



## Dear Reader:

A strong Northern Hemisphere 2010 winter might have shifted attention away from the issue of climate change, but climate change is about more than just annual weather patterns. Research must focus on broader impacts, such as the effect of changes in the oceans' water masses on global climate. The refurbished ocean drilling vessel *JOIDES Resolution (JR)* made its 'maiden voyage' in the equatorial Pacific Ocean in 2009. This area absorbs solar radiation into a giant warm water pool and is the source of the inter-annual El Niño Southern Oscillation phenomenon (ENSO) affecting the climate of the entire circum-Pacific and beyond. A drilling transect by the *JR* from the northwestern to southeastern equatorial Pacific took advantage of lithospheric plate motion to recover high-resolution sedimentary equatorial sections from most of the Cenozoic era (p. 4); this will enable a much better understanding of the global climate control exerted by this ocean.

The *JR* proved her reputation as the workhorse of ocean drilling, providing remarkable core recovery to greater depths than ever before; results from these cores can underpin unprecedented detailed analyses of ocean and climate history. Understanding climate and sea-level change of the past is the only real benchmark test for assessing the impact of anthropogenic greenhouse gasses on the global environment. Naturally, as we prepare for a new ten-year program of scientific ocean drilling, societally important fields such as environmental changes, earthquakes and other geohazards are in focus along with principal research themes directed at the fundamental dynamic behavior of our planet. A major milestone of future science planning was achieved with the recent INVEST conference soliciting ideas from across the Earth and life science community for the scientific themes of the new program (summary report on p. 54).

Environmental change is no threat to continued life on Earth, only to the success of specific species (e.g., humans). A milestone study of the ICDP addresses the profound change of the conditions for life on Earth when the atmosphere went from oxygen-poor to oxygen-rich more than two billion years ago. These remarkable ICDP drill cores (p. 23) from western Russia throw new light on this most fundamental change in Earth's exterior environment.

So, dear reader, please take a deep breath (of oxygen) and enjoy the ride through Earth's history and how scientific drilling helps us to understand it!

Hans Christian Larsen  
Editor-in-Chief

Ulrich Harms  
Editor

**Front Cover:** ICDP drilling at the frozen El'gygytgyn (local name in Chukchi language [чукчи] meaning "White Lake") addressing past climate history at extreme northeastern Siberia and the impact of an extraterrestrial bolide that generated the 12-km-wide lake basin 3.6 Ma ago.

**Left inset:** Preliminary geological model of sequence drilled in the Russian Arctic.

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IODP is an international marine research drilling program dedicated to advancing scientific understanding of the Earth by monitoring and sampling seafloor environments. Through multiple drilling platforms, IODP scientists explore the program's principal themes: the deep biosphere, environmental change, and solid Earth cycles.

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](mailto:journal@iodp.org)  
url: [www.iodp.org/scientific-drilling/](http://www.iodp.org/scientific-drilling/)

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Send comments to:  
[journal@iodp.org](mailto:journal@iodp.org)

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Glen Hill, Obihiro, Japan.

### Layout, Production and Printing

Mika Saido and Renata Szarek  
(IODP-MI),  
and  
SOHOKKAI, Co. Ltd., Sapporo, Japan.

### IODP-MI

Tokyo, Japan  
[www.iodp.org](http://www.iodp.org)  
**Program Contact:** Jamus Collier  
[jcollier@iodp.org](mailto:jcollier@iodp.org)

### ICDP

German Research Center for  
Geosciences – GFZ  
[www.icdp-online.org](http://www.icdp-online.org)  
**Program Contact:** Ulrich Harms  
[ulrich.harms@gfz-potsdam.de](mailto:ulrich.harms@gfz-potsdam.de)

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