

have a rich history, and we look forward to their future contributions to our knowledge of the Earth and its interacting systems.

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## MEETINGS

### Workshop Launches International Coalition for GeoInformatics

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A global forum on sedimentary geology and paleobiology was launched at an inaugural meeting at the 32nd International Geological Congress, in Florence, Italy. The workshop developed a collaborative international effort that focuses on next-generation research and education and that provides a forum for individuals and organizations involved in conducting and sponsoring this research.

Thirty-five scientists and 20 representatives of European funding organizations met in the first of a planned series of workshops on "Coordinating GeoInformatics Efforts in Sedimentary Geology and Paleobiology."

Scientists from Germany, Austria, France, and the United States presented current projects and strategies on geoscience database and information management, and discussed issues concerning the necessary information technology (i.e., database interoperability, data sharing, etc.) and the characteristics and infor-

mation needs of their respective geoscience communities.

The workshop was complementary to the meeting held 20 August 2004, by the International Union of Geosciences' Commission for the Management and Application of Geoscience Information (CGI, [http://www.bgs.ac.uk/cgi\\_web](http://www.bgs.ac.uk/cgi_web)), chaired by Kristine Asch (German Geological Survey BGR, [kristine.asch@bgr.de](mailto:kristine.asch@bgr.de)). This first workshop on GeoInformatics concluded with an agreement to form the International Coalition for GeoInformatics (iGeoInfo). Close collaboration with CGI and other interested organizations, groups, and individuals is anticipated.

#### What is the Problem?

The ever-increasing amount and complexity of data and information accumulated in the geological sciences has become overwhelming and has led to a paradoxical situation.

With the enormous number of publications each year—including hard-copy journals and, increasingly, e-journals—and data scattered in numerous formal and informal databases, it has become difficult for the individual researcher to find all data of interest.

The difficulty is exacerbated by the need to then compile these data into formats useful for analysis, whether graphical, statistical, or even map-based. Of particular importance are the unpublished data sources that tend to be heterogeneous in type and quality, organized in many different ways and stored at effectively inaccessible sites, including unpublished data in file cabinets of innumerable researchers. There is also a lack of standard approaches in the formatting of both published data and existing digital databases.

As a result, data collections are difficult to find, and nearly always incomplete, and it is difficult to seamlessly integrate data from different sources. Thus, despite the individual investment of effort in finding data sources, results are far from optimal, and this holds back sedimentary geology and paleobiology research.

Because the fields are at the cusp of defining next-generation research, now is the time to solve these geologic information issues. In addition, data and information management in the geological sciences, which are global sciences, requires coordination and integration on an international level.

### *What is Geoinformatics?*

“Geoinformatics” is the term coined for this geological information technology system. The emphasis of such a system is to provide access to extant and future Earth science research data and easy access to research-grade tools. It must provide a mechanism to synthesize these global data, visualize them in new ways, and seamlessly use old and new numerical and statistical tools on what have been, up to the present time, inaccessible data sets.

It includes high-level as well as desktop modeling. It encompasses education and outreach. The entire system must be conceptually and physically available to the entire community—from the large research universities to the smallest college, primary and secondary schools, and informal education organizations. Finally, it must provide real opportunities for wide participation—a few cannot do this for the many—and it must be a community system.

In short, it must become a platform for development of a heretofore unprecedented understanding of the Earth system.

Earth science research, by its very nature, requires analysis of complex and increasingly large data sets and is inherently global. These data will contain the details of the 4-dimensional geology, geochemistry, geophysics, and paleobiology of the Earth. High-quality digital Earth-framework data layers will be Web-accessible to all scientists and educators.

This activity will have the added benefit of preserving vast amounts of geoscientific data from previous generations (legacy information data sets); these would include field observations, process measurements, maps, cross sections, and associated metadata.

For Geoinformatics to be successful, databases have to be built and maintained, modified and expanded, and updated and translated. Data mining and other methodologies have to be developed and refined to allow researchers to

easily, rapidly, and accurately access these data. Visualization, numerical, and statistical tools have to be developed that allow the users to easily but exhaustively assess and synthesize these data as they ask a myriad of questions.

These tools also have to be maintained and updated, with new ones developed as users ask questions in different ways, as the databases expand, and as information technology advances.

Finally, the system must encompass high- and low-level numerical modeling. Some of the modeling efforts will be very intensive and require significant resources on their own part; the role of the system is to connect the models with the data that they must ultimately be tested with, to ensure that the models are available to the entire community and that the codes are updated as necessary and archived.

Thus, the Geoinformatics system starts with the mundane process of data acquisition and database construction, and ends with the tools and models that will help define the next generation of science.

Because of the global nature of the science, the Geoinformatics system must also be global. The international communities must work together to develop, manage, and deploy these data and products. No single group or institution can do all of this in terms of physical or intellectual capacity. Furthermore, this is by nature a real community effort—real in the sense that a large proportion of the community will be actively involved. Geoinformatics can become an engine to help drive the next generation of science. These needs were the rationale for this workshop.

### *Become Involved*

In response to the discussions at this workshop, representatives, among others, from CHRONOS, PaleoStrat, PANGAEA (World Data

Center Mare), Stratigraphy.Net, Geoscience Network (GEON), and GeoForschungsZentrum (GFZ) Potsdam have started an initiative to identify, coordinate, and integrate the available sedimentary geology and paleobiology data sources, and to strengthen the collaboration of the world's major Earth science data centers. Activities will be coordinated through the newly founded international coalition for Geoinformatics (iGeoInfo, <http://www.igeoinfo.org>), which is hosted at GFZ Potsdam.

All interested individuals and organizations are invited to join iGeoInfo to discuss and promote a future common strategy on geoinformation management. To reach a broader audience and to continue the discussion, workshop members have proposed a session at the next European Geoscience Union (EGU) Meeting (Vienna, 25–29 April 2005) called “Geoinformatics in Stratigraphy, Sedimentology, and Paleontology.”

For further information on the EGU session and iGeoInfo, please see the Web site or contact Jens Klump ([jens.klump@gfz-potsdam.de](mailto:jens.klump@gfz-potsdam.de)), Robert Huber ([robert.huber@stratigraphy.net](mailto:robert.huber@stratigraphy.net)), Cinzia Cervato ([cinzia@iastate.edu](mailto:cinzia@iastate.edu)), or Walter Snyder ([wsnyder@boisestate.edu](mailto:wsnyder@boisestate.edu)).

The Workshop on “Coordinating Geoinformatics Efforts in Sedimentary Geology and Paleobiology” was held in Florence, Italy, on 20 August 2004.

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