Editorial Preface

Dear Reader:

A year has passed since the disaster of the Great Eastern Japan Earthquake struck on 11 March 2011, causing major devastation including a nuclear power plant accident that has challenged nuclear energy policies in Japan and worldwide. The magnitude of the earthquake, the displacement of the seafloor, and the associated tsunami took not only the people of Japan but also the scientific world by surprise. With less public attention, 2011 also saw a large increase in the anthropogenic emission of CO_2, a trend which, if it continues, may pose long-term global threats to societies.

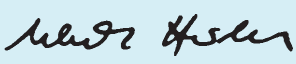
Can scientific drilling help alleviate such geohazards and climate change? No, just as taking out fire insurance does not prevent fires. But scientific drilling can help predict cycles and frequency of events, potential magnitudes, and general locations of major geohazards. For example, this spring the IODP drilling vessel *Chikyu* will attempt to sample the rupture zone that on 11 March 2011 moved the ocean floor an unprecedented 30–50 meters off the coast of Japan. What conditions along the fault zone make such a displacement possible?

To avoid being taken by surprise by events caused by severe and rapid climate change is also what scientific drilling aims at. Both IODP and ICDP draw on the unique repository of past climate and environmental records preserved in marine and lake sediments, and they maintain a scientific community trained over multiple decades in reading the fine print within such sediment cores. The reading so far is not encouraging. The rate of anthropogenic forcing of atmospheric CO_2 content and associated acidification of the oceans seems unprecedented in the last 50–60 million years of geological history. This suggests we are setting back the climate clock of Earth to a fundamentally different environment from the one that we have adapted to over many millennia.

The question is not about survival of humankind. It is about how quickly and profoundly such changes may take place, and therefore, if and how society can acclimatize to potentially drastic changes in precipitation patterns and climate zones, rising sea level, and ocean acidification—environmental conditions key to food production and infrastructure. Feedback mechanisms within Earth systems are highly complex and may result in tipping points, an "environmental earthquake" if you wish. We cannot afford not to use history as a guide for how rapidly and dramatically the global environment can change. Similarly, we need to study the records of past geohazards and the mechanisms by which they occur.

For the past three decades, planning for scientific drilling has pointed out global environmental change as a key research topic, and has with increasing prominence included geohazards over the last decade. In a time of program renewal (IODP in 2012–2013, ICDP in 2013–2014), many within the scientific community are concerned that such scientific foresight and preparedness to address key societal issues might not be broadly recognized. As a reader of *Scientific Drilling*, you can make a difference by explaining to the public and to funding agencies the high societal importance of scientific drilling—now and in the future.

Hans Christian Larsen
Editor-in-Chief



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Front cover: Instruments deployed on the CORK installed in Hole U1362B on the eastern flank of the Juan de Fuca Ridge (Exp. 327), during Expedition AT18-07 (with the R/V *Atlantis* and the ROV *Jason*) in Summer 2011.
Left inset: A scientist analyzing clean samples in the core splitting room. (Exp.335)

Scientific Drilling
ISSN 1816-8957 (printed version)
1816-3459 (electronic version)

Scientific Drilling is a semiannual journal published by the Integrated Ocean Drilling Program (IODP) with the International Continental Scientific Drilling Program (ICDP). The editors welcome contributions on any aspect of scientific drilling, including borehole instruments, observatories, and monitoring experiments. The journal is produced and distributed by the Integrated Ocean Drilling Program Management International (IODP-MI) for the IODP under the sponsorship of the U.S. National Science Foundation, the Ministry of Education, Culture, Sports, Science and Technology of Japan, and other participating countries. The journal's content is partly based upon research supported under Contract OCE-0432224 from the National Science Foundation.

Electronic versions of this publication and information for authors can be found at http://www.iodp.org/scientific-drilling/ and http://www.icdp-online.org/scientific-drilling/. Printed copies can be requested from the publication office.

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.

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All figures and photographs courtesy of the IODP or ICDP, unless otherwise specified.