



IMPORTANCE AND FUTURE ROLES OF STATE GEOLOGICAL SURVEYS

**By A Committee of Members
of the American Institute of Professional Geologists**

State geological surveys are vitally important to the economy of each state and to the nation. The information they collect and disseminate is used by other state agencies, by consultants, industry, developers, and the public as critical input in local and regional economic development plans, resulting in an economic advantage to the state. The information is essential for the responsible and sustainable development of a state's mineral, energy, and water resources, safe development and modernization of infrastructure, protecting the public from losses due to geologic and natural hazards or anthropogenic hazards, and the wise use of the state's natural resources for tourism and recreation. All of these are significant to the economy of the state and to the nation by providing jobs and various revenues, preventing or minimizing loss due to hazards and natural disasters, and by increasing our understanding of the earth's resources and the need for sustainable use.

The American Institute of Professional Geologists (AIPG) formed a special committee to evaluate the importance of state geological surveys in today's world and the future roles of the surveys. The committee included AIPG members who are familiar with and often work with the surveys. The committee members researched each geological survey, interviewed the State Geologists (the directors of the surveys), and reviewed guidance statements, organizational structure, programs, funding levels and staff roles of the surveys across the country. The committee concluded that state geological surveys provide critical functions in a cost effective manner that greatly enhances each state's economy and environment. The surveys provide the public and private sectors considerable support on all types of important environmental and natural resource issues. Continued support of our state geological surveys is critical since the services they provide are invaluable.

The state geological surveys serve our country in a significant role by providing unbiased and sound scientific research, geologic data and maps, and reports to the public, industry, academia, government agencies as well as local, municipal, county, state, and federal legislators and regulators. The responsibilities of the surveys vary somewhat from state to state, depending upon the enabling legislation, the specific needs of each state and the traditions under which each survey evolved. A thorough understanding of the state's geology is required to make informed decisions pertaining to the state and regional energy, water, mineral and land resources and to make this information available to the public. In many cases the longevity of a particular survey has allowed it to become the state's most valuable source of information on natural resource issues. Some surveys were established well over 150 years ago and others are approaching 70 to 80 years of existence. State geological surveys continue to be a critical resource for the nation.

About one-third of the state geological surveys function under a state university system while the other two-thirds operate as part of state government, either as a stand alone agency or as part of a larger state governmental entity. Most state surveys are non-regulatory whereas some have enforcement duties. All provide data and information in support of other agencies that have regulatory responsibilities particularly with regard to public health and safety including mineral resource development, oil and gas exploration, dam safety, utilities siting and design, waste disposal facility siting and design, investigation and remediation of contaminated sites, and water well drilling. State surveys also serve as repositories for important geologic information and



specimens such as geophysical data logs and rock core. These type of data repositories save the private sector millions of dollars in exploratory costs each year. Review of properly catalogued and archived rock core allows consultants, academia, and other public agency resource specialists and scientists to better understand the subsurface conditions at a site by using previously obtained resource information and reducing the need to obtain costly and perhaps redundant samples.

The surveys are managed and staffed by geologists, hydrogeologists, geophysicists, hydrologists, engineering geologists, GIS and spatial analysts, and other earth sciences professionals that have extensive knowledge of the earth's natural resources in their states and surrounding region. These highly trained and qualified individuals play an important role in conducting geologic, hydrologic, and geologic hazards investigations and providing services that may be used to advise, inform, and educate stakeholders about the importance of earth sciences in public policy decisions. The surveys also provide outreach to the public, local government, state agencies, federal agencies, and industry; stimulate research, study, and activities in the earth sciences by supporting K-12 and university level education; and share expertise by participation in professional organizations and at conferences.

In the past, surveys conducted geologic mapping, often in support of mineral resource development. Today, in addition to traditional mapping and data collection, the surveys provide much broader services focusing on human health, the environment, natural geologic hazards and anthropogenic hazards, energy and mineral resources, water resources, land-use planning, agriculture, economic development, education, earth resources development, climate change, sustainability, public policy support, and tourism and recreation. A current trend is toward providing all data and reports in a digital format as well as accessing the archives of older reports and making them available in a digital format. This digital format has increased the value of the surveys by providing easier accessibility to geologic data and information to the public, state, and federal agencies.

The surveys develop and provide an array of publications for the general public as well as strong technical reports and data collections that are used by geologists and other earth science professionals in public agencies and private industry. Typical environmental and geological hazard reporting and mapping projects may include hazard zone maps for earthquakes, tsunamis, landslides, rock fall and other slope failure, sink holes, areas with accelerated soil erosion and other adverse soil conditions, land subsidence and earth fissures, volcanic activity, areas prone to flash flooding and debris flows, shoreline and stream erosion, geomagnetic storms, avalanche zones, radon, arsenic, and other local hazards. These reports and maps may be used to identify, inventory, assess, and mitigate geologic and subsurface environmental hazards to promote safe and responsible land use, and to facilitate emergency preparedness. Other important studies include identification of natural resources such as oil, natural gas, coal, geothermal energy, mineral resources, water resources (including conditions related to water quality and quantity), subsurface storage of CO₂, hydraulic fracturing associated with shale gas extraction, and the need for alternative energy. It is critical to have a thorough understanding of these resources and their related geological settings for environmentally safe, economic, and sustainable development.

The surveys regularly provide staff and technical resource support to other state agencies. Cooperative programs with other state surveys and federal agencies add to the value of information from each survey. The surveys routinely assist the consulting community, industry, other local, state and federal agencies, to create the best solutions and at an economic benefit



from shared professional knowledge and cooperative work. Most state geological surveys actively participate in federally-sponsored programs that lead to a better and more comprehensive understanding of the geology and subsurface resources of our nation.

The survey's designated leaders are the State Geologists, who coordinate nationally through the Association of American State Geologists (AASG). This group shares ideas, issues and projects that enhance the group's ability to better serve our nation. The state geologists often work closely with their state legislators as well as with members of the United States Congress to provide advice on how legislation may affect natural resources, the environment, and geologic hazards. As an example, AASG is taking the lead role in exploring America's geothermal energy potential through an \$18 million grant issued by the US Department of Energy (DOE) to develop a National Geothermal Data System (NGDS). Each state geological survey is involved in compiling, digitizing, and documenting their existing data for populating the NGDS in a coordinated effort that can be easily referenced to evaluate an area's geothermal potential. Private industry is also involved in this project, which will lead to new software and database resources of great future value for many public and private sectors. Most state geological surveys participate in the US Geological Survey (USGS) Federal Cooperative Mapping Program, part of the National Geologic Mapping Act of 1992, which funds quadrangle mapping either through the STATEMAP or EDMAP programs. Each participating survey prepares geologic maps in an ongoing effort to map the entire United States on a statewide basis at a scale that is consistent and of the quality and detail to also be used to compile seamless digital maps for the entire country. State geological surveys also participate in the Geosciences Information Network (GIN) which links databases in the US state geological surveys (through AASG) and the USGS geology, geography, water, and biology databases. Cooperative programs such as these allow the state geological surveys to provide more useful maps, data sets, and reports and with a greater economic value.

The surveys contribute important data to the USGS and other federal agencies to compile assessments of minerals, energy, alternative energy, water, natural hazards, and other resources and information that are important to our nation. Mineral and water resource data submitted to USGS on a state basis are highly valuable to the USGS in evaluating known and potential resources and mining trends (quantity, quality, and projections).

The AIPG committee strongly supports the state geological surveys. The committee advises against neglect or termination of any of the primary state survey functions and highly recommends continued and even greater support for the long term and broad-reaching benefits afforded by the services of the surveys. It is vitally important that the surveys continue their efforts to conduct their work relevant to the issues of today and the future, to provide basic data and continue to map the geology and resources of each state, to continue the trend of providing information in a digital format, and to continue to work on cooperatively-funded projects, especially for those issues that are of value to each state and the entire nation. It is essential to maintain these valuable programs that are important to the public health and safety, to the environment and sustaining our resources, and the overall economy of each state and the nation.

Our nation's state geological surveys serve a fundamental role in resolving many of the important issues facing our world today and in the future. Continued support of our state geological surveys is critical. Each state is fortunate to have a resource such as its state geological survey.