

Building a Global Data Network for Studies of Earth Processes at the World's Plate Boundaries

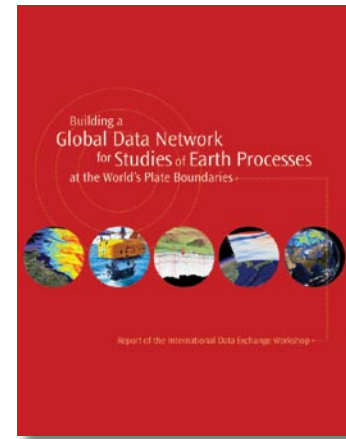
Report of the International Data Exchange Workshop

The international geoscience community is actively engaged in scientifically aligned goals through the InterRidge and InterMARGINS programs, both broad multi-disciplinary initiatives focused on understanding the fundamental processes of crustal formation, modification, and destruction at Earth's plate boundaries. Ridge2000 and MARGINS, US-funded component programs, support focused investigations in a few geographic locations, many of which fall within national boundaries of international partners. At present, there are no formal agreements within these programs for data sharing with foreign partners, and data exchange occurs primarily by informal agreements between scientists directly involved in specific projects. However, significant benefits to these marine-terrestrial geoscience research efforts could be achieved internationally if data collections maintained as national efforts could be better linked and if broader access were initiated. Rapid advances have occurred over the past decade in information technology for scientific research, providing new access to data from distributed resources and new tools for visualization and integration. These technologies will enable independent globally distributed sites to share, link, and integrate their data holdings and services while maintaining full ownership and credit for these holdings.

Along with these advances in information technology has come the growth of digital data collections for a broad suite of data across the sciences. These advances hold great promise for the solid earth sciences, an inherently multinational and multidisciplinary field, which involves the collection of typically unique data sets during oceanic and terrestrial expeditions and subsequent laboratory work conducted by research institutions around the globe.

To explore current opportunities and challenges for international data exchange to support mid-ocean ridge and continental margin research, the workshop entitled "Building a Global Data Network for Studies of Earth Processes at the World's Plate Boundaries" was convened May 9–11, 2007, in Kiel, Germany. InterMARGINS, InterRidge, MARGINS, and Ridge2000 sponsored the workshop. The US National Science Foundation and the German project "The Future Ocean" provided additional financial support. S. Carbotte and K Lehnert (LDEO, Columbia University), Seiji Tsuboi (JAMSTEC), and W. Weinrebe (IFM-GEOMAR) convened the workshop. Seventy-one people from 14 countries attended, including scientists from the InterRidge and InterMARGINS communities, data managers, and information technologists.

The meeting agenda included presen-



tations on science needs for data access, on existing data centers or data resources relevant for continental margins and mid-ocean ridge research, and on emerging technologies for data interoperability and sharing. Working group sessions focused on technological as well as organizational and cultural issues of global data exchange and were organized into four themes: Science User Needs and Concerns; Data Documentation and Publication; Data and Metadata Interoperability; Opportunities and Obstacles for International Data Sharing. From the working group sessions, participants agreed on a number of recommendations, broadly summarized here:

- Open public access to data is fundamental to verifiable scientific progress. All data that are necessary to reproduce published scientific results need to be published and archived in accepted archives. Earth scientists require access to multidisciplinary data and data integrated from both the marine and terrestrial world.
- Uniform best practices and standards need to be developed, promoted, and used routinely within the international community for data acquisition, data submission to data centers, and data publication. Best practices should include the use of globally unique

identifiers for data and samples. New automated tools that support metadata acquisition at sea, in the field, and in the lab are needed to further the implementation of best practices.

- To support interoperability across distributed data resources, the community must minimize the proliferation of metadata standards and work toward a uniform approach for scientific metadata, building upon the work of existing community-based projects. Data centers should work to expose their data resources via Web services to enable data access through programmatic interfaces and broader range of options for data analysis and visualization.
- International programs and bodies such as GEOSS, the eGY, and ICSU should be leveraged to promote an initiative for a global data network for marine and terrestrial geoscience data. A dedicated task group is needed to advance the implementation of a global data network along with special interest groups to share experience and solutions on issues concerning metadata and interfaces.

Further information about the meeting is available at the meeting website (<http://www.nsf-margins.org/Dataworkshop07/>), including Powerpoint presentations and one page summaries with URLs for each of the data systems/resources represented at the meeting. A workshop report is in production and will be available for download from the meeting Web site by late October. ☒

Summary provided by Suzanne Carbotte and Kerstin Lehnert, LDEO of Columbia University.