Editorial Preface

Dear Reader:

We are happy to report that scientific ocean drilling will continue beyond the current Integrated Ocean Drilling Program (IODP), which ends September 2013. A new program, the International Ocean Discovery Program is planned to replace IODP by October 2013 without interruption of operations. What is more, the International Scientific Continental Drilling Program (ICDP) is advancing towards renewal in fall of 2013 (p. 77).

On the backdrop of this exciting news, this issue brings reports that illuminate the incompletely understood workings of the interior of our planet, the mechanisms of subduction-related earthquakes, and the exploration of the distribution of subsurface microbial life below one of the most nutrient-starved ocean basins on Earth. Drilling into the Louisville Seamount chain in the Pacific Ocean (p. 11) in a comparison to previous studies of the Hawaii-Emperor Seamount chain suggests that the mantle roots ("plumes") of these linear chains of volcanic hot-spot activity move relative to each other, and it is speculated that subduction of oceanic lithosphere can induce a complex mantle flow causing hotspots to move differently. The relationship between plate subduction and major earthquakes is the topic of a drilling project off Costa Rica (p. 23). In this location, the downgoing plate is believed to erode the basis of the overriding plate, unlike other subduction zones in which material is scraped off the downgoing plate and accumulated as an accretionary prism overlying the seismogenic zone.

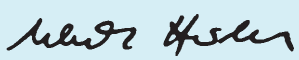
Like chains of seamounts, the Yellowstone Hotspot spur in the Snake River Plain of Idaho suggests a deep mantle root of this hotspot below the North American plate. A drilling project (p.36) addresses the deep nature of this fascinating super-volcano, as well as explores whether its track through Idaho created geothermal energy sources. Another ambitious project will investigate in detail how Earth's crust below the oceans is forming. The Semail Ophiolite of Oman is proposed to ICDP (p. 64) as the place to examine the detailed 3-D nature of the crust-mantle transition, how melt is transferred from the mantle into the crust, and how it is distributed within the crust. IODP drilling results on this same general topic—and recovered from a so-called tectonic window in the Atlantic Ocean into the deeper ocean crust—are reported (p. 31).

Each new step of exploration of subsurface microbial life provides novel data from this vast and largely unknown habitat for life. IODP recovered cores from below the nutrient-starved South Pacific Gyre (p. 4). Extremely low microbial activity is indicated within the marine sediments of this vast area, suggesting that previous estimates of total subsurface biomass beneath the oceans may need a downward revision.

Engineering developments play a crucial role in scientific drilling. Consequently, we offer reports on real-time natural gamma-ray spectrometry (p. 57), a new heave compensation system for wireline borehole instruments (p. 46), and a wireline downhole penetrometer to record formation pressure and temperature (p. 51).

We wish readers some relaxing time in their armchairs reading about the diverse topics covered by this issue of *Scientific Drilling*!

Hans Christian Larsen
Editor-in-Chief



Ulrich Harms
Editor

Jamus Collier
Managing Editor

Front cover: The most sampled core from Exp.330 with many stickers used to mark requested samples. (Photo Credit: Takeshi Hanyu & IODP)
Left inset: Scientists taking part in a hard rock sampling party (Photo Credit: Exp. 334, John Beck, IODP/TAMU)

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IODP is an international marine research drilling program dedicated to advancing scientific understanding of the Earth by monitoring and sampling subseafloor environments. Through multiple drilling platforms, IODP addresses its four principal challenges: Climate and Ocean Change, Biosphere Frontiers, Earth Connections, and Earth in Motion.

ICDP is a multi-national program designed to promote and coordinate continental drilling projects with a variety of scientific targets at drilling sites of global significance.

Publication Office
IODP-MI, Tokyo University of Marine Science and Technology,
Office of Liaison and Cooperative Research 3rd Floor,
2-1-6, Etchujima, Koto-ku, Tokyo
135-8533, JAPAN
Tel: +81-3-6701-3180
Fax: +81-3-6701-3189
e-mail: journal@iodp.org
www.iodp.org/scientific-drilling/

Layout, Production and Printing
Mika Saido (IODP-MI), and
Obun Printing, Co. Inc., Tokyo, Japan

IODP-MI
Tokyo, Japan
www.iodp.org
Program Contact: Miyuki Otomo
motomo@iodp.org

ICDP
GFZ German Research Center For Geosciences
www.icdp-online.org
Program Contact: Ulrich Harms
ulrich.harms@gfz-potsdam.de

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