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Position Summary. The Geological Society of America (GSA) strongly supports open access to scientific data to promote advancement in research, support education, and improve the economic progress, health, and welfare of society.

This position statement provides a communication tool that summarizes the consensus view of GSA on issues related to access to scientific data and encourages public agencies and the private sector to make data available to the greatest extent possible.

CONCLUSIONS AND RECOMMENDATIONS

- Clearly communicate the requirement for open data access and the value of scientific data access, including direct communication to the heads of agencies (federal, state, and local) and institutions that fund acquisition, storage, and dissemination of geoscience data;
- Encourage all members of the Society to promote open access to data in their respective communities, institutions, and countries;
- Support digital data banks and continue to keep abreast of new methods and forums for providing data to the scientific community;
- Promote dialogs with scientific publishers to ensure that the fullest access to data is provided, while ensuring scientific data integrity;
- Regularly reexamine the classification of restricted or proprietary data to determine if a status change is appropriate;
- Monitor pending legislation dealing with scientific data and offer to provide testimony consistent with this position, as appropriate; and
- Encourage archival of geological data; see www.geosociety.org/gsa/positions/position9.aspx.

RATIONALE

Data provide a factual base to decision makers involved in environmental, natural resource, global change, hazards, and other science-based issues. GSA supports open access to the full spectra of scientific data, including derived data products, to support critical research, education, and decision making. Geoscience data are concerned with the solid Earth, atmosphere, hydrosphere, cryosphere, and biosphere, both in the present and throughout Earth history. They pertain to diverse, societally relevant topics, such as weather, climate and paleoclimate, water quality and availability, extinction and evolution, geologic hazards (e.g., earthquakes and volcanic hazards), and earth resources, which have economic and strategic importance. These data are also prerequisite for practicing open scientific inquiry, conducting the next generation of earth-science research, and providing the basis for the continued improvement of earth-science education. In addition, open access to and synthesis of these data for public use are important for building a broader public awareness of the importance of science to society. The scientific process runs on data; full access to both new and historical data supports scientific advances and contributes to science education—both provide the groundwork for the economic progress, health, and welfare of society. Despite this underlying importance, access to scientific data is not always “open” and readily available to the public, and when datasets become available, there is often a significant lag between data gathering, analysis, and full public dissemination, which can impact their usefulness for public benefit and decision making when time-critical data are involved. Access to some scientific data is justifiably restricted for a variety of reasons (e.g.,

proprietary or confidential information or national security concerns). The majority of scientific data collected with public funds, however, is not constrained by these restrictions, and much of the data generated by private funds could be made openly available. In addition, physical samples, such as fossils, minerals, rocks, and ice cores collected from commonly inaccessible locations (deep drill holes, excavations, the seafloor, polar settings, the Moon, etc.) are valuable components of geoscience data. GSA supports efforts to preserve and archive physical samples in museums, universities, government agencies, and other repositories and to make these samples and their associated data readily available to both the research community and the public.

Many government agencies financially support the acquisition of scientific data by researchers in their own agencies as well as in other government agencies, academia, and the private sector. Some of these data may become available through publications in the scientific literature, but the raw and processed data and metadata should be readily accessible for further analysis. Federal funding agencies are increasingly requiring that data generated through the use of public funds be archived in query-able and publicly accessible databases without significant delays between acquisition and archiving, and GSA endorses this practice. Publication of peer-reviewed scientific results and interpretations is a cornerstone of science; however, the data that underlie these publications should be openly accessible after peer review and publication.

GSA encourages public agencies and professional societies to adopt policies and data management practices that make unclassified data discoverable, accessible, verifiable, trustworthy, and usable by the public. Whenever feasible, these data should (1) be available digitally, (2) follow established standards for classifying and archiving data, (3) provide metadata to enable use and credit parties responsible for their creation, and (4) be structured in a way to enable accessibility and sharing among specialists and non-specialists. GSA also encourages the private sector, when possible, to make scientific data available at no charge to educators and scientific researchers for use in research and public forums, including lectures and peer-reviewed scientific literature. While it is important to maintain the copyright status of publications involving analysis and interpretation of data, the development of seamless links among peer-reviewed publications and public databases must be pursued so that the data are openly available without user fees.

GSA recognizes that building and maintaining open access to scientific data are shared responsibilities among researchers, public and private institutions, and government agencies. Academic institutions need to fully recognize the economic and societal value inherent in the development and maintenance of geologic data sets and repositories as well as individual scholarship and scientific merit. GSA maintains a position statement on [Geoscience Data Preservation](#).

Other national and international organizations have made recommendations regarding access to scientific data, including the National Research Council, the American Geophysical Union, the International Union of Geological Sciences, the International Council for Science, the U.S. Global Change Research Program, the World Meteorological Organization, the Intergovernmental Oceanographic Commission of UNESCO, the World Climate Program, the Committee on Earth Observations–Satellites, the International Earth Observing System, and the Global Climate Observing System. GSA's position is consistent with these organizations' recommendations. GSA supports the continued efforts of the National Science Foundation, the U.S. Geological Survey, the U.S. Department of Energy, the Association of American State Geologists, and other federal and state agencies to make data broadly available.

Only through open access to data and derived data products can we maximize the stewardship of Earth's resources and environment. Consequently, GSA supports laws, regulations, funding, policies, and institutions that allow the preservation and enhancement of open access to the full suite of unclassified science data while preserving the economic viability of the entities that generate and publish data and the analyses and interpretations based on these data.

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ABOUT THE GEOLOGICAL SOCIETY OF AMERICA

The Geological Society of America unites a diverse community of geoscientists in a common purpose to study the mysteries of our planet (and beyond) and share scientific findings. Members and friends around the world, from academia, government, and industry, participate in GSA meetings, publications, and programs at all career levels, to foster professional excellence. GSA values and supports inclusion through cooperative research, public dialogue on earth issues, science education, and the application of geoscience in the service of humankind.

OPPORTUNITIES FOR GSA AND ITS MEMBERS TO HELP IMPLEMENT RECOMMENDATIONS

- GSA members should identify circumstances where data and metadata developed by public agencies could be made reasonably accessible to the scientific community for research and supporting public-policy decision making; members should make GSA's Geology and Public Policy Committee, Geology and Society Division, and Director for Geoscience Policy aware of their findings.
- GSA members can use this position statement to persuade the gatekeepers of unreleased science data to release those data for future research and for consideration in public-policy development.
- GSA members can seek opportunities to serve and share data and stay abreast of new methods and forums for providing data to the scientific community.

GSA members should support open data access in educational settings, informing new generations of earth scientists of the value of sharing and using new and historical scientific data.