

Federal Advisory Committee  
*for the*  
U.S. Geological Survey  
National Cooperative Geologic Mapping Program  
*and*  
National Geological and Geophysical Data Preservation  
Program  
2009 Annual Report to the Secretary of the Interior

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## Executive Summary

As mandated by the National Geologic Mapping Act (NGMA) of 1992 (Public Law 102–285), and its reauthorizations of 1997, 1999, and 2009 (Public Laws 105–36, 106–148, and 111–11, respectively), the Federal Advisory Committee (FAC) for the National Cooperative Geologic Mapping Program (NCGMP) is required to submit a report to the Secretary of the Interior that evaluates progress made toward fulfilling the Federal, State, and educational components of the NGMA as well as an evaluation of the progress of the National Geological and Geophysical Data Preservation Program (NGGDPP) as established by the NGGDPP Act of 2005 (Public Law 109–58). This document fulfills these requirements for 2009.

The Federal Advisory Committee (FAC) deems the **National Cooperative Geologic Mapping Program** (NCGMP) to be progressing well. The NCGMP is effective in creating new geologic maps that provide the Nation with the scientific information to address a broad range of issues, including (1) reducing risks from natural hazards, (2) aiding in land-management and land-use decisions, (3) assessing water, energy, and mineral resources, (4) aiding in environmental and health concerns, and (5) furthering our scientific knowledge about Earth processes. The program also helps train the next generation of geologic mappers through its successful education component.

The program is authorized for \$64 million, and appropriations in FY 2009 were \$27.7 million. Despite its accomplishments, the program needs a substantial increase in funding to keep pace with the demand for new geologic maps and digital, geographic information system versions of previously published geologic maps and to more fully accomplish its mission:

“To provide accurate geologic maps and three-dimensional framework models that help to sustain and improve the quality of life and economic viability of the Nation through understanding ground-water availability and quality, supporting DOI land management decisions, mitigating hazards, assisting in ecological and climatic monitoring and modeling, and understanding onshore-offshore sediment processes.”

— NCGM Program Plan 2007-2011

The FAC deems the **National Geological and Geophysical Data Preservation Program** (NGGDPP) to be progressing well. Within resource constraints, the program has managed to (1) provide support to

State geological surveys to inventory collections of geological and geophysical data, (2) begin development of a National Digital Catalog of metadata that will allow users easily to discover and access geoscience data, (3) curate valuable paleontological samples, energy-related cores, and geophysical data, (4) assemble a white paper describing data preservation best practices, and (5) co-sponsor a workshop for State geological survey participants to share data preservation techniques, metadata creation strategies, and incorporation of State metadata information in the National Digital Catalog.

The program is authorized for \$30 million per year for 5 years. Appropriations in FY 2007 were \$175,000; FY 2008 appropriations were \$1 million; and FY 2009 appropriations were \$1 million. So far, the NCGDPP Financial and Technical Assistance (Grants) Program has awarded \$1,266,245 to State geological surveys.

The 2009 annual meeting of the Federal Advisory Committee (FAC) for the National Cooperative Geologic Mapping Program (NCGMP) and the National Geological and Geophysical Data Preservation Program (NGGDPP) took place May 12–13, 2009, at the West Virginia University (Brooks Hall, Room 324) in Morgantown, West Virginia. The meeting was held in conjunction with the 13<sup>th</sup> Annual Digital Mapping Techniques Workshop at the same local.

The FAC considered and provided recommendations on (1) technological advances in geologic mapping, (2) implications of the March 2009 reauthorization of the National Geologic Mapping Act, particularly FAC recommendations for new members and interpretation of language changes, (3) EDMAP funding and enhancing efforts in support of EDMAP students, (4) status of the National Geological and Geophysical Data Preservation Program, and (5) future actions for NCGMP and NGGDPP. The FAC is pleased that the USGS is responding to its previous recommendations for both programs. In particular, the FAC is pleased with progress on making EDMAP products more available and in improved coordination of the NCGMP with USGS water census efforts.

## National Cooperative Geologic Mapping Program

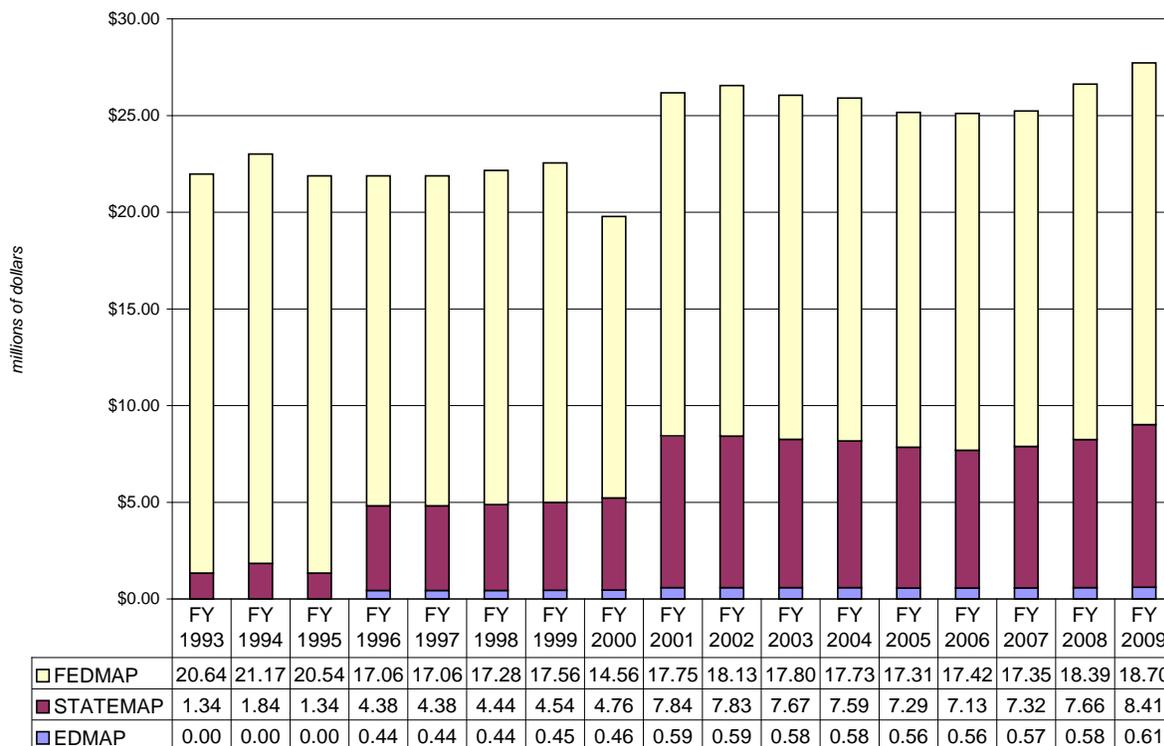
The NCGMP manages three components: (1) FEDMAP, to meet Federal priorities for geologic maps and basic geologic information about the country, (2) STATEMAP, to meet State needs in a cost-sharing partnership between the USGS and State geological surveys, and (3) EDMAP, to train the next generation of geologic mappers in a cost-sharing partnership between the USGS and colleges and universities in the United States. While the program has grown over the years, funding has been well below congressionally authorized levels and does not provide the resources to make significant improvements to domestic mapping efforts. The latest reauthorization of the NCGMP occurred on March 30, 2009, with passage of the Omnibus Public Lands Act (P.L. 111–11). Congressionally authorized funding for NCGMP has been:

Fiscal Year	1999	2000	2001	2002	2003	2004	2005-Present
(\$000)	28,000	30,000	37,000	43,000	50,000	57,000	64,000

Appropriated funding has been substantially below the authorized levels as the following table shows.

## NCGMP actual funding 1993 – 2009

Data updated May 2009



### NCGMP Accomplishments

In response to a FAC recommendation, the 2009 FAC meeting was held in conjunction with another meeting – the 13<sup>th</sup> Annual Digital Mapping Techniques (DMT) Workshop. This is the first time that the FAC was held with another meeting, and the FAC approves of the forum.

David Soller, Project Chief of the National Geologic Map Database, is the program's front line with partners and with States for building the national database and has run the popular DMT workshop that brings together about 90 geologic mapping technical experts from across the country each year. The community is very active, for example using a listserv to canvass the community in problem solving and to discuss database development and use issues. 2009 has been a good year for the project and the program with the release of the Federal Geographic Data Committee's "FGDC Digital Cartographic Standard for Geologic Map Symbolization," which took many years and considerable coordination and collaboration to produce. It is through the DMT community that the standards will be implemented. Of note, ESRI, a recognized industry leader in geographic information systems, is incorporating the standards in their well-known software, which will speed up implementation.

The NCGMP has seen a few growth spurts of approximately \$1 million each during the last 9 years. These increases have allowed the program to keep pace with inflation. With the change in administration, geologic mapping and data preservation have opportunities in alternative energy, climate, water; all of which touch on the programs for this FAC. In particular, the Water Census in the USGS Science Strategy is an opportunity. An opportunity for the EDMAP component lies in the Administration's focus on youth.

In January 2009, leaders from the USGS and Association of American State Geologists met in Golden, CO, to discuss principles relating to new monies coming to the NCGMP through new administration initiatives or State coalitions. After spirited discussion of options, the group agreed that the National

Geologic Mapping Act, with its proven track record over the past 17 years, is the best model for any increases for the program.

To address the issue of rising publications costs and with the aim of finding efficiencies in geologic map publications workflow, the NCGMP and the USGS publications customer advisory group initiated a bureau-wide dialogue on the future of geologic maps publishing. The program is taking a two-pronged approach to improving workflow: externally through the annual DMT and internally via periodic workshops involving scientists, editors, graphics specialists, and geographic information system technicians. The FAC commends the program for taking the initiative in improving timeliness and reducing costs for geologic map production.

At the DMT meeting, the program unveiled “NCGMP 09,” a new model for the database that improves metadata capture and data input. The data model was presented to the DMT community to initiate testing and analysis with the very folks who will most benefit and will have the most experience for improving the model.

**FEDMAP:** Potential new project areas for the FEDMAP component of the program include a focus on providing framework geologic mapping for climate change studies along the Platte River particularly in Nebraska. Work will be coordinated with the USGS Climate Change Program and regional partners and stakeholders. Another possible opportunity for growth is along the U.S.-Mexico border. The States of the region welcome the effort. Other areas of potential new starts include New England, Southern California, and Alaska. The program noted its philosophy of a mixed funding model for laboratories including a certain amount of core financial support that laboratory managers can depend on. For the balance of needed operational costs, the labs employ fee for service.

**STATEMAP:** For 2009, proposals were funded for 45 States. Of note, the quality of the maps continues to improve. Since 1993, \$81 million from the program has been matched by States. Item of concern: trends are that fewer States are able to provide a match for the funds they need because of the economic situation in individual States. Some States have expressed concern that they may not be able to spend award funds. At a certain point in the year, if funding is not used, monies are returned to the Treasury.

**EDMAP:** Success stories and issues for the EDMAP program:

- Following a FAC recommendation, the program now posts on the web, maps that are not published by States.
- Criteria for EDMAP proposal reviews: the EDMAP review panel suggested increasing the number of points awarded for professorial mentoring. The suggestion is to take 10 points from technical merit. The FAC concurs.
- Success rate of proposals funded has risen from about 50 to 70.
- The panel recommends an increase in award amount, which has been \$15,000 since 1996. The FAC concurs.
- The program is striving to increase minority participation, for example by working with GeoFORCE Texas, which strives “...to inspire and motivate students to continue into higher education in a geosciences degree track” and to reward “...outstanding students from select South Texas Independent School Districts and Houston schools from grades 8-12 with the chance to travel the country, meet inspiring people, and learn about opportunities for careers in the geosciences” (The Jackson School of Geosciences at The University of Texas at Austin at <http://www.jsq.utexas.edu/geoforce/what.html>). The program helped parents and students in underrepresented populations apply for college and scholarships.
- The program participates in the American Geological Institute group on workforce and student pipeline issues.
- The EDMAP program has reached a maturity such that in several cases, three generations of trained field mappers have been produced. That is, an EDMAP supported student has become a professor, received funding to train another student, who graduates, and in turn becomes a professor and trains yet another student.

From all three components, the program produces about 500 to 700 maps per year, 25-30 percent of which are surficial and 10 percent are digital compilations.

**Assessing Performance:** The Government Performance and Results Act performance measures for NCGMP provide a good assessment of the program's performance. Of note are three outcome measures:

- Percent of geologic investigations in National Park Service units that are cited for use by the National Park Service within three years of delivery,
- Percent of U.S. with geologic maps that are being integrated into ground-water availability status and trends to support resource management decisions, and
- Number of counties or comparable jurisdictions that have adopted hazard mitigation measures based in part on geologic mapping and research.

The program uses external sources to collect information related to these measures. Another measure of note is the efficiency measure: number of hours for fieldwork, compilation, and publication of a typical geologic map. The FAC anticipates the program's efforts to improve publications workflow will bear fruit, and the results will be evident in this measure.

To assess the success of the EDMAP component, since 2004 the program has tracked EDMAP students after they complete their project. Of the students surveyed, about 95 percent have gone on to work on a subsequent geoscience degree or have obtained a job in a geoscience field.

### **Changes in the 2009 Reauthorization of the National Geologic Mapping of 1992**

The Omnibus Public Land Management Act of 2009 contains the reauthorization of the National Geologic Mapping Act of 1992 (NGMA; P.L. 111–11, Section 11001). The Act —

- Adds an emphasis on the needs of the Department of the Interior bureaus. Sec. 31c(d)(1)B(ii)(III)
- To the membership of the FAC, adds a representative from the private sector and an ex officio member to be either "the Secretary of the Interior or a designee from a land management agency of the Department of the Interior" and removes an ex officio member, the Assistant to the President for Science and Technology. The FAC composition is now a total of 11 members: 6 ex officio Federal members and 5 members representing the Association of American State Geologists (2), the private sector (2), and academia (1). Sec. 31d(a) The recently renewed FAC Charter is being amended to reflect these changes.
- Adds: "The advisory committee shall ... provide a scientific overview of geologic maps (including maps of geologic-based hazards) used or disseminated by Federal agencies for regulation or land-use planning." Sec. 31d(b)(3)
- Adds "State" to the following language: all maps developed with funding provided by the National Cooperative Geologic Mapping Program, including under the Federal, State, and education components." Sec. 31f(a)
- Reauthorizes the NGMA for 10 years. Previous reauthorizations were for 5 years. Sec. 31h(a)
- Adjusts the funding percentages for the components. The State component is 50 percent of new funds (previously 48 percent), the education component is 4 percent (previously 2 percent), and the Federal component is 46 percent (previously 50 percent). Sec. 31h(b)

## National Geological and Geophysical Data Preservation Program

The National Geological and Geophysical Data Preservation Program (NGGDPP) was authorized in Section 351 of the Energy Policy Act of 2005 (Public Law 109-58, Sec. 351). Objectives of the program as outlined in the Act are to:

- (1) Archive geologic, geophysical, and engineering data, maps, well logs, and samples;
- (2) Provide a national catalog of such archival material; and
- (3) Provide technical and financial assistance related to the archival material.

The program offers the opportunity to inventory, archive, and preserve geologic and geophysical data collected by many organizations over the past 150 years. Section 351 of the Energy Policy Act directs the Secretary of the Interior, through the Director of the U.S. Geological Survey (USGS), "to carry out a National Geological and Geophysical Data Preservation Program" comprising "State agencies that elect to be part of the system and agencies within the Department of the Interior that maintain geological and geophysical data and samples." Section 351 also states that "the Secretary may not designate a State agency as a component of the data archive system unless that agency is the agency that acts as the geological survey in the State."

### NGGDPP Accomplishments in FY 2009:

- November 3, 2008, the first 22 pallets of Anvil Points oil shale core, weighing 44,000 lbs., arrived at the Core Research Center (CRC). Ultimately, 723 pallets of oil shale core from world-wide sources were delivered from the Anvil Points Experimental Mine.
- Data continue to be added to the paleontology database.
- Program staff are working with other land management agencies to manage paleontological sample location data to protect paleontological resources as a result of passage of the Paleontological Resource Preservation Act of FY 2009.
- A beta-test version of the National Digital Catalog (NDC) will be released summer of FY 2009. The NDC will make metadata for items in geological and geophysical collections available to the public.
- The Interagency Working Group on Scientific Collections report, "Scientific Collections: Mission-Critical Resources for Federal Science Agencies," was available on the web in early 2009. Another publication important to, but not an accomplishment of, the NGGDPP is the Interagency Working Group on Digital Data's report on "Harnessing the Power of Digital Data for Science and Society."
- Throughout the Nation the materials catalogued by the NGGDPP contributed to new exploration plays in oil, gas, and geothermal energy developments and also provided the basis for all site-based CO<sub>2</sub>-sequestration work. Although no new funding was provided to store materials, the work on cataloging and coordinating those collections has furthered their use for these purposes.

**Developing Best Practices:** In FY 2009, the program is working with States, industry, and the international community to develop data preservation best practices. Program staff compiled a white paper summarizing the state of best data preservation practices; organized a 2010 Geological Society of America session on "Geoinformatics Best Practices"; and collaborated with the Association of American State Geologists to co-sponsor a "Data Preservation Techniques Workshop" in summer 2009. The workshop promoted sharing methods for metadata creation and uploading and best management practices for data preservation, cataloging, and accessibility. The workshop also allowed program staff to interact directly with State representatives who write the project proposals and create metadata for the NDC.

**Grants Program Priorities and Accomplishments FY 2007 to FY 2009:** In FY 2007, program priorities were collections-level inventories. In FY 2008 and FY 2009, program priorities were to continue support for collections-level inventories and to support creation of metadata for individual items in collections for the NDC.

**In FY 2007**, 35 State geological surveys and 8 USGS Geology Discipline Science Centers received approx \$5,000 each to inventory collections.

**In FY 2008**, 34 States requested more than \$1 million in funding; \$541,000 was awarded to 28 States. Four USGS Geology Discipline Science Centers received funds for data preservation. State geological survey requests ranged from \$5,524 to \$60,000, averaging \$31,405. Awards ranged from \$5,000 to \$47,651, averaging \$19,347.

**In FY 2009**, 30 States requested more than \$795,000; \$549,875.97 was awarded to 29 States. For the first time, Arkansas and California participated. State geological survey requests ranged from \$10,866 to \$60,000, averaging \$26,504; awards ranged from \$2,000 to \$49,074, averaging \$18,742.

**FY 2010 program plans** are to merge the program funding cycle with the Federal fiscal year and may include limited expanded opportunities (depending on resources available) as outlined in the NGGDPP Implementation Plan.

**Five-year Plan:** NGGDPP will begin drafting a five-year plan to help set priorities for 2010 to 2015 at various funding scenarios. USGS will select a working group to draft the plan. This draft document will be reviewed by a subcommittee of the NCGMP FAC.

**Assessing Performance:** The program created new Activity Based Costing (ABC) measures for use starting in FY 2010. The program will move from reporting gigabytes of data stored to reporting the number of metadata records available through the National Digital Catalog. The number of metadata records available is a superior measure of the geological and geophysical data accessible than the previous metric.

**Reauthorization of the National Geological and Geophysical Data Preservation Program Act of 2005:** The only known change to reauthorization language will be to extend the term of authorization to 10 years, thus the new authorization would cover 2010 to 2020.

## Recommendations from 2009 Annual Meeting

*For the National Cooperative Geologic Mapping Program*

1. **EDMAP Component:** With an apparent trend in decreasing youth participation in outdoor activities in general and a decline in the availability of field camps across the country, the Committee recommends that the program explore a partial shift of EDMAP-funded projects from graduate to undergraduate project support. The Committee supports a broadening of the reach of the EDMAP component via mechanisms such as outreach and support for field camps. The program should identify if EDMAP should expand to support field camps and learn more from the field camp community how program contributes/involvement would help. The program should talk/meet with NSF (e.g., Research Experience for Undergraduates), the American Geological Institute, and with those EDMAP faculty sponsors that run field camps to initiate the conversation. The program should initiate conversation and present suggestions and options to the FAC.
2. **Follow up and next steps regarding future technologies:** In a digital world, the program is to continue to aggressively look for opportunities. In a future FAC meeting, the Committee recommends that the program (David Soller) and State representatives (target States not contributing to data base) give presentations on data base issues such as data base development, opportunities and impediments to moving to common formats, and external access to data. Also, future FAC meetings should be held in conjunction with appropriate other meetings such as the May 2009 FAC meeting held with the Digital Mapping Techniques Workshop.

*For the National Geological and Geophysical Data Preservation Program*

3. FAC panel members recommended that USGS raise the profile of NNGDPP within the agency and beyond. Currently, NNGDPP funding comes through the Energy Resources Program. Is the program visible in the 2010 Priorities and Budget? How can NNGDPP be included in the Department of the Interior's strategic plan? Panel members stressed the need for program champions on the Hill.
4. The program should identify higher-level success stories. For example, cores available through the USGS Core Research Center are useful in research on carbon sequestration (carbon capture and storage) studies. Collect examples from the States on how the data are used to construct "use stories" and "outcome statements."
5. FAC panel members asked why States and the Federal Government do not require copies of data from cores drilled on public lands. Can NCGMP FAC bring this question to Congress? The States and Federal Government can choose not to accession cores drilled on their lands. It was suggested to start with industries that use public lands. It seems some Federal land managing agencies require operators on public lands to share data while others do not. Can we make this standard practice? State and Federal governments should have right of first refusal for future cores, boreholes, and associated data from public lands.
6. The panel suggested NNGDPP hold future workshops with other professional meetings to increase State participation
7. Once the USGS NNGDPP draft five-year plan is available, the draft document should be referred to a FAC subcommittee to review.

## **Appendix — Participants of the 2009 NCGMP FAC Meeting**

- Timothy Miller, Chair, USGS Acting Associate Director for Geology
- Peter Lyttle, DFO, USGS National Cooperative Geologic Mapping Program (NCGMP) Program Coordinator
- Robert Marvinney, representative of Association of American State Geologists (AASG), Maine State Geologist
- Robert Silva, ex officio member, U.S. Department of Energy, Office of Oil and Natural Gas, Senior Policy Analyst
- J. Courtney Cloyd, ex officio nominee, U.S. Department of Agriculture, Forest Service, National Geology and Paleontology Program Manager
- Peter Scholle, nominee, representative of AASG, New Mexico State Geologist
- David Weary, speaker, USGS Earth Surface Processes Science Center Scientist
- Betty Adrian, speaker, National Geological and Geophysical Data Preservation Program (NGGDPP) Associate Program Coordinator
- Frances Pierce, speaker, NGGDPP, Grant Program Manager
- Randal Orndorff, speaker, NCGMP Associate Program Coordinator, Grants Administrator
- Linda Jacobsen, speaker, NCGMP Associate Program Coordinator

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