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# Press Releases

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JAMSTEC



## **Integrated Ocean Drilling Program (IODP) Deep-Sea Scientific Drilling Vessel *Chikyu* to Set Sail on Expedition 348 - NanTroSEIZE Stage 3: NanTroSEIZE plate boundary deep riser 3**

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The deep-sea drilling vessel *Chikyu*, operated by the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), will embark on her next mission, IODP ([\\*1](#)) Expedition 348: The Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) Stage 3 - from 13 September 2013 to 20 January 2014, in the northwestern Pacific Ocean.

### 1. Purpose

The Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) is a multiyear, multi-expedition science project, with IODP drilling designed to investigate the role of a megasplay fault on influencing plate boundary slip and subsequent tsunami generation, mechanisms of earthquake and tsunami generation along the Nankai Trough, and the mechanisms controlling the aseismic–seismic transition along the fault system by using boreholes to collect geological samples and conduct in situ measurements of geological properties and monitoring of crustal deformation.

### 2. Outline

The drilling project is comprised of four stages, with drilling operations planned at several sites along a line orthogonal to the Nankai Trough in the Kumano Basin, offshore of the Kii Peninsula (see [Figure 1](#)). This transect is within a 3D seismic volume providing high-resolution seismic images of the accretionary complex from the Kumano Basin to the Nankai Trough axis.

#### Stage 1 (Expeditions 314, 315, 316 [FY2007]): Completed

Operations for this Stage included drilling across the shallow part of the megasplay fault and plate boundary fault to clarify the properties of the fault that may have slipped during past earthquakes and to characterize subsurface distribution of strata, deformation structures, and the state of stress.

#### Stage 2 (Expeditions 319, 322 [FY2009], expeditions 332, 333 [FY 2010]): Completed

In Stage 2, the upper shallow portion of the seismogenic zone and incoming sediment that ultimately influences plate motion in the seismogenic zone were penetrated to decipher its geologic structure and to measure in situ formation

temperatures. Also, long-term borehole observatories were deployed to continuously monitor crustal deformation. These long-term observatories were connected to a subsea cabled monitoring network called Dense Ocean-floor Network for Earthquakes and Tsunamis ([\\*2](#) DONET) by the Research Vessel *Kaiyo* in January 2013.

Stage 3 (Expedition 326 [FY2010], Expedition 338, current expedition [FY 2013]). This Stage focuses on "ultra-deep" drilling to ultimately reach the seismogenic zone. Operations include direct core sampling and analysis from the fault on which great earthquakes have repeatedly occurred to understand the geologic characteristics of the seismogenic zone.

#### Stage 4 (FY2014 and beyond).

This Stage will include deploying long-term observatories in the ultra-deep borehole to monitor minor changes in the earthquake fault and its surrounding crust. Future goals include connecting these borehole sensors to DONET, so that real-time data from seismogenic zones can be made available.

### 3. Upcoming expedition 348

Riser drilling at Hole C0002F will obtain cuttings, mud-gas samples and data from logging while drilling up to about 3600 mbsf. The hole will be cased to preserve the borehole for a later expedition in 2015 to cross and sample the mega-splay fault.

### 4. Expedition 348 Science Party

#### Co-chief Scientists

- Takehiro Hirose, Sub leader, Kochi Institute for Core Sample Research, JAMSTEC, Japan
- Demian Saffer, Associate Professor, Pennsylvania State University, USA
- Harold Tobin, Professor, University of Wisconsin-Madison, USA

#### Operation Liaisons

- Gaku Kimura, Professor, University of Tokyo, Japan
- Gregory Moore, Professor, University of Hawaii, USA
- Michael Underwood, Professor, University of Missouri, USA
- Kyuichi Kanagawa, Professor, Chiba University, Japan

And 22 scientists selected from IODP member countries.

#### \*1. The Integrated Ocean Drilling Program (IODP).

IODP is an international marine research-drilling program dedicated to advancing scientific understanding of the Earth by monitoring and sampling subseafloor environments. Through multiple platforms, scientists explore IODP's principal themes: the deep biosphere, environmental change, and solid Earth cycles. IODP has been in operation since October 2003, funded jointly by the Japan Ministry of Education, Culture, Sports, Science and Technology and by the U.S. National Science Foundation. The 18-member European Consortium of Ocean Research Drilling (ECORD), the People's Republic of China, the Republic of Korea, India, Australia and New Zealand (ANZIC), and the Federal Republic of Brazil provide additional support.

\*2. Dense Ocean-floor Network System for Earthquakes and Tsunamis (DONET)  
DONET is an ocean-floor observatory network established to achieve real-time monitoring of seismic and tsunami activities and to provide better earthquake

prediction models in the focal region of the Tonankai earthquake in the Kumano Basin, off the Kii peninsula. DONET allows simultaneous and real-time measurements at multiple points on the deep sea floor, not possible with conventional observatory networks. In Spring of 2013, the NanTroSEIZE Long Term Borehole Monitoring System (LTBMS) was finally hooked into the DONET network, supplying real-time data from all observatory instruments to the Japan Meteorological Agency and National Research Institute for Earth Science and Disaster Prevention.

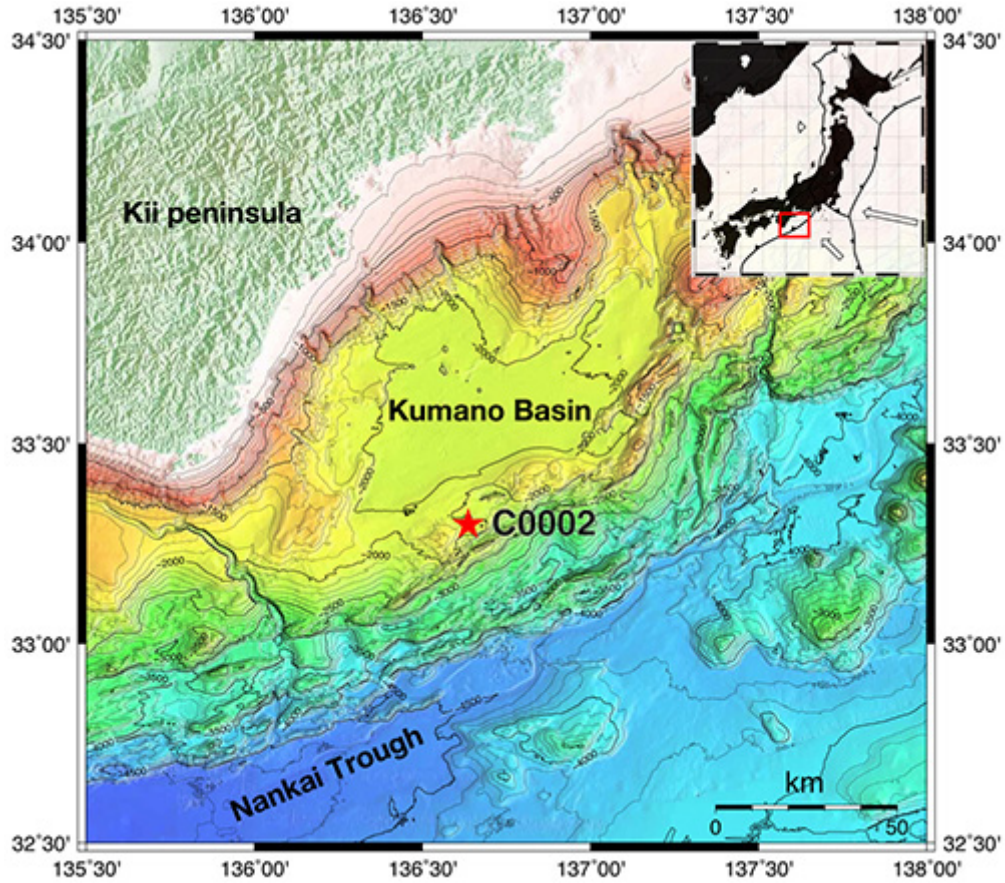


Figure 1 Study Area

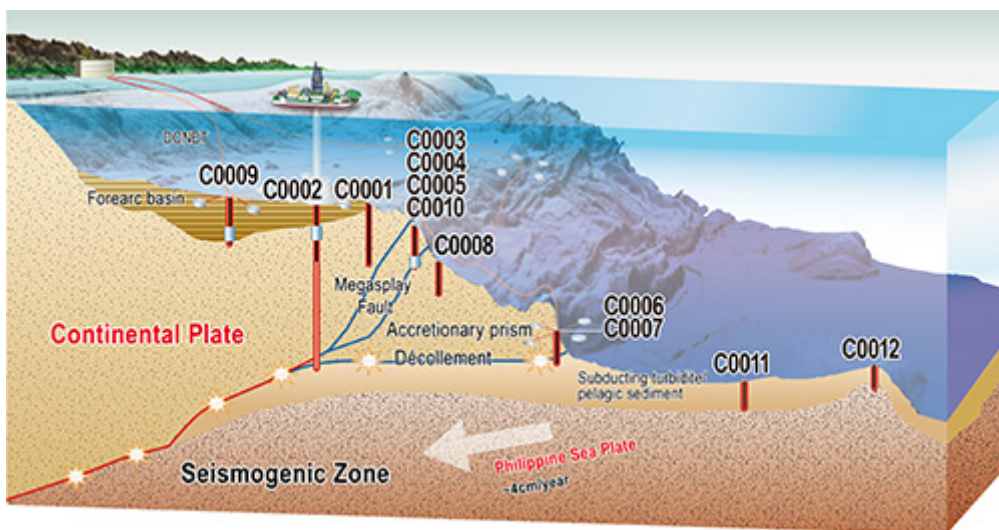


Figure 2 Drilling Site(C0002)

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