SCIENCE

> *"Human subtlety .... will never devise an invention more beautiful, more simple or more direct than does nature, because in her inventions nothing is lacking, nothing is superfluous."*
>
> Leonardo da Vinci (1452-1519)

One of the highest priorities of the Department is performing critical science in the national interest. Whether it's conducting discrete water quality assessments that add up to a broad understanding of our Nation's drinking supply, seismic monitoring of the earth to better understand past earthquakes and warn of future ones, or building an understanding of the population and health of migrating waterfowl for use by wildlife managers nationwide, the Department carries out some of today's most vital scientific research, research that directly affects and impacts the health and welfare of the American people.

The Department's science bureaus -- the U.S. Geological Survey, the National Biological Service and the U.S. Bureau of Mines -- are premier organizations that respond to natural hazards, understand the complex biodiversity of the Nation's fish and wildlife, and find new ways to treat past abuses of public lands in terms of hazardous wastes. These bureaus do not have land management or regulatory responsibilities. It is precisely because of this that they are able to provide objective earth science and biological information from an unbiased, national perspective -- information that is trusted and depended upon by decision makers in the private and public sectors. Rigorously established standards are consistently applied to the generation of data, including both sample collection and analysis. The data are well maintained in easily accessible data bases.

EARTH SCIENCE

At the U.S. Geological Survey (USGS), earth science assessments are conducted by highly qualified scientists, based on the best data and scientific information possible. Research by the Geological Survey focuses on continually improving our scientific understanding, and extensive data collection helps to improve assessment reliability. The Geological Survey maintains data bases for information about the whole of the United States, and in some cases, the world. The Geological Survey also provides regional perspectives that are necessary for helping address land management and regulatory decisions on complex long-term issues that cross political boundaries.

It only took 10 to 20 seconds of strong ground shaking on January 17, 1994, to collapse buildings, bring down freeway interchanges, and rupture gas lines in the Los Angeles area. The Northridge earthquake, although moderate in size, caused about $30 billion in damage; but


Los Angeles Times

3 Die, Many Hurt in 6.6 Quak

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Los Angeles Times article on the Northridge earthquake. Photo credit - U.S. Geological Survey.

USGS water quality study on the Upper Mississippi River. Photo credit - U.S. Geological Survey.

damage could have been much worse. The Geological Survey activities to record regional earthquake patterns, map the geology of the Los Angeles basin, and calculate the strength of future ground motions formed the basis in southern California for some of the country's most stringent building codes.

Earth science information produced by the Geological Survey is readily available to individuals, industry, and Federal, State, and local agencies at no cost other than the cost of printing and distribution. This earth science information includes interpretive reports, maps of many kinds, data bases, and specialized products, many of which are based on long-term monitoring efforts. The Geological Survey earth science information is of greatest use to the Nation when the information is disseminated to and used by the greatest number of customers.

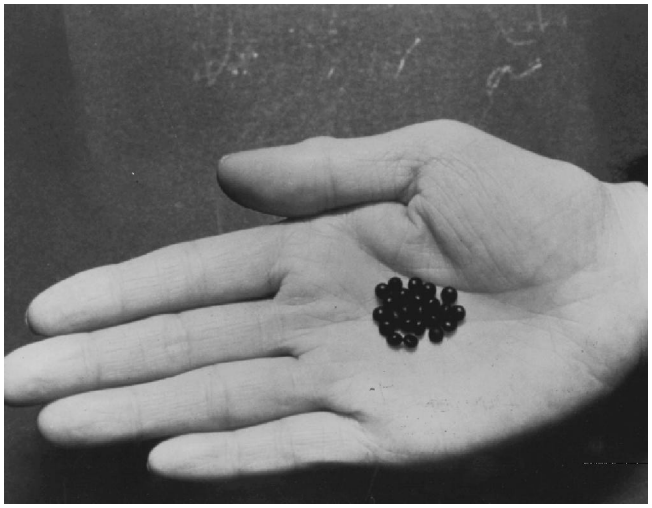
BIOLOGICAL SCIENCE

The National Biological Service (NBS) provides research and other biological data support to all Interior bureaus, States, and other Federal agencies. The creation of the National Biological Service in 1993 responded to the need for sound, objective biological data to support the host of day-to-day decisions made by Federal, State, local, and private resource managers.

Up-front information dealing with integrated regional issues, not single species or jurisdictions, is needed to avoid "train wrecks" -- situations where problems go unnoticed, or unaddressed, until both ecological and economic disruption is all but inevitable. Integrating the Department's biological science expertise in a single, non-regulatory agency enables Biological Service scientists to provide objective input to complex debates, without raising questions of motive or influence.

For example, the Biological Service offers the best scientific advice on waterfowl populations. The Biological Service scientists are experts in population monitoring, data management, reproductive and nesting success, effects of predators, habitat restoration, and wildlife disease. These experts can -- and do -- apply this expertise across the United States, as well as Canada and Mexico, where many ducks and geese breed and winter. State, Federal, and international waterfowl managers use this critical science, knowing that the Biological Service has no stake in a particular management decision. But it is citizens -- including both hunters and bird watchers -- who benefit from healthy flights of migratory waterfowl.

Computer landscape analysis at Glacier National Park fiel d station. Photo credit - National Biological Service.



Help from nature. U.S. Bureau of Mines scientists developed these tiny, porous beads made from peat moss and polymers to extract metal ions from waste water. Photo credit - USBM.

RESEARCH IN HEALTH AND SAFETY

After 85 years of invaluable service, the U.S. Bureau of Mines (USBM) will close in early 1996. Over the years, the Bureau of Mines contributed to the economic, military, and industrial strength of our country through improved mining methods and equipment, less expensive refining, and innovative metallurgical technologies. Other work in explosives, robotics, armor, and rescue equipment has benefited national defense and non-mining industries and applications. Because of Bureau of Mines research, energ and mineral resources have become steadily less expensive to obtain and use at the same time that the health and safety of the Nation's miners has improved.

As environmental concerns increased, the Bureau of Mines applied its expertise to mine-related problems and developed improved mine reclamation and remediation technologies, constructed wetlands to mitigate acid mine drainage, and found ways to remove selenium, arsenic, and lead from polluted waters. The Bureau has assisted the land management agencies in dealing with abandoned mines and mineral processing sites, helped the Department of Defense remove lead from soils around firing ranges, and helped the Department of Energy find new ways to deal with massive waste storage problems.

The USBM collected, analyzed, and disseminated information about the mining and processing of more than 100 mineral commodities across the Nation and in more than 185 countries around the world. Photo credit - USBM.

Some of the Bureau of Mines' health and safety activities will transfer to the Department of Energy, and some of the information and analysis activities will transfer to the U.S. Geological Survey and the Bureau of Land Management. However, almost $100 million of the Bureau's 1995 programs and activities will be terminated, and over 1,000 of its employees will be separated.

The employees of the Bureau of Mines have every reason to be very proud of their agency's 85 years of service to our country. The outstanding work and accomplishments of the employees of the Bureau of Mines will continue to benefit the nation long after the doors of the Bureau are closed.