tuned air gun array and a 15-km-long hydrophone streamer cable. For wide-angle seismic data, we used the same source with ocean-bottom seismometers spaced at ~15 km. Additionally, legacy data from common depth point and constant offset profile data acquired on R/V *Robert D. Conrad* and R/V *Kana Keoki* during August-September 1982 have been reprocessed from the original field data. The reprocessed profiles show significant improvement in image quality allowing for additional constraints on the Moho and deformation from volcanic loading of the plate. Analyses of the data have allowed imaging of the contact between the pre-existing oceanic crust and the volcanic seamounts, the structure of the surrounding Pacific Plate, and the effects of volcanic loading on the oceanic plate.

Keywords: Hawaii, Ocean Drilling, Seismic Data