**Award Abstract #0451790**

# Collaborative Research: A 3-D Seismic Investigation of the Nankai Trough Plate Boundary System in the Kumano Basin

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| **Investigator(s):** | Gregory Moore gmoore@Hawaii.edu(Principal Investigator) |
| **Sponsor:** | University of Hawaii<br>2530 Dole Street<br>Honolulu, HI 96822 808/956-7800 |
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## ABSTRACT

Abstract The PI team will acquire, process, and interpret a high-quality 3-D seismic reflection data volume in the Kumano Basin region south of Kii Peninsula, Japan. The 3D seismic survey will be carried out in April 2006 by PGS ship R/V Ramform Victory (Norwegian registry), jointly supported by the NSF and JAMSTEC. These data will define the fundamental geometry, history and physical properties of the multiple faults that compose the up-dip end of the seismogenic zone,

many of which ruptured in the 1944 M 8.1 Tonankai earthquake. The proposed work is a major component of the integrated Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE), including the recently highly ranked shallow non-riser drilling and the deep riser drilling planned through the Integrated Ocean Drilling Program (IODP). With ground-truth from drilling and associated borehole geophysical experiments, this 3D seismic volume will provide unprecedented illumination of a plate boundary fault system to visualize its geometry, history, and associated rock properties, as it evolves down dip into a seismogenic zone. Furthermore, 3D imaging and seismic attribute mapping are essential components for refining drill site locations and for detailed planning for drilling and casing operations in support of the most ambitious scientific ocean drilling operation ever conceived. This project is a collaborative effort among four U.S. and two Japanese institutions to contract a seismic company to collect and provide preliminary processing of an ~20x80 km 3-D seismic reflection grid, along a transect from the Kumano Basin to the frontal thrust of the Nankai accretionary prism. The study encompasses a number of broader impacts, including the societal benefit of better understanding the origin of dangerous subduction zone thrust earthquakes.



The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749

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