

2001-
2000

Grant Title:

**BOARD ON EARTH SCIENCES AND RESOURCES
AND ITS ACTIVITIES**

**PERFORMANCE REPORT
January 15, 1996 - January 14, 1997**

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Board on Earth Sciences and Resources
Commission on Geosciences, Environment, and Resources
National Research Council
Washington, D.C. 20418

Grant Number: NAG 5-2866

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CONTINUING ACTIVITIES

COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

BOARD ON EARTH SCIENCES AND RESOURCES

TASK: The Board will provide oversight of the earth science and resource activities within the National Research Council, provide a review of research and public activities in the solid-earth sciences, and provide analyses and recommendations relevant to the supply, delivery, and associated impacts of and issues related to hydrocarbon, metallic, and non-metallic mineral resources. The Board will monitor the status of the earth sciences, assess the health of the disciplines, and identify research opportunities, and will respond to specific agency requests.

ACTIVITIES:

The Board on Earth Sciences and Resources is the focal point for National Research Council activities related to solid-earth science issues in research, education, the environment, geologic hazards, information management, and resource utilization. The Board conducts its activities through more than a dozen separately appointed committees and panels of volunteer earth scientists drawn from academia, industry, and government.

The Board and its committees released 21 peer-reviewed reports in 24 months during 1994-95, and it expects to release 9 reports in 1996. These reports provide recommendations on national and international policy, address the state of science and technology, and review federal programs and agencies. They are summarized in the *Biennial Report of the Board on Earth Sciences and Resources*. Additional information on the Board's activities is provided on its Web page (<http://www2.nas.edu/besr>).

The Board's recent reports have been featured in Congressional hearings and briefings, formed the basis of an Executive Order signed by President Clinton and a recommendation in Vice President Gore's National Performance Review, and influenced national and international policy regarding restrictions on access to scientific data. The Board's reports have also been featured in the scientific literature, including *Science* and *Nature*, and the popular press, including newspapers, television, and national magazines.

The earth sciences are at a critical juncture in their evolution. The Board on Earth Sciences and Resources stands ready to assist public and private agencies and foundations as they prepare for the 21st century.

SOURCES OF FUNDING: The Board receives core funding from a variety of federal agencies and ad hoc funding for specific studies.

1995

THE Geosciences IN REVIEW

OUTLOOK

National Research Council

The National Research Council (NRC) is the principal operating agency of the National Academy of Sciences and the National Academy of Engineering. It serves as an independent adviser on scientific and technical questions of national importance. The NRC brings the resources of the entire scientific and technical community to bear on national problems through its volunteer advisory boards and committees. The nation's science and technology is facing unprecedented challenges in these turbulent times. The NRC has a mandate to respond to requests from federal agencies as they redefine their mission, restructure their programs, and become more responsive to customer needs and societal goals.

The Board on Earth Sciences and Resources is the focal point for the Council's advice on solid-earth sciences issues related to research, education, the environment, geologic hazards, and resource utilization. The Board identifies opportunities for advancing basic research and understanding, analyzes the credibility of earth science information for policy decisions, and reports on the applications of earth sciences to important societal issues. Through its actions, the Board addresses the overall health of research and education programs related to solid-earth sciences and resource issues. The Board also serves as a forum for discussions and exchange of information among government, university, and industry scientists, and policy-makers.

The Board conducts its activities through more than 10 separately appointed committees and panels of volunteer geoscientists drawn from academia, industry, and government. The Board and its committees released 19 peer-reviewed reports in 1994-95. These reports provide recommendations on national and international policy, address the state of science and technology, and review federal programs and agencies.

National and international policy

Several recent reports by the Board have had a significant impact on national and international policy. The Committee on Geophysical and Environmental Data released an influential report, *On the Full and Open Exchange of Scientific Data*. This report, which was completed in less than one month, was a crucial factor in the U.S. decision to oppose a proposal to restrict access to scientific data that was under consideration by the World Meteorological Organization. In the face of strong U.S. opposition, the proposal was not brought to a vote at the World Meteorological Organization Congress in Geneva.

The Mapping Science Committee has issued a series of reports that have influenced the development of the National Spatial Data Infrastructure. Its 1993 report, *Toward a Coordinated Spatial Data Infrastructure for the Nation*, resulted in a recommendation in Vice President Gore's *National Performance Review* and formed much of the basis of an executive order signed by President Clinton. The concept of a National Spatial Data Infrastructure has been further elaborated in subsequent reports by the Mapping Science Committee in 1994 and 1995.

Since its inception in 1960, the Committee on Seismology has played an important role in scientific issues related to monitoring underground nuclear testing and compliance with nuclear nonproliferation agreements. Its latest contribution is *Seismological Research Requirements for a Comprehensive Test Ban Monitoring System*. Prior to publication of its final report, the committee released two interim reports that provided timely advice to U.S. negotiators at the Comprehensive Test Ban talks in Geneva.

The Board has international responsibilities related to its role in coordinating activities of various U.S. National Committees, including those for the International Union of Geodesy and Geophysics, the International Union of Geological Sciences, the International Society of Rock Mechanics, the International Geographical Union, and the International Union for Quaternary Research.

State of science and technology

The Board on Earth Sciences and Resources has a long history of publishing reports that address the state of science and technology. Recent publications include *Effects of Past Global Change on Life and Airborne Geophysics and Precise Positioning*. Forthcoming studies include *High-Performance Computing in Seismology, Geodynamics of Sedimentary Basins, and Mineral Resources and Sustainable Development: Challenges for Earth Scientists*. The Committee on Re-inventing Geography will release the first comprehensive assessment of the discipline of geography in 30 years. The Board is undertaking a study in collaboration with the Board on Natural Disasters on *The Science of Earthquakes*. It is also undertaking a study in collaboration with the Water Sciences and Technology Board on "Seeing" into the Earth: *Non-Invasive Characterization of the Shallow Subsurface for Environmental and Engineering Applications*.

Reviews of federal programs and agencies

The changing context for science and technology policy in the post-Cold War era has profound implications for federal agencies that support the earth sciences. If recent history is a reliable guide, then the next few years are likely to see programs cut, agencies abolished or consolidated, and perhaps whole federal departments eliminated.

The Board on Earth Sciences and Resources routinely works with federal agencies to identify opportunities, establish priorities, improve the quality of their research, and evaluate whether their research programs are aligned with societal goals. Most recently, it has been asked to conduct reviews of the research programs of the U.S. Bureau of Mines, the Reservoir Class Field Demonstration Program of the Department of Energy, and the Mineral Resource Surveys Program Plan of the U.S. Geological Survey. The Board has conducted similar reviews for other agencies, including the National Oceanic and Atmospheric Administration, NASA, and the National Science Foundation. The Board on Earth Sciences and Resources stands ready to assist federal agencies as they prepare for the 21st century.

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Schiffries is director of the Board on Earth Sciences and Resources of the National Research Council. Many of the reports mentioned in this article are available from the National Academy Press at (800)624-6242 or from the Board on Earth Sciences and Resources.

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COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

COMMITTEE ON EARTH RESOURCES

TASK: The Committee on Earth Resources serves as a focal point for development of new activities relevant to mineral and energy resource affairs in the Board on Earth Sciences and Resources. The committee is responsible for providing analysis and recommendations relevant to the supply, delivery, and associated impacts of and issues related to energy, metallic, and nonmetallic mineral resources. The committee (1) monitors the status of mineral and energy resource affairs; (2) identifies study opportunities and responds to requests from federal agencies; and (3) provides unique avenues for professional contributions from the scientific and technical community to government.

CURRENT AND FUTURE ACTIVITIES

The Committee on Earth Resources has published three reports in 1996. These reports have been featured in a Congressional hearing convened by the House Resources Committee, a bipartisan Congressional forum, and articles in scientific and trade journals.

Maintaining Oil Production from Marginal Fields. At the request of the Office of Fossil Energy of the Department of Energy (DOE), the committee established a panel to review DOE's Reservoir Class Field Demonstration Program. The panel issued an interim report in less than four months after the contract was signed. The final report, *Maintaining Oil Production from Marginal Fields: A Review of the Department of Energy's Reservoir Class Program*, was published in April, 1996. On June 11, the chairman presented the report to the Congressional Oil and Gas Forum, a bipartisan coalition of Senators and Representatives interested in issues involving the U.S. oil and gas industry.

Review of the Mineral Resource Surveys Program Plan of the U.S. Geological Survey. At the request of the U.S. Geological Survey (USGS), the committee established a panel to provide a critical scientific evaluation of the agency's Mineral Resource Surveys Program plan, which was prepared in response to a directive from Congress. The panel operated on a fast-track schedule to complete its report in five months and provide timely advice for the fiscal year 1997 planning process. The report, *Mineral Resources and Society: A Review of the U.S. Geological Survey's Mineral Resource Surveys Program Plan*, was delivered to the USGS on April 30. One month later, Congress convened a hearing on the report, and Samuel Adams testified in his capacity as chairman of the NRC panel that produced the report. The Chief Geologist of the USGS testified that the minerals program has already started to implement the four general recommendations in the report.

Mineral Resources and Sustainability: Challenges for Earth Scientists. In February, the committee issued a brief report on *Mineral Resources and Sustainability: Challenges for Earth Scientists*. Sustainability means different things to different people. This report, which is based on a workshop convened by the committee, examines the concept of sustainability as it pertains to mineral resources and mining, and suggests how earth scientists can contribute more effectively toward the goals of sustainability as it applies to resource depletion and environmental concerns.

Pending Activities. The committee has received approval from the NRC Governing Board to undertake two studies: (1) *Constraints on the Availability of Aggregate Resources*, and (2) *Prevention and Remediation of Surface and Ground Water Contamination by Wastes from Hard Rock Mining, Milling, and Smelting*.

SOURCES OF FUNDING: Core funding for the Board and ad hoc funding for specific studies.



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COMMISSION ON GEOSCIENCES, ENVIRONMENT AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

COMMITTEE ON SEISMOLOGY

TASK: In 1960, the President of the National Academy of Sciences appointed a Committee on Seismological Stations to advise the Defense Advanced Research Projects Agency on the establishment of a Worldwide Standardized Seismograph Network. This committee was renamed the Committee on Seismology in 1964, and in 1967 its membership and scope were enlarged, partly in response to requests for advice and guidance from seismological groups inside and outside the federal government.

CURRENT AND FUTURE ACTIVITIES: The Committee: 1) maintains active surveillance of major trends in seismology and of developments related to seismology in allied scientific and technical fields; 2) provides special studies for government agencies on appropriate subjects or problems; 3) maintains cognizance of and provides advice on international seismological activities; 4) advises government agencies on the operation of government-supported seismograph networks and data-dissemination facilities; and 5) coordinates activities related to seismology within the National Research Council, particularly in the fields of earthquake engineering, rock mechanics, geodesy, geodynamics, geology, and seismic verification of adherence to nuclear test ban treaties.

In addition to these specified charges the meetings of the Committee provide a forum for exchange of ideas and information between the Committee and the liaison members and among the liaison members from various agencies.

The Committee on Seismology has undertaken or is planning several new activities under the guidance of its energetic chair. Ongoing activities (described on separate status reports) include: (1) a review of probabilistic seismic hazard estimates for nuclear plants in the eastern United States for the Nuclear Regulatory Commission (Panel on Seismic Hazard Evaluation); and (2) a review of the basic research requirements in seismology, hydroacoustics, infrasonics, and radionuclide monitoring to support Comprehensive Test Ban Treaty Verification. The latter represents a requested broadening of the scope of the ongoing review of the Air Force seismological research programs. A review of opportunities and challenges for high-performance computing in seismology was published in July 1996. The Committee is also providing critical input and advice to the NAS-funded study Science of Earthquakes (see separate one page summary).

The next meeting of the committee will be December 6 and 7 in Washington DC.

SOURCES OF FUNDING: The Committee is currently being supported by: NSF, DOE, NRC, AFOSR, ARPA, and FEMA.

NRC STAFF: Charles Meade

Updated October 18, 1996



COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
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COMMISSION ON GEOSCIENCES, ENVIRONMENT AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

U.S. GEODYNAMICS COMMITTEE

TASK: The U.S. Geodynamics Committee (USGC) was organized in 1970 to foster and encourage studies of the dynamic behavior of the Earth. In addition, the USGC serves as the U.S. counterpart to the International Lithosphere Program. The USGC has played a role in helping to start and shape such important programs as deep seismic reflection profiling, continental drilling, plate margin studies, electromagnetic study techniques, and transects across continent-ocean boundaries. A principal purpose of the committee is to identify and recommend new thrusts rather than to advise on established programs.

CURRENT AND FUTURE ACTIVITIES:

Two of the USGC's panel studies are described in separate status reports (Earth Gravity from Space and the Geodynamics of Sedimentary Basins). Looking to the future, the USGC is eager to be a strong representative for geodetic concerns within the NRC. The forthcoming Earth Gravity from Space study is an example of this new role. In May, the USGC held planning workshop on increasing the access the SAR radar data for interferometric imaging. This is a rapidly evolving remote sensing technique that has broad application to the study of tectonic processes such as volcanoes and earthquakes. Based on the results of this workshop, Charles Meade and David Sandwell wrote a Perspective piece for Science Magazine on the future of SAR Interferometry. The article prompted a feature in the New York Times on the potential applications for SAR imaging. Charles Meade is currently pursuing opportunities for future USGC studies on this topic.

The USGC will release the Dynamics of Sedimentary Basins report in November 1996.

SOURCES OF FUNDING: DOE, NASA, NSF, and USGS.

NRC STAFF: Charles Meade

Updated October 18, 1996



COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

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COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

**COMMITTEE ON GEOPHYSICAL AND ENVIRONMENTAL DATA
and WORLD DATA CENTER-A COORDINATION OFFICE**

TASK: The Committee on Geophysical and Environmental Data (CGED) provides advice to federal agencies and U.S. data centers on national and international policies for geophysical and environmental data management. The CGED has a defined responsibility for oversight of the World Data Center-A (WDC-A). The Committee provides advice through three main mechanisms: data forums, data center reviews, and committee reports. Data forums are designed to promote interaction between scientists and federal data managers and focus on broad policy issues affecting data management and acquisition. Data center reviews are conducted at the request of the responsible federal agency and are designed to provide direct commentary on the effectiveness of the center in meeting its responsibilities to the scientific user community. Committee reports recommend or evaluate data management policies for individual federal agencies, interagency groups, and international organizations.

CURRENT AND FUTURE ACTIVITIES: The CGED will continue to work with two subcommittees of the federal Committee on Environment and Natural Resources, the Global Change Data Management Working Group and the Task Force on Observations and Data Management, on the following issues:

- Scientific needs for global change data and information;
- Data management aspects of a global observing system;
- Operations and effectiveness of national data centers and WDC-As; and
- International data management issues and data exchange.

Scientific data has become a major source of revenue for several countries, particularly those in Europe. Despite a reaffirmation of the principles of full and open exchange by the World Meteorological Organization, European countries are continuing to withhold data from scientists and data centers. In addition, the World Intellectual Property Organization is considering a proposal to protect all electronic databases from unauthorized use in perpetuity, with no exceptions for scientific research or education. The State Department and OSTP have approached the CGED about producing a follow-on to its report *On the Full and Open Exchange of Scientific Data*. Planning for a study, which might focus on the commercialization of U.S. data centers, is underway.

NASA is planning to reconfigure the EOS Data and Information System (EOSDIS) from a centralized system to a loosely-coupled federation of partners from universities, libraries, the private sector, and other federal agencies. The CGED is completing a study of the ramifications of this change in management models on global change data management. The study contrasts hierarchical and federated management models and is intended to educate the broader global change communities about the advantages and disadvantages of each. As part of this education effort, NASA has asked the CGED, with participation from the Mapping Science Committee and Committee on Global Change Research (CGCR), to convene a workshop on an EOSDIS federation. This request will be discussed at the CGCR meeting in November 1996.

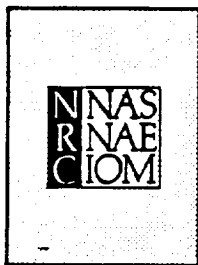
NASA has asked the CGED to conduct a review of seven NASA data centers, known as Distributed Active Archive Centers (DAACs), which manage atmospheric, oceanic, solid-earth, and terrestrial ecosystems data needed to study the Earth. The criteria for review will focus on how well the DAACs serve their scientific and other user communities. NASA is requesting this review as one of many inputs to its decision to recertify, place on probation, or close individual DAACs. A prospectus has been prepared for the November Governing Board meeting.

The USDA has proposed to create a WDC-A for Terrestrial Ecosystems, and the CGED is providing general guidance on its development. Formal review of the proposed USDA center, as well as 4 proposed NASA centers will be initiated at the agencies request.

The CGED is constituting a separately-appointed panel to review the WDC-A for Glaciology/National Snow and Ice Data Center. As input for the report, the panel will conduct a site visit in 1996.

SOURCE OF FUNDING: Subcommittee on Global Change Research, which operates under the Committee on Environment and Natural Resources of the National Science and Technology Council.

NRC STAFF: Anne M.



COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

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COMMISSION ON GEOSCIENCES, ENVIRONMENT AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

MAPPING SCIENCE COMMITTEE

TASK: The Mapping Science Committee serves as a focus for advice to the federal agencies on scientific and technical matters related to spatial data handling and analysis. The purpose of the committee is to provide advice on the development of a robust national spatial data infrastructure for making informed decisions at all levels of government and throughout society.

The principal audience for the committee's products is currently the Federal Geographic Data Committee (FGDC), which operates under the Office of Management and Budget. Agencies that currently support the activities of the committee are the USGS, Defense Mapping Agency, Bureau of the Census, Bureau of Land Management, NOAA, and the Natural Resources Conservation Service. Additional support is being sought from EPA, Department of Transportation, and NASA. In the future, FGDC will probably act as the focus of the committee's support.

RECENT ACTIVITIES:

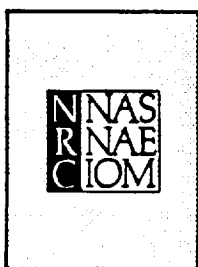
- In 1993 the committee issued a report, *Toward a Coordinated Spatial Data Infrastructure for the Nation*, which assesses the current status of the infrastructure and recommends ways of making it more efficient and robust. The report resulted in a recommendation in Vice-President Gore's **National Performance Review** and was the subject of a Presidential Executive Order (April 11, 1994).
- The committee will continue to provide a focus for discussion of mapping and spatial data issues. The committee anticipates that this will involve close working relationships with the FGDC.
- The committee is discussing with the FGDC a series of forums to critique FGDC plans.
- *Implementation of an NSDI*. The committee is developing a number of short reports to help implement a more robust NSDI as discussed in the above report. Included among these themes are:
 - How should **priorities** be assigned to "**national**" data sets within the NSDI? Report: *A Data Foundation for the NSDI* (1995)
 - What is the role of **state partnerships** within the NSDI? Report: *Promoting the NSDI through Partnerships* (1994)
- The committee, in cooperation with the NRC Marine Board, issued a report in 1994 on *Charting a Course into the Digital Era: Guidance for NOAA's Nautical Charting Mission*. A follow-on report, *Technical Issues in NOAA's Nautical Chart Program*, examined NOAA's nautical chart production capacity/methodologies and was issued in Spring 1996.

FUTURE ACTIVITIES:

- The principal activity in 1996 for the committee was a workshop/forum on what the NSDI might look like in 2010-2015. The report is in the final stage of committee approval and should be issued by the end of 1996.
- The committee, following its October 14-16 meeting, is in the process of developing its work plan for the coming few years.

FUNDING: National Imagery and Mapping Agency, Department of Agriculture, NOAA, USGS, BLM, DOT, FGDC; minor private sector funds.

NRC STAFF: Thomas M. Usselman



COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

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COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

U.S. NATIONAL COMMITTEE FOR ROCK MECHANICS

TASK: The committee provides for U.S. participation in international activities in rock mechanics, principally through adherence to the International Society for Rock Mechanics (ISRM). It also keeps the U.S. rock mechanics community informed about new programs directed toward major areas of national concern in which rock mechanics problems represent critical or limiting factors, such as energy resources, excavation, underground storage and waste disposal, and reactor siting. It provides this information through the U.S. Symposium on Rock Mechanics and the North American Rock Mechanics Symposium held in alternating years. The committee also guides or produces advisory studies and reports on problem areas in rock mechanics.

CURRENT AND FUTURE ACTIVITIES

Publication and Dissemination of *Rock Fractures and Fluid Flow*. In August, the National Academy Press published hard-bound copies of *Rock Fractures and Fluid Flow—Contemporary Understanding and Applications*, a 551-page book produced under the auspices of the U.S. National Committee for Rock Mechanics. The USNC/RM has distributed several hundred copies of the book, and we are working with the National Academy Press to provide review copies to leading scientific journals. It is anticipated that the book will become a standard reference in the fields of rock mechanics and hydrology. A summary of the book is provided below:

Rock Fractures and Fluid Flow—Contemporary Understanding and Applications: Scientific understanding of fluid flow in rock fractures—a process underlying contemporary earth science problems from the search for petroleum to the controversy over nuclear waste storage—has evolved almost entirely in the past 20 years. This volume is the first-ever comprehensive report on the state of the field, with an interdisciplinary viewpoint, case studies of fracture sites, illustrations, conclusions, and research recommendations.

The book addresses these questions: How can fractures that are significant hydraulic conductors be identified, located, and characterized? How do flow and transport occur in fracture systems? How can changes in fracture systems be predicted and controlled?

Among other topics, the committee provides a geomechanical understanding of fracture formation, reviews methods for detecting subsurface fractures, and looks at the use of hydraulic and tracer tests to investigate fluid flow. The volume examines the state of conceptual and mathematical modeling, and it provides a useful framework for understanding the complexity of fracture changes that occur during fluid pumping and other engineering practices.

[National Academy Press, 1996, 551 pp]

Approval of New Study on Conceptual Models of Fluid Infiltration in Fractured Media. The U.S. National Committee for Rock Mechanics is developing a new study on Conceptual Models of Fluid Infiltration in Fractured Media. The Executive Committee of the Governing Board of the National Research Council approved the prospectus for this study on September 10, 1996. A summary of the project is provided below:

Conceptual Models of Fluid Infiltration in Fractured Media: The National Research Council proposes to undertake a study on conceptual models of fluid infiltration in fractured media. A panel under the auspices of the U.S. National Committee for Rock Mechanics will convene a workshop and produce a consensus report of its findings and conclusions. A series of individually authored papers presented at the workshop will be appended to the report. The study will focus on the scale, complexity, and site specific conditions and processes that need to be determined in order to develop an appropriate conceptual infiltration model. Its aim is to provide ideas and support for furthering the technical bases for reviewing conceptual models of fluid infiltration in fractured media. It is anticipated that the study will lead to a better understanding of the variety of conceptual models, promote the development of procedures for determining an appropriate conceptual model, and examine comparison strategies for discriminating among models.

This study will build upon the USNC/RM's recent study *Rock Fractures and Fluid Flow: Contemporary Understanding and Applications*, which recommends that the development of conceptual models for fluid flow and transport in fractured rock should be a focus of future research. According to the report, building the conceptual model is the most important part of the modeling process. Numerical models developed from inappropriate conceptual models can have large uncertainties that are difficult to quantify, and may lead to results that differ significantly from the physical systems they seek to describe. In many applications, errors in flow and transport predictions could be contentious, dangerous, or costly. Development of realistic conceptual models for multiphase fluid flow in fractures is a critical research problem for nuclear waste repository siting, enhanced oil recovery, and for addressing subsurface contamination by aqueous and nonaqueous phase liquids.

USNC/RM Workshop on Bridging the Gap between Science and Practice. A workshop on Bridging the Gap between Science and Practice in Rock Mechanics and Rock Engineering was convened by the USNC/RM on June 22, 1996, in conjunction with the committee's semiannual meeting and the North American Rock Mechanics Symposium in Montreal. The rock mechanics and rock engineering community recognizes that the gap between science and practice is widening. The purpose of this workshop was to identify and discuss possibilities to facilitate and increase interaction between researchers and practitioners.

International Society for Rock Mechanics Symposia. The USNC/RM provides for U.S. participation in international activities in rock mechanics principally through adherence to the ISRM. The USNC/RM's continuing role in a series of ISRM symposia is described below:

1996 North American Rock Mechanics Symposium (Montreal, Canada). The 1996 North American Rock Mechanics Symposium (NARMS'96) was held in Montreal, Canada from June 19-21. The USNC/RM represents the United States on the NARM Symposium Committee, which is responsible for the overall quality and continuity of the NARM Symposia. Approximately 475 people from 34 countries attended NARMS'96. In addition to convening a workshop and holding its semiannual committee meeting at NARMS'96, the USNC/RM also

presented three major awards—Ph.D. Thesis Award, Masters Thesis Award, and Applied Research Award—at a plenary session of the symposium.

1996 Eurock Symposium (Turin, Italy). The USNC/RM was represented by Herbert Einstein at the ISRM International Symposium and the ISRM board, commission, and council meetings in Turin, Italy from August 31 to September 5, 1996. Dr. Einstein is a member of the U.S. National Committee for Rock Mechanics, Vice President for North America of the ISRM, and First Vice President of the ISRM.

1997 U.S. Rock Mechanics Symposium (New York City). The USNC/RM will sponsor the 36th U.S. Rock Mechanics Symposium (NYRocks'97) on June 29 to July 2, 1997 at Columbia University. The theme of the meeting is "Linking Science to Rock Engineering." This meeting is an ISRM international symposium, and the USNC/RM was responsible for selecting Columbia University's proposal to host the meeting. The USNC/RM is working with the organizers of the symposium to publicize the meeting and to provide advice regarding publication of the proceedings.

1998 North American Rock Mechanics Symposium (Cancun, Mexico). The USNC/RM is participating in planning for the 3rd North American Rock Mechanics Symposium on June 3-5, 1998 in Cancun, Mexico. The theme of the meeting is "Rock Mechanics, Earth Crust Mechanics." This meeting is an ISRM regional conference. The USNC/RM represents the United States on the NARM Symposia Committee, which is responsible for the overall quality and continuity of the NARM Symposia.

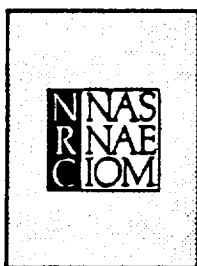
2003 International Congress on Rock Mechanics (United States). On June 18, 1996, the USNC/RM and the American Rock Mechanics Association (ARMA) sent a letter to the president of the ISRM expressing an interest in hosting the 2003 International Congress of the ISRM in the United States. By that time, it will have been nearly 30 years since the last International Congress in the United States. A presentation of the United States proposal was made at the recent ISRM meeting in Turin, Italy. During the coming year, the USNC/RM and ARMA will put an organizing structure into place and develop specifics of the proposal.

USNC/RM Home Page on World Wide Web. The USNC/RM has established a home page on the Word Wide Web. The home page (accessible through <http://www2.nas.edu/besr>) contains information about recent and forthcoming events sponsored by the USNC/RM, as well as links to other sites of interest to the rock mechanics community.

SOURCES OF FUNDING: Core funding is provided by DOE-Yucca Mountain Project, Bureau of Mines, Nuclear Regulatory Commission, National Science Foundation, and Air Force Office of Scientific Research. Exxon provides funds to advertise the rock mechanics symposia.

NRC STAFF: Craig M. Schiffries

Updated October 19, 1996



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COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

**U.S. NATIONAL COMMITTEE FOR THE
INTERNATIONAL UNION OF QUATERNARY RESEARCH
(USNC/INQUA)**

TASK: The purpose of the USNC/INQUA is to promote the advancement of Quaternary sciences in the United States and throughout the world, and to effect participation of the U.S. scientific community in the activities of the International Union of Quaternary Sciences (INQUA) through the National Academy of Sciences-National Research Council, which is the U.S. adhering body to INQUA.

Objectives and Operations: The USNC/INQUA represents the eighteen INQUA-recognized fields that constitute Quaternary research: archeology, botany, climatology, ecology, geochemistry, geography, geology, geomorphology, geophysics, hydrology, invertebrate paleontology, limnology, oceanography, palynology, physical anthropology, soil science, vertebrate paleontology, and zoology. The Committee interacts with and is supportive of the U.S. members of eleven INQUA Commissions and other Inter-Congress Committees, Sub-Commissions, and Working Groups. The USNC/INQUA works in cooperation with scientific societies, several of which are represented on the Committee.

The U.S. National Committee for INQUA plans and arranges for U.S. participation in INQUA congresses and programs. The INQUA Congresses are held every 4-5 years; accordingly, the USNC/INQUA work is organized in a series of steps to ensure that the interests and participation of U.S. scientists are well represented at the international planning level. These efforts provide:

- a) good public exposure for U.S. work on the Quaternary;
- b) contact by U.S. scientists with Quaternary experts from other parts of the world, enabling U.S. scientists to stay on the cutting edge of their fields.

The USNC/INQUA normally holds one formal meeting each year, in conjunction with a professional society meeting like the Geological Society of America, and informal meetings, especially in association with the meetings of the American Quaternary Association.

CURRENT AND FUTURE ACTIVITIES: The USNC/INQUA regularly reviews the scope of existing INQUA commissions and develops recommendations regarding ongoing activities and possible new commissions. The committee provides direct input to the activities of INQUA through its President, Stephen Porter (USA). In addition, the USNC/INQUA has undertaken a report on the role of solid-earth science in global change research. This report describes the issues, methods, technologies, and educational aspects of studies on the changing surface of the earth. The report will be submitted to the journal *Quaternary International*.

At its November 1995 meeting, the USNC informally approved the new constitution proposed by the NRC Office of International Affairs (see description in USNC/IUGG status report). The committee submitted nominations for a chair and new members in the various Quaternary research disciplines. Funding for the USNC/INQUA was delayed by several months, however, and a nominations package for a new committee was similarly delayed. It is anticipated that a new committee will be appointed and will meet in the winter.

SOURCE OF FUNDING: NSF

NRC STAFF: Anne M. Linn

COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

**U.S. NATIONAL COMMITTEE FOR THE
INTERNATIONAL UNION OF GEOLOGICAL SCIENCES
(USNC/IUGS)**

TASK: The purpose of the USNC/IUGS is to promote the advancement of geological sciences in the United States and throughout the world, and to effect participation of the U.S. scientific community in the activities of the International Union of Geological Sciences (IUGS) through the National Academy of Sciences-National Research Council, which is the adhering body to the IUGS.

Objectives and Operations: The tasks of the USNC/IUGS include the following: identify local or regional geological problems and opportunities that can benefit from international study; provide input on new or existing IUGS programs and activities; provide guidance on national or regional capacities to assist IUGS (scientifically, financially, administratively) in its activities and initiatives; ensure that the local geological community is aware and makes use of IUGS programs; ensure that, whenever appropriate, balanced representation (geographic and disciplinary) exists on IUGS projects and administrative bodies; on behalf of IUGS, monitor, promote and report on local and regional geological activities; and communicate at least annually with the IUGS Executive Committee through Robin Brett (USA), President of IUGS.

The USNC/IUGS works in cooperation with scientific societies, several of which are represented on the Committee. It normally meets once a year in connection with a major geological society meeting.

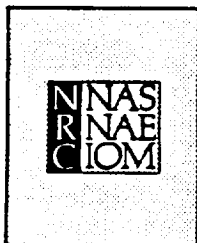
CURRENT AND FUTURE ACTIVITIES: Currently, six committees – formally considered standing subcommittees of the USNC/IUGS – serve as the U.S. national counterparts to international activities closely related to IUGS. For technical reasons, the first listed is designated as a U.S. National Committee; the remaining five are designated as U.S. Committees. The six committees are: (1) the U.S. National Committee for the International Geological Correlation Program and the U.S. Committees for (2) History of Geology (3) the International Association of Engineering Geologists (4) the International Association of Hydrogeologists (5) the International Association of Mathematical Geologists and (6) the International Permafrost Association.

The 30th International Geological Congress was held in Beijing in August 1996. The USNC/IUGS obtained funds from NSF to provide partial travel support to seven American scientists attending the Congress, and formed a grant selection committee to rank the applicants. The awards were administered through AGU. In addition, NSF provided sufficient core funds to the committee to enable the USNC/IUGS chair and NRC staff to attend the Congress. Both served as members of the NAS delegation to the Congress. The NAS delegation held 2 meetings at the beginning of the Congress and reported the results of the Congress to NSF in September 1996.

The USNC/IUGS will hold its last meeting in October 1996. The meeting will focus on lessons learned, potential activities for the new USNC, and nominations for new committee members. New committee members will be appointed according to the guidelines of the USNC/IUGS constitution in early spring.

SOURCE OF FUNDING: NSF and USGS

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**COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
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Foreign Secretary, NAS

Dr. F. Sherwood Rowland

Chair, Board on Earth Sciences and Resources

Dr. Freeman Gilbert

Secretary, USNC/Geology

Dr. Paul Hearn

Secretary-General of 28th IGC

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COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

**U.S. NATIONAL COMMITTEE FOR THE
INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS
(USNC/IUGG)**

TASK: The purpose of the USNC/IUGG is to promote the advancement of geophysical sciences in the United States and throughout the world, and to effect participation of the U.S. scientific community in the activities of the International Union of Geodesy and Geophysics (IUGG) through the National Academy of Sciences-National Research Council, which is the U.S. adhering body to IUGG. The IUGG is comprised of seven international associations, including geodesy (IAG), geomagnetism and aeronomy (IAGA), hydrological sciences (IAHS), meteorology and atmospheric sciences (IAMAS), physical sciences of the oceans (IAPSO), seismology and physics of the earth's interior (IASPEI), and volcanology and chemistry of the earth's interior (IAVCEI).

Objectives and Operations: The USNC/IUGG plans and implements United States participation in the activities of the IUGG. The committee provides direct input to the IUGG through its President, Peter Wyllie (USA). It also keeps the U.S. scientific community informed of the activities of the IUGG. The committee nominates U.S. delegates to the General Assemblies and other Union and association meetings, and plans and sponsors meetings in the United States. The Committee also sponsors travel grant programs for scientists to attend IUGG meetings, noting that the selection of scientists to receive such assistance is one of the most important responsibilities of the USNC/IUGG. The USNC/IUGG works in cooperation with scientific societies, several of which are represented on the Committee.

The USNC/IUGG sponsors a quadrennial report on developments in geophysics. The report is compiled and published by the American Geophysical Union (AGU). The AGU plays a leading role in coordinating input of the professional societies to the USNC/IUGG and acts as secretariat of the committee. The committee usually meets twice a year in conjunction with the spring and fall meetings of the AGU.

CURRENT AND FUTURE ACTIVITIES:

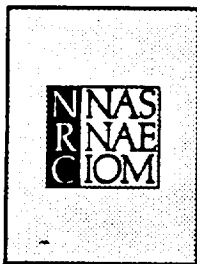
The USNC/IUGG met in December 1995 to evaluate its relationship with the AGU, nominate new committee members, and discuss a new constitution proposed by the NRC Office of International Affairs, which oversees the U.S. National Committees. Under the proposed guidelines of the constitution, the committee size would decrease, members would rotate off after 4 years, and membership would be chosen from a pool of nominations by professional societies, industry, and the broader scientific community. A year later, the new constitution was still not ready to be ratified, thus a new committee was appointed under the guidelines of the existing constitution. AGU will continue to support the secretarial functions of the committee.

The new committee will hold its first meeting in December 1996. It is anticipated that the meeting will focus on strategic planning for the committee as a whole and for the 7 association subcommittees, which meet at their own expense to deal with the affairs of U.S. scientific community in their respective disciplines.

SOURCE OF FUNDING: NSF

NRC STAFF: Anne M. Linn

Updated October 17, 1996



**COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES**

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Dr. David N. Schramm (6/97)

Chairman, Ocean Studies Board
TBD

Chairman, Polar Research Board
Dr. David Clark, (12/98)

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Dr. Claude R. Canizares (6/97)

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COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

**U.S. NATIONAL COMMITTEE FOR THE
INTERNATIONAL GEOGRAPHICAL UNION
(USNC/IGU)**

TASK: The purpose of the USNC/IGU is to promote the advancement of geography in the United States and throughout the world in cooperation with the professional geographical societies, and to effect participation of the U.S. scientific community in the activities of the International Geographical Union (IGU) through the National Academy of Sciences-National Research Council, which is the U.S. adhering body to IGU.

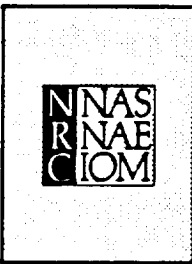
Objectives and Operations: The U.S. National Committee for the IGU plans and implements United States participation in the programs of IGU. In promoting international cooperation in geographical activities and corresponding national activities, the USNC/IGU plays an important coordination role among the academic, applied science, and federal organizations represented on the Committee. The Committee interacts with the IGU, the IGU Commissions and Working Groups, the geographical societies, and inter-union programs, such as the International Cartographic Association and the International Geosphere-Biosphere (Global Change) Program.

The committee normally meets twice a year—in the spring, in conjunction with the annual meeting of the Association of American Geographers, and in the fall in Washington, D.C. The next meeting of the committee is scheduled for November 3, 1996 in Washington, D.C.

CURRENT AND FUTURE ACTIVITIES: The committee is in the process of redrafting its constitution to conform with NRC policies for “regular” committees and will probably approve the new draft constitution at its meeting in November. The draft will be submitted to BESR, OIA, and the Governing Board in late 1996 or early 1997.

SOURCE OF FUNDING: NSF

NRC STAFF: Kevin D. Crowley



COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

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AD HOC ACTIVITIES

National Research Council

EARTHMAP FORUM

The goal of the Earthmap initiative is to enhance sustainable development decision-making through the appropriate use of geospatial data and tools, and to promote the adoption of a compatible framework for data collection, analysis, and use.

At the request of Tim Wirth, Under Secretary of State of Global Affairs, the NRC is in the process of establishing a mechanism for furthering the Earthmap initiative. The Executive Committee of the Governing Board has authorized the establishment of the Forum, which will be overseen by a "virtual" commission; the Forum will be an "independent" activity within the NRC with high-level input from most of the existing NRC entities including those representing activities within the geosciences, engineering, social sciences, sustainable development, and international relations. The Earthmap Forum will bring together leaders in government, industry, and academia to provide a focus for discussing issues related to the use of geospatial data in international sustainable development activities.

The Forum will be closely aligned with the Office of International Affairs (OIA) and their programs involving international science. For example, the its discussions will be reported to the appropriate national committees of ICSU and to the Inter-Academy Panel. OIA contacts with developing country scientists will also be used by the Forum.

Recent Activities

- Presentation of the Earthmap initiative (by Usselman) at a panel symposium on international spatial data activities at the Vienna Congress of the International Society of Photogrammetry and Remote Sensing (ISPRS).
- Participation at a workshop on Global Spatial Data Infrastructures, hosted by the European Commission in early September in Bonn.
- The USGS established a worldwide web site for Earthmap (<http://cdserver.er.usgs.gov>) and are preparing a CD for broad distribution.
- Lockheed-Martin reprinted the initial Earthmap Design study and distributed them at the Vienna ISPRS Congress; they also developed an Earthmap CD based on natural disaster response applications.
- The Earthmap initiative was discussed at the International Geological Congress (August 1996 in Beijing) with John Reinemund and associates from the Circum-Pacific Map Project carrying the message.

Project Support

Staff have been meeting with department and agency officials, industry leaders, and consortiums, non-governmental organizations, and international institutions to begin the arrangement of resources for the Forum's operations, which will hopefully begin in Fall 1996.

NRC Staff

Presently, the plans are for the Forum to be staffed by Thomas M. Usselman (BESR) with John Boright (Director of NRC's Office of International Affairs) or his designated staff.

COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES
COMMITTEE ON EARTH RESOURCES

**PANEL TO REVIEW THE MINERAL RESOURCE SURVEYS
PROGRAM OF THE U.S. GEOLOGICAL SURVEY**

TASK: At the request of the U.S. Geological Survey (USGS), the Committee on Earth Resources will establish a panel to provide a critical scientific evaluation of the agency's Mineral Resource Surveys Program (MRSP) plan. The 5-year plan, which was prepared in response to a directive from Congress, represents a significant departure from the past and reflects new priorities in the post-Cold War era. The panel will evaluate the plan in terms of the nation's long-term needs for minerals research and information, the completeness and balance of the program, and the scientific significance, credibility, and relevance of the overall program. It will provide recommendations as to how the National Plan could be modified to improve its effectiveness in meeting the long-term needs of the nation.

Panel members will have expertise in mitigation of environmental impacts related to extraction and use of mineral resources, as well as in genesis, assessment, exploration, and development of mineral resources. They will be drawn from industry, academia, government, and non-profit organizations.

CURRENT AND FUTURE ACTIVITIES

The panel operated on a fast-track schedule to complete its report in five months and provide timely advice for the USGS's fiscal year 1997 planning process. The panel held three meetings in three months, including briefings and discussions with approximately 50 representatives of federal and state agencies, policy groups, industry groups, and other resource experts. The panel's report, *Mineral Resources and Society: A Review of the U.S. Geological Survey's Mineral Resource Surveys Program Plan*, was delivered to the USGS on April 30, 1996.

A Congressional hearing on the report was convened by the House Resources Subcommittee on Energy and Mineral Resources on May 30, 1996. Samuel Adams testified in his capacity as chairman of the NRC panel that drafted the report, and another panel member, Jonathan Price, participated in his capacity as state geologist of Nevada. At the Congressional hearing, USGS Chief Geologist Patrick Leahy testified that the minerals program has already started to implement the major recommendations in the NRC report. The USGS has subsequently taken additional specific steps to implement the recommendations.

Panel chairman Samuel Adams and study director Craig Schiffries provided an in-depth briefing on the report to 70 MRSP projects chiefs, the largest gathering of such project chiefs in the program's history. They conducted additional briefings for the USGS Policy Council, and the Deputy Assistant Secretary of the Interior for Water and Science. They also met with the USGS team that is revising the five-year MRSP plan and responding to recommendations in the NRC report. Press coverage of the report and the Congressional hearing includes articles in scientific and trade journals.

SOURCES OF FUNDING: U.S. Geological Survey

NRC STAFF: Craig M. Schiffries



Commission on Geosciences, Environment, and Resources
Board on Earth Sciences and Resources
COMMITTEE ON EARTH RESOURCES

**Panel to Review the Mineral Resource Surveys Program
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COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES
COMMITTEE ON EARTH RESOURCES

**PANEL ON REVIEW OF THE OIL RECOVERY
DEMONSTRATION PROGRAM OF THE DEPARTMENT OF
ENERGY**

TASK: At the request of the Fossil Energy Office of the Department of Energy (DOE), a panel of the Committee on Earth Resources will be formed to evaluate the effectiveness of the Reservoir Class Field Demonstration Program and to recommend improvements. The committee will address issues such as program design, implementation strategy, funding adequacy, technology transfer capabilities, and appropriateness of the targeted audience in view of how well the Class Program provides support to the overall DOE petroleum research and development program.

The panel will meet five times over a period of 12 months to perform this assessment and will produce two reports: an interim letter report that addresses the effectiveness of the program will be developed during the first quarter of the project; a final report that fully addresses the charge to the committee will be issued at the end of the study.

CURRENT AND FUTURE ACTIVITIES

The panel issued an interim letter report less than four months after the study was initiated. The panel's final report, *Maintaining Oil Production from Marginal Fields: A Review of the Department of Energy's Reservoir Class Program*, was released on April 23, 1996, in conjunction with a meeting of the Board on Earth Sciences and Resources. On June 11, 1996, panel chairman Charles Groat gave a briefing on the report to the Congressional Oil and Gas Forum, a bipartisan coalition of Senators and Representatives interested in issues involving the U.S. oil and gas industry. The briefing, which was held in the U.S. Capitol building, was attended by about 15 Representatives, one Senator, and staffers representing several dozen congressional offices. The chairman also conducted a briefing at DOE headquarters, and a presentation at the annual meeting of the American Association of Petroleum Geologists is being planned. This report was featured on the Academy's web page, and in the NRC's *NewsReport*, a magazine about activities of the NRC. Press coverage of the report is anticipated in scientific and trade publications, and we have received inquiries from *Business Week* and other popular publications.

During the course of this study, the Department of Energy canceled Class 4 of the Reservoir Class Program in response to actions taken by Congress. The cancellation does not diminish the relevance or importance of the report, and DOE asked the panel to complete its work.

SOURCES OF FUNDING: Department of Energy

NRC STAFF: Craig M. Schiffries



COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES
COMMITTEE ON EARTH RESOURCES

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PROGRAM OF THE DEPARTMENT OF ENERGY

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COMMISSION ON GEOSCIENCES, ENVIRONMENT AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES
US GEODYNAMICS COMMITTEE

PANEL ON THE GEODYNAMICS OF SEDIMENTARY BASINS

TASK: This study will assess the opportunities for multi-disciplinary research by scientists in academia, government, and industry on the origin and evolution of sedimentary basins. Such research will lead to a better understanding of important but poorly understood geodynamic processes such as sea level change, crustal uplift, and mantle convection, and it will improve the ability to predict the distribution and extent of hydrocarbon, water, and certain mineral resources.

Sedimentary basins provide a recoverable record of vertical motions of the lithosphere through time. This record is preserved in the sedimentary basin fill, and it can be recovered by dating the time of deposition of the sediments and gauging within close limits their elevation with respect to sea level at the time of deposition. These data can be used to reconstruct changes in elevation of the surface of the lithosphere through time with an accuracy and precision unattainable from other data sets.

These processes reflect important but poorly understood global-scale geodynamic processes, such as sea level change, crustal uplift, and mantle convection. They also exert a strong control on the distribution of hydrocarbon, mineral, and water resources that are vital for industrial society.. Advances in understanding these geodynamic processes will lead to improvements in the ability to predict the distribution and extent of hydrocarbon provinces, sediment-hosted mineral deposits, and regional aquifers and their recharge areas.

This panel will meet two times during a 12-month study period to produce a short (approximately 25-page) report calling attention to opportunities for interdisciplinary research. In its report, the panel is charged to:

- (1) Identify scientifically important research problems that can be addressed by multi-disciplinary studies of sedimentary basins.
- (2) Identify new techniques and/or data sets that can be brought to bear on these problems.
- (3) Identify the cross-disciplinary ties that are essential to address these problems.

CURRENT AND FUTURE ACTIVITIES: The panel held its last meeting on November 4 in New Orleans. A draft report has been completed and reviewed. The report will be released when it is approved by the Commission on Geosciences, Environment, and Resources.

SOURCES OF FUNDING: DOE

NRC STAFF: Charles Meade

Updated October 18,1996

COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES
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GEODYNAMICS OF SEDIMENTARY BASINS PANEL

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**COMMISSION ON GEOSCIENCES, ENVIRONMENT AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES**

COMMITTEE ON EARTH GRAVITY FROM SPACE

TASK: At the request of NASA, a committee was formed to evaluate the potential for using satellite technologies to measure the time-varying component of the gravity field, and assess the utility of this data for addressing problems of interest to the earth science, natural hazards, and resource communities. The committee, which operates under the U.S. Geodynamics Committee, was asked to perform the following tasks:

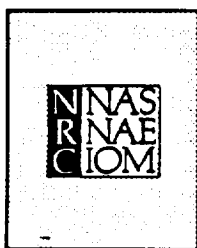
- compare the accuracy and resolution of gravity measurements from various satellite-based techniques;
- determine whether the quality and quantity of necessary ancillary data (i.e., topographic, magnetic, and altimetry data) are sufficient to obtain the time-varying gravity field from future satellite measurements; and
- assess the usefulness of both the static and time-varying components of the gravity field for addressing questions in the solid-earth, atmosphere, and ocean sciences.

CURRENT AND FUTURE ACTIVITIES:

A committee of 13 individuals with expertise in geodesy, solid-earth geophysics, satellite techniques, glaciology, marine geophysics, meteorology, hydrology, and oceanography met 4 times in 1996. As part of its work, the committee developed simple forward models to determine which earth processes would produce a gravity signal that could be detected from space. The committee has completed its work and is writing its final report. It is anticipated that the report will be ready for review in November or December.

SOURCES OF FUNDING: NASA

NRC STAFF: Anne Linn



**COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES
U.S. GEODYNAMICS COMMITTEE**

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COMMISSION ON GEOSCIENCES, ENVIRONMENT AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES
COMMITTEE ON SEISMOLOGY

**PANEL ON BASIC RESEARCH REQUIREMENTS IN SUPPORT
OF COMPREHENSIVE TEST BAN MONITORING**

TASK:

In response to written request from the Deputy Assistant Secretary of Defense for Atomic Energy, the panel to review the seismic programs of the Air Force was expanded evaluate the following:

1. What are the basic research problems remaining in the fields of seismology, hydroacoustics, infrasonics, and radionuclides that should be pursued to meet national and international requirements for nuclear monitoring? The panel's work on this question should anticipate quality of data to be made available in the future, in particular those data from the CTBT International Monitoring System.
2. What research is necessary to strengthen the synergy between the seismic, hydroacoustic, infrasonic, and radionuclide data sets to improve overall monitoring capability and to meet national and international requirements?
3. How should the research results be transitioned so that they are most useful to those responsible for monitoring and verifying a CTBT?
4. What are characteristics of a long-term program that would provide a stable, but adaptable base of support to those responsible for monitoring and verifying a CTBT?

The panel will prepare an interim and final report to the Deputy Assistant Secretary of Defense for Nuclear Monitoring.

CURRENT AND FUTURE ACTIVITIES: To address the above charge, the Air Force panel was expanded to include expertise from the disciplines of hydroacoustics, infrasound, and radionuclide monitoring. This expanded panel held its second meeting on October 8 and 9. Portions of the panel have traveled to Air Force Technical Applications Center for classified briefings on US test monitoring capabilities. The panel is working on its draft report. A final meeting to complete the report will be held in Irvine California in January 1997. The chair of the panel and the sponsor are convening a Union session on test ban monitoring at the Fall 1996 AGU.

SOURCE OF FUNDING: Department of Defense, Air Force Office of Scientific Research and the Phillips Laboratory.

NRC STAFF: Charles Meade

Updated October 18, 1996



Commission on Geosciences, Environment, and Resources
Board on Earth Sciences and Resources
COMMITTEE ON SEISMOLOGY

**Panel on Basic Research Requirements in Support
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COMMISSION ON GEOSCIENCES, ENVIRONMENT AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES
COMMITTEE ON SEISMOLOGY

PANEL ON SEISMIC HAZARD EVALUATION

TASK: This study, which was requested by the U.S. Nuclear Regulatory Commission (USNRC), will evaluate a new methodology for estimating probabilistic seismic hazards at nuclear power plants. The methodology has been developed by a Senior Seismic Hazard Analysis Committee (SSHAC) under the sponsorship of the Department of Energy (DOE), USNRC, and the Electric Power Research Institute (EPRI). The purpose of the SSHAC study is to determine the source of discrepancies between two hazard estimates and to derive a robust PSHA methodology for future estimates. The NRC panel study will evaluate the findings of the SSHAC report.

CURRENT AND FUTURE ACTIVITIES: The panel has met with the committee that is writing the SSHAC report and in March 1995 sent a letter report to the USNRC based on an initial draft of SSHAC findings. The panel has written its evaluation; the report has been reviewed and approved. It should be published by November 30, 1996.

SOURCES OF FUNDING: The Committee is currently being supported by: USNRC

NRC STAFF: William E. Benson

Updated October 17, 1996



COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

COMMITTEE ON SEISMOLOGY

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COMMISSION ON GEOSCIENCES, ENVIRONMENT AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

REDISCOVERING GEOGRAPHY COMMITTEE

TASK: The committee will perform a comprehensive assessment of the field of geography in the United States. The objectives of this assessment are to:

- Identify critical issues and constraints for the discipline of geography.
- Clarify priorities for teaching and research.
- Link developments in geography as a science with national needs for geography education.
- Increase the appreciation of geography within the scientific community.
- Communicate with the international scientific community about the future directions of the discipline in the United States.

The National Research Council — operating through the *Board on Earth Sciences and Resources* in collaboration with the *Commission on Behavioral and Social Sciences and Education* and the *Coordinating Council for Education* — has appointed a committee that represents the breadth of geography as a science. The committee will meet six times during an 18-month period to collect information, discuss issues, and prepare a written report of its recommendations. The committee is drawing on the individual expertise and experience of its members, the available scientific literature, and outside experts from geography and cognate fields in its deliberations.

CURRENT AND FUTURE ACTIVITIES: The report has cleared review and is now in preparation for publication. It will be published in late 1996 or early 1997.

SOURCES OF FUNDING: American Association of Geographers, Bureau of the Census, DOT, EPA, National Geographic Society, NSF, USGS.

NRC STAFF: Kevin D. Crowley

Updated August 14, 1996

Updated October 16, 1996



COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES

REDISCOVERING GEOGRAPHY COMMITTEE

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Commission on Geosciences, Environment and Resources
BOARD ON EARTH SCIENCES AND RESOURCES
WATER SCIENCE AND TECHNOLOGY BOARD

**“SEEING” INTO THE EARTH: NON-INVASIVE
CHARACTERIZATION OF THE SHALLOW
SUBSURFACE FOR ENVIRONMENTAL
AND ENGINEERING APPLICATIONS**

TASK

An expert multidisciplinary committee of 17 earth and physical scientists and engineers will focus on new and improved methods for characterizing the near-surface environment of the Earth. The committee will be charged to assess current capabilities for characterizing the near-surface environment using non-invasive technologies, to identify research and technology deficiencies, and to recommend R&D to fill these gaps. The committee will be encouraged to take a broad, long-term view that considers new and improved methods for relating indirect measurements to physical, chemical, and biological properties of the subsurface.

CURRENT ACTIVITIES:

The committee has held five meetings to date over the past 12 months. The most recent (late July 1996, in Golden, CO) focused on achieving consensus on the conclusions and recommendations of the report. The committee is now in the process of rewriting the report to be consistent with its consensus. The committee is aiming to have a reviewable draft report by about the end of the year. There are two meetings of opportunity in Denver to work on details of the draft - Friday-Saturday prior to the Geological Society of America meeting (Oct. 25-26) and Friday-Saturday prior to the Society of Exploration Geophysicists (Nov. 8-9).

One area of concern is the large gap between the state-of-the-science (technology) and the state-of-the-practice and the misuse of technology. Discussions of this gap may well be at the crux of any controversies associated with the report.

Report drafting has been facilitated using an experimental worldwide web discussion database that is password protected. Almost every member interactively inserted draft materials and/or commented on materials posted by other committee members. The committee cannot edit directly; document control is only by NRC staff. The committee has posted over 200 documents to the site.

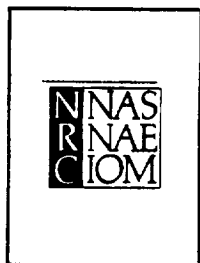
SOURCES OF FUNDING

National Academy of Sciences endowment funds.

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Updated October 21, 1996



NATIONAL ACADEMY OF SCIENCES/NATIONAL RESEARCH COUNCIL
COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES
WATER SCIENCE AND TECHNOLOGY BOARD

COMMITTEE FOR NON-INVASIVE CHARACTERIZATION OF THE
SHALLOW SUBSURFACE FOR ENVIRONMENTAL AND ENGINEERING
APPLICATIONS-1996

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COMMISSION ON GEOSCIENCES, ENVIRONMENT, AND RESOURCES
BOARD ON EARTH SCIENCES AND RESOURCES
BOARD ON NATURAL DISASTERS
THE SCIENCE OF EARTHQUAKES

TASK:

For this collaborative study with the Board on Natural Disasters, the committee will:

- (1) prepare a comprehensive summary of the multidisciplinary research throughout the earth and physical sciences on the origins, properties, and consequences of earthquakes, and
- (2) stimulate an ongoing exchange between a broad cross-section of scientists and users of earthquake information by sponsoring and organizing special forums on issues of earthquake science and mitigation at national meetings for scientific and engineering societies.

The product of the study will be a report that is intended to serve as a primary reference on the status of earthquake science and a summary of the study activities to enhance communication between earthquake scientists and engineers. Portions of the work will be targeted to (1) the wide range of scientists engaged in research on the properties and occurrence of earthquakes, (2) engineers and architects who require accurate and up-to-date information on the nature of seismic hazards, (3) policy makers at all levels of government who need to understand the technical foundations of earthquake science, and (4) concerned citizens who want to learn about the state of knowledge regarding seismic hazards.

CURRENT AND FUTURE ACTIVITIES: The committee held its second meeting in September 1996 in Washington DC. A third meeting will be held in March 1997 in Irvine, California. The committee has started to write its draft report. A special union symposium on earthquake science is scheduled for the Fall 1996 AGU.

SOURCES OF FUNDING: National Academy of Sciences endowment funds.

NRC STAFF: Charles Meade

Updated October 18, 1996



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**REPORTS OF THE
BOARD ON EARTH SCIENCES AND RESOURCES
1996**

Mineral Resources and Sustainability: Challenges for Earth Scientists, Committee on Earth Resources, Board on Earth Sciences and Resources, 1996.

Maintaining Oil Production from Marginal Fields: A Review of the Department of Energy's Reservoir Class Program, Panel on the Review of the Oil recovery Demonstration Program of the Department of Energy, Committee on Earth Resources, Board on Earth Sciences and Resources, 1996.

Mineral Resources and Society: A Review of the U.S. Geological Survey's Mineral Resource Surveys Program Plan, Panel to Review the Mineral Resource Surveys Program Plan of the U.S. Geological Survey, Committee on Earth Resources, Board on Earth Sciences and Resources, 1996.

Technical Issues in NOAA's Nautical Chart Program, Board on Earth Sciences and Resources and Marine Board, 1996.

High Performance Computing in Seismology, Committee on Seismology, Board on Earth Sciences and Resources, 1996.

Rock Fractures and Fluid Flow: Contemporary Understanding and Applications, Panel on Fracture Characterization and Fluid Flow, U.S. National Committee for Rock Mechanics, Board on Energy and Environmental Systems, Board on Earth Sciences and Resources, 1996.

