
Promoting Earth Science Literacy for Public Decision Making

Position Statement. The Geological Society of America (GSA) recognizes the critical need for citizens and policy makers to understand important aspects of the Earth system as they face issues related to natural resources, energy, natural hazards, and human impacts on the environment. GSA supports the active involvement of geoscientists and geoscience educators in helping to improve the knowledge and understanding of the geosciences among members of the general public in order to support informed decision making by Earth's citizens and communities. GSA and GSA members should contribute to education and outreach about fundamental concepts of Earth science, issues related to long-term human sustainability on Earth (such as the use and availability of water, minerals, and energy resources), and socially prominent topics (such as climate change and natural hazards preparedness).

RATIONALE

For most people, formal education in the geosciences is often minimal. Once an individual has his or her last experience in formal Earth science education, perhaps in middle school, updating their knowledge with new information becomes difficult. People may not understand the relevance of the geosciences to their lives, either in the short or long term. Most citizens are not aware that they access and use geoscience information when they attend to news about the weather and natural hazards or use computer-based visualization tools that display Earth data sets.

The U.S. National Research Council has recommended, and the National Science Foundation has mandated, that scientists effectively disseminate the outcomes of their research. This obligation comes not only from the fiscal responsibility of the scientists to the public who paid for the research, but also from the public's need for information and knowledge with which to make informed decisions. Communications must go beyond the scholarly dissemination of scientific research results and place the scientific insights into the context of locally relevant and societally important issues that individuals and communities need to address.

A healthy democracy, or any representative or direct-election form of government, relies upon an informed and educated citizenry to guide the country. This need becomes greater or intensifies as populations increase, resources become more scarce, the social and economic impacts from natural hazards increase, and human impacts on the environment increase. However, making informed choices about energy and natural resources, preparing for natural hazards, and mitigating and adapting to climate change requires an understanding of geoscience processes and timescales. An informed and educated citizenry can guide decision makers as they develop regulations through the legislative and rulemaking process and put in place infrastructures that can protect citizens and communities, safeguard the environment, ensure access to energy, and preserve natural resources.

RECOMMENDATIONS

Geoscientists are encouraged to

- Consider their work in the context of its relevance for addressing societal problems, and, if appropriate, identify key elements of their work for public and educational outlets;

- Seek to improve the perceived relevance of the geosciences by the public and the public's understanding of Earth and the environment across all aspects of geosciences, but with particular attention to natural resources, energy, natural hazards, and impact on the environment by individuals and communities; and
- Use various avenues to achieve these ends, including formal and informal education, communication with the public through mainstream media, web pages, blogs and wikis, social media, and other types of professional outreach, including interviews, museum displays, and workshops with teachers, schools, and governmental, organizational, and social programs.

Employers of geoscientists and geoscience educators are encouraged to

- Support geoscience education and outreach by providing employees with the tools and training for public engagement and fostering partnerships with professional outreach organizations; and
- Provide formal recognition of their employees' efforts to increase public understanding of Earth and the environment by rewarding these activities with favorable salary and promotion decisions and with company/organization staff awards.

Educators of future geoscientists are encouraged to

- Weave opportunities for actual or simulated public engagement into the formal curriculum for future geoscientists; and
- Provide knowledge, skills, mentoring, contacts, and internships for undergraduate and graduate students relevant to careers in which they will use their geoscience expertise to address societal issues.

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ABOUT THE GEOLOGICAL SOCIETY OF AMERICA

The Geological Society of America (GSA), is a global professional society with more than 24,000 members from academia, government, and industry in more than 100 countries. Through meetings, publications, and programs, GSA enhances the professional growth of earth scientists and promotes the geosciences in the service of humankind. GSA encourages cooperative research and shared findings among earth, life, planetary, and social scientists, fosters public dialogue on geoscience issues, and supports all levels of earth science education. Inquiries about GSA or this position statement should be directed to GSA's Director for Geoscience Policy, Kasey S. White, at +1-202-669-0466 or kwhite@geosociety.org.

OPPORTUNITIES FOR GSA AND GSA MEMBERS TO HELP IMPLEMENT RECOMMENDATIONS

GSA members can

- Lead or participate in geoscience workshops and other geoscience engagement activities for or by non-science experts, including citizens, community organizations, professionals, and policy makers, whose efforts affect and are affected by the geosciences;
- Participate in discussions that address societal issues or problems to help inform the discussion from a geoscience perspective and contribute to solutions;
- Communicate with their elected officials about issues for which geoscience can provide support—either through informing decisions or by providing solutions;
- Identify legislation that can be informed by the geosciences and alert GSA’s Geology and Public Policy Committee, GSA’s Geology and Society Division, and the GSA Associated Societies if action by GSA and its membership might positively contribute to that legislation;
- Participate in Congressional Visits Day with GSA to help educate members of Congress and their staff;
- Attend public hearings and participate in discussions that address societal issues or problems; and
- Submit comments to administrative entities in the rulemaking process at local, state, federal levels.

The Geological Society of America can

- Support geoscience education and outreach by providing GSA members with tools and training for public engagement and fostering partnerships with professional outreach organizations;
- Provide avenues to enable collective or individual actions through GSA Committees and Divisions and through organizations with which GSA is affiliated;
- Publish and publicize successful examples of initiatives that have increased public understanding of Earth and the environment and of societal decisions that have benefited from geoscience input;
- Encourage academic institutions to value and reward in a concrete way faculty and staff activities that improve understanding of the geosciences;
- Support earth science education at community and technical colleges.
- Identify experts to speak and engage with the media, legislators, and other stakeholders on geoscience topics that have ramifications for societal issues;
- Identify legislation that can be informed by the geosciences and pursue avenues to effectively and positively affect that legislation;
- Support changes to pre-college curricula to include a year of Earth-science education at both the middle school and high school levels, as advocated by the National Research Council’s *Framework for K–12 Science Education and the Next Generation Science Standards*; and
- Support this effort by addressing the recommendations from the GSA position statements, including *The Importance of Teaching Earth Science*; *Expanding and Improving Geoscience in Higher Education*; and *Rewarding Professional Contributions*.