

**Kentucky Geological Survey
Strategic Plan
December 2003**

**Research
University of Kentucky**



Earth Resources—Our Common Wealth

KGS Vision

We aspire to enhance the stature of the Kentucky Geological Survey (KGS) as one of the leading state geological surveys in the Nation: an institution recognized nationally and internationally for excellence in research and public service in mineral resources, fossil fuels, water, geologic hazards, and the environment.

Mission

First established in 1838, the Kentucky Geological Survey has investigated the mineral, energy, and water resources, and geologic hazards, of Kentucky for 165 years. As the official geologic research organization for the Commonwealth of Kentucky, our mission is focused on research and public service.

- ❖ Our mission is to increase knowledge and understanding of the mineral, energy, and water resources, geologic hazards, and geology of Kentucky for the benefit of the Commonwealth of Kentucky and nation.
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Values

We are committed to:

- ❖ excellence in research
- ❖ excellence in public service
- ❖ interdisciplinary and interagency research and cooperation
- ❖ professional and personal development of our staff
- ❖ professional and personal integrity
- ❖ institutional and personal accountability
- ❖ quality, safety, and continuous improvement in research programs and administrative procedures
- ❖ respect for diversity and human dignity

Research

Goal:

In support of the land-grant mission of the University of Kentucky, the Kentucky Geological Survey will apply its knowledge and expertise to meet the priority needs of the Commonwealth in the characterization, assessment, and development of Kentucky's mineral and energy resources.

Enabling Strategies:

The Kentucky Geological Survey is providing regional leadership in carbon sequestration research.

- ❖ Conduct research to assist private industry in the discovery and development of oil, natural gas, coal, and coalbed methane resources in Kentucky and contribute to national energy security
- ❖ Evaluate coal quality and coal availability
- ❖ Conduct basic research on the deep subsurface of Kentucky as it relates to energy and mineral resources, future carbon sequestration and storage, and earthquake mechanisms
- ❖ Evaluate the feasibility of carbon sequestration as a strategy to reduce greenhouse gases
- ❖ Develop more expertise in seismic interpretation and reservoir geology/engineering
- ❖ Create a permanent Geologist IV position for a geologist with expertise in reservoir geology/engineering
- ❖ Cooperate with State and Federal agencies to provide public access to mine map information to improve mine safety and protect the environment

Research

Goal:

In support of the land-grant mission of the University of Kentucky, the Kentucky Geological Survey will serve citizens and communities in Kentucky through research in water quality and supply.

Enabling Strategies:

Research on karst and groundwater quality and supply is helping citizens and communities across Kentucky.

- ❖ Search for new sources of water that are safe and suitable for human use and methods to protect the quality of water supplies
 - ❖ Serve the Commonwealth through research in coal-field hydrogeology
 - ❖ Expand interdisciplinary research collaboration with the UK College of Agriculture and Department of Civil Engineering
 - ❖ Collaborate with researchers in the Kentucky Division of Water and other universities to improve the public's understanding of karst geology
 - ❖ Serve communities in Kentucky by studying and finding solutions for karst-related hazards
 - ❖ Create a geologic technician position in hydrogeology
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Goal:

In support of the land-grant mission of the University of Kentucky, the Kentucky Geological Survey will address problems associated with geologic hazards in Kentucky, including landslides, earthquakes, flooding, subsidence, sinkhole collapse, groundwater contamination, and coal-mine safety.

Enabling Strategies:

The Kentucky Geological Survey is providing leadership in research on earthquake hazards in Kentucky and the New Madrid Seismic Zone.

- ❖ Collaborate with the UK Department of Geological Sciences to operate the **Kentucky Seismic and Strong-Motion Network (KSSMN)** and upgrade as necessary
- ❖ Expand the KSSMN by adding at least five stations to increase the capabilities of the network and provide critical information for engineers and geoscientists
- ❖ Expand research collaboration with academic departments at the University of Kentucky, Federal and State government agencies, and research consortia to develop new programs for geologic hazards research and mitigation
- ❖ Apply geophysical methods to characterize geologic hazards
- ❖ Provide information on geologic hazards, seismic hazards in particular, to State and local government agencies and the general public
- ❖ Use records from the KSSMN to provide data to design bridges, buildings, schools, and other structures that are resistant to damage resulting from earthquakes
- ❖ Create two permanent positions for geologists with expertise in geophysics and seismology
- ❖ Purchase drilling equipment for surficial geology and seismology studies
- ❖ Construct a building for repair and servicing of seismic equipment and vehicles in the Western Kentucky Office in Henderson
- ❖ Expand landscape research activity
- ❖ Create a permanent geologist III position in karst hydrogeology

Geologic Data for Research and Public Service

Goal: Complete the creation of digitally vectorized geologic quadrangles (DVGQ's) and 1:100,000-scale geologic maps for the entire state.

Enabling Strategies:

The Kentucky Geological Survey is a national leader in digital geologic mapping.

- ❖ Complete 707 DVGQ's for Kentucky and distribute
 - ❖ Complete 20 new 1:100,000-scale, 30 x 60 minute geologic quadrangle maps for print-on-demand distribution
 - ❖ Complete the county geology for planning map and chart series
 - ❖ Develop applications for digital geologic map data, derivative map products, and Internet map services for land-use planning, environmental protection, and geologic hazard mitigation in Kentucky
 - ❖ Collaborate with Federal and State government agencies to expand the use of digital geologic map data sets for transportation planning and earthquake risk assessment and mitigation
 - ❖ Create a permanent Geologist II position for a geologist specialized in surficial geology and geologic mapping
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Goal: Expand KGS's online integrated geoscience databases for Kentucky.

Enabling Strategies:

- ❖ Integrate in a comprehensive relational database data from geologic databases and official data repositories managed by KGS
- ❖ Design and implement an organization-wide plan for metadata creation and storage for tabular databases
- ❖ Enhance the search and retrieve functions of the online integrated geoscience databases to make access as user-friendly as possible for a diverse audience of users
- ❖ Develop an integrated database for minerals data
- ❖ Use the analytical capabilities of geographic information systems (GIS) to organize data from KGS databases to meet the needs of researchers, government agencies, and the public

Geologic Data for Research and Public Service

Goal: Complete the creation of an online GIS of geologic information for Kentucky.

Enabling Strategies:

- ❖ Complete a spatial database that includes digital geologic maps, karst themes, coal-assessment maps, tabular database locations, and relevant elevation and base-map information
 - ❖ Design and implement an organization-wide plan for metadata creation and storage for spatial GIS themes
 - ❖ Develop ArcIMS Web services for karst, landslides, coal, and general geology
 - ❖ Increase the ArcIMS applications for the user and provide a server that KGS owns and operates for these functions
 - ❖ Train all KGS staff in the use of the spatial database
 - ❖ Collaborate with State and Federal agencies in the development of a mine map information system for Kentucky
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Legislative Mandates

Goal: Provide excellence in research and public service in those programs for which KGS has a legislative mandate from the Commonwealth of Kentucky.

Enabling Strategies:

Increase efficiency, reduce costs, and maintain the highest level of public service possible in fulfilling legislative mandates:

- ❖ *Kentucky Oil and Gas Data Repository:* Integrate KGS oil and gas records with the Kentucky Division of Oil and Gas records and develop a digital well log database
- ❖ *Kentucky Groundwater Data Repository:* Cooperate with the Kentucky Division of Water to make scanned images of water well and spring records available online; provide online access to water-quality data
- ❖ *Kentucky Interagency Groundwater Monitoring Network:* Conduct research to characterize the quality and quantity of Kentucky's groundwater resources
- ❖ *Well Sample and Core Library:* Secure funding to expand the library to archive the entire collection of well samples and cores
- ❖ *Kentucky Seismic and Strong-Motion Network:* Add five new stations and create two permanent positions for geologists with expertise in geophysics and seismology

Public Service and Technology Transfer

Goal:

Improve customer service and enhance public access to the data, maps, and publications available on the KGS Web site, at the Public Information Center in Lexington, and at the Western Kentucky Office in Henderson.

Enabling Strategies:

- ❖ Ensure the efficient and economical delivery of high-quality products and services
 - ❖ Continually update the KGS Web site to provide the most up-to-date data, maps, and publications available for public access
 - ❖ Provide customer-friendly access and rapid distribution of geologic data and products through the KGS Web site, electronic mail, CD-ROM's, and automation of print-on-demand publications
 - ❖ Provide customer-friendly, timely responses to questions from the public
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Goal:

Enhance public awareness of how the earth sciences have an impact on daily life and the economy, and encourage the adoption and use of KGS research products and services.

Enabling Strategies:

- ❖ Host technology-transfer workshops to explain research results and demonstrate relevant applications
- ❖ Encourage KGS scientists to:
 - give presentations at professional and other meetings in local, state, regional, national, and international venues
 - publish the results of their research in KGS publications and academic journals
 - serve on advisory boards at the local, state, regional, national, and international level
- ❖ Present workshops and professional talks to nontraditional audiences (professional planners, landscape architects, and others) to communicate the relevance and value of geologic maps and data for land-use planning, transportation planning, environmental protection, and hazard mitigation
- ❖ Enhance public relations through increased use of press releases, media advisories, articles for local newspapers and journals, and radio and television interviews

Clear communication of the results of KGS research to laypersons in diverse audiences is critical in order to capture the full value of research and public service at the Kentucky Geological Survey.

Educational Outreach and Internships

Goal: Expand the educational resources available on the KGS Web site and offer workshops and internships to communicate information about the earth sciences to teachers and students.

Enabling Strategies:

- ❖ Enhance the KGS Web site as a vehicle for educational outreach
- ❖ Create a permanent position for a Web technology coordinator
- ❖ Expand the Earth Science Education Network on the KGS Web site to meet the earth science information needs of K–12 teachers and students and support the State’s efforts to improve the quality of science education for children in Kentucky
- ❖ Seek external funding for programs to teach and mentor earth science teachers
- ❖ Present workshops for teachers to increase awareness of the online resources, maps and publications, and research expertise available at KGS
- ❖ Provide summer internships for geology students from universities in Kentucky
- ❖ Promote mentoring and academic advising by KGS staff in assisting UK students and serving as academic advisors on thesis committees
- ❖ Provide employment opportunities for UK students to work on KGS research projects and enable the students to gain valuable experience and expertise

Excellence in Stewardship

Goal:

Manage prudently the human resources of the Kentucky Geological Survey and promote the professional and personal development of KGS employees.

Enabling Strategies:

- ❖ Use the UK classification and promotion system to provide professional development and career-advancement opportunities for KGS employees
 - ❖ Encourage lifelong learning by supporting KGS employees who participate in the opportunities for tuition-free classes at the University of Kentucky
 - ❖ Promote ongoing professional development of KGS employees
 - ❖ Treat all KGS employees with respect and encourage open communication
 - ❖ Respect diversity and human dignity
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Goal:

Manage prudently and provide proper maintenance of KGS physical plant facilities, the environmental research laboratory, Well Sample and Core Library, Western Kentucky Office, and the vehicle fleet.

Enabling Strategies:

- ❖ Replace as necessary the analytical equipment in the environmental research laboratory and other research equipment
 - ❖ Replace vehicles as necessary, and provide proper maintenance of the fleet to uphold safety standards
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Fulfilling Priority Needs

Goal:

Secure funding to provide the human resources, physical plant facilities, and research equipment necessary to fulfill the research and public service mission of the Kentucky Geological Survey.

Enabling Strategies:

- ❖ Complete expansion of the Well Sample and Core Library
- ❖ Construct a service and repair facility for seismic equipment and vehicles at the Western Kentucky Office
- ❖ Create a permanent Geologist IV position for a reservoir geologist
- ❖ Create a permanent Geologist II position for a geologist specializing in surficial geology and geologic mapping
- ❖ Add five new stations to the Kentucky Seismic and Strong-Motion Network
- ❖ Create two permanent positions for geologists with expertise in geophysics and seismology
- ❖ Create a permanent position for a Web technology coordinator
- ❖ Purchase drilling equipment and a gamma logging tool for surficial geology and seismology

Strategic Indicators

Goal:

Maintain quantitative indicators of KGS public service activities.

Enabling Strategies:

- ❖ Analyze important trends in customer needs
 - ❖ Evaluate customer-satisfaction surveys
 - ❖ Track strategic indicators (see chart below)
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Public Service Activities 1999–2003

Responses to public inquiries or requests for technical information—47,637 (November 1999 to October 2003)

Number of searches for information or data on the KGS Web site—150 to 200 a day (as of June 2003)

Samples analyzed by Laboratory Services—10,665

Kentucky Geological Survey serial publications completed—111

Digitally vectorized geologic quadrangles completed—242

External publications by staff members—237

Talks to civic and professional groups—657 (November 1999 to October 2003)