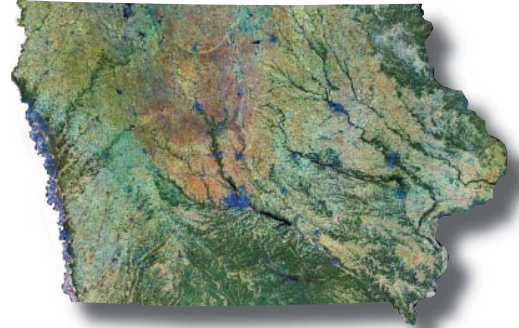




# Our Common Ground

Iowa Department of Natural Resources

Iowa Geological Survey  
Resource Information Fact Sheet 2005-3



## Geosam and the IGS Rock Library

**Geosam** is Iowa's geologic site and sample tracking program. It was developed by the Department of Natural Resources (DNR) – Iowa Geological Survey (IGS) around a digital database that provides location, identification, and other key information about every available well, exposure, or site of geologic information in Iowa. This information is available to anyone via the Internet. Obtaining and providing quality geologic information and interpretations are critical for insuring that Iowa's environment and natural resources are protected. The Geosam database is the electronic catalog for the IGS Rock Library, a collection of rock and other geologic material from many sites in Iowa. Geosam is heavily utilized by DNR staff, geologists, well drillers, environmental consultants, the mineral extraction industry, academia, and

the public, with nearly one million Geosam data accesses every year. IGS geologists utilize Geosam daily to access data for the production of geologic and hydrologic maps, reports, and to respond to information requests. Well drillers, consultants, engineers, and others use Geosam to access data needed to estimate well depth, well construction concepts, the water yield of specific aquifers, and other site-specific design needs.

The principal component of Geosam

is information from water wells drilled in Iowa during the past century. The IGS has maintained a cooperative arrangement with well drillers since the 1930s. IGS provides sample bags and driller's logs, and the drillers collect samples and provide a descriptive log of the well. The descriptive log includes information on location, ownership, earth materials drilled, well development, and water depth and quantity. Geosam also includes data from oil, gas, and other natural resource exploration activities.

Heat-pump wells, engineering test drilling, information from geologic investigation, and data from historic reports and publications are also available in Geosam. There are currently more than 60,000 records in Geosam.

**To access Geosam** on your computer, go to the IGS web site at [www.igsb.uiowa.edu](http://www.igsb.uiowa.edu). Clicking on **Geosam** brings up the homepage (Figure 1). From this page,

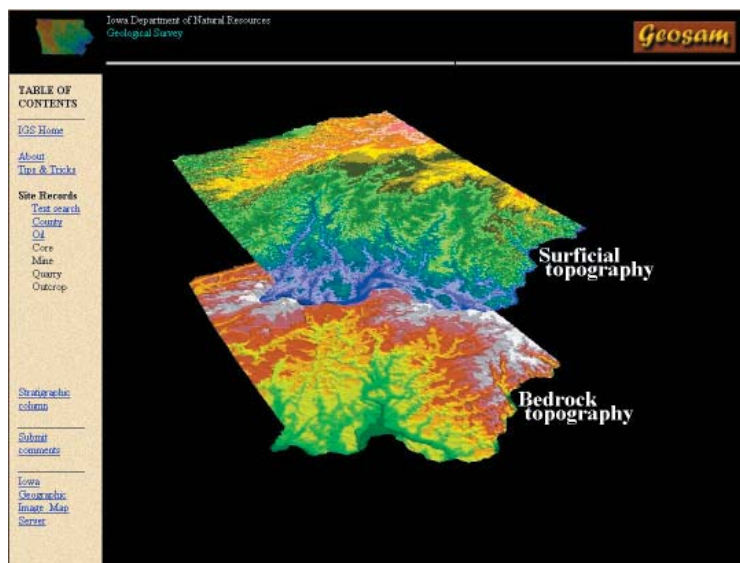


Figure 1. Geosam homepage.

Wnumber	Name owner	Elevation	Location (largest → smallest)	Well depth	Site type
<a href="#">27343</a>	Igs; Cp 43	890	T76N R21W SEC. 6 NE SW NE	391	*Exploration
<a href="#">55979</a>	Bare, David	-	T76N R21W SEC. 6 NW SW SW	335	Private
<a href="#">8043</a>	Pleasantville, City Of, Th #5	-	T76N R21W SEC. 10	38	*Test (water only)
<a href="#">14221</a>	Utah Coal And Mining Co; V-1	-	T76N R21W SEC. 12	300	*Unknown
<a href="#">6568</a>	Hossman, C.P.	912	T76N R21W SEC. 14 NW SE SE	403	*Unknown
<a href="#">41474</a>	Pleasantville, City Of; (NW Town Well)	-	T76N R21W SEC. 15	28	Municipal

Figure 2. Screen displaying Geosam data in a selected area.

data can be accessed by clicking on the word “**County**,” bringing up the county search screen. The county of interest is selected by clicking on the appropriate area of the map. This opens a map of the county that allows the search to be further narrowed by limiting the area of information to be accessed to **Quadrangle** (USGS 7.5’ topographic map area), **Township** (geographic township), **Section** (1 mile square area), **Municipality** (town wells only), or a special **Filtered search** (which can be the owner’s name or the geologic units encountered). Once the method of search is selected, click on the area of interest to retrieve a list of all Geosam data sites in that area (Figure 2). The list includes a **W-number** (Geosam’s unique site identification number), the **Name owner**, **Elevation**, **Location** (township, range, and section), **Well depth**, and **Site type** (type of well, core, exposure, etc.). If a Site type is preceded with an asterisk and colored red, the IGS has conducted a detailed, microscopic examination of the rock samples and produced a striplog

displaying this additional information. Geosam data for a selected well is accessed by clicking on its W-number, bringing up a header card (Figure 3) that includes basic information about the well. In addition to the W-number, owner, driller, elevation, depth and other basic information (shown in the blue-green field), a series of hot links just below the card provide

access to additional information. The **Geology** link brings up a chart that identifies geologic units penetrated by the well and their contact depths. **Water Production** displays available information on static and pumping water levels and the volume of water pumped. **Casing** shows the depths and diameters of the casing installed in the well. The **Striplog** link brings

Iowa Geological Survey Phone: 1-319-335-1575 Fax: 1-319-335-2754		Site Record Wnumber: 19067	
Wnumber: 19067			
Name Owner: Pleasantville, City Of			
County: Marion		Quad map: Pleasantville	
Location: T76N R21W Sec. 15 NW SW SE SW			
Elev: 923	Total depth: 2405	Depth to bedrock: 100	
Driller: Varner Well Co.		Date drilled: October 1, 1966	
Site type: Drilled hole	Well type: Municipal	Sample type: Chips	
Log data: Unknown			
Geologist: Northrup, Richard Cox		Log Date: January 15, 1967	
<a href="#">Exit</a> <a href="#">Geology</a> <a href="#">Water Production</a> <a href="#">Casing</a> <a href="#">Striplog</a> <a href="#">Driller's Log</a>			

Figure 3. Geosam header card.

up a printable, scanned image of the detailed description of the well and the materials sampled during the drilling of the well. A link to the **Driller's Log** displays a description of the well and the materials encountered by the well driller. The striplog (Figure 4) includes the best available information on the location of the well, date drilled, and related information, along with a detailed description of each 5-foot interval sample produced by the microscopic examination of each sample. The description includes the lithology (sandstone, limestone, etc.) of the rocks or other earth material, percentages of the various lithologies in each sample, their characteristics, other minerals or fossils present, and a variety of additional information including the name of the geologic units. The driller's log (if available) provides some of the same information as the strip log, but with much less detail and using driller terminology. Submission of a driller's log is now required for all wells in Iowa. For many wells that have not yet been studied by IGS geologists, the driller's logs provide the best available information on materials drilled.

Geosam is continuously expanded and refined as new samples and information become available and technology improves.

**The IGS Rock Library**, located on the University of Iowa Oakdale Campus just east of highway 965 one mile north of Interstate 80, contains samples of rock and other earth materials (Figure 5) that

have been collected from all regions of Iowa and studied since 1933. The sample collection is called a library because it is organized and used just like a reference library. The samples are collected, catalogued in Geosam, and curated. When information is needed the samples can be retrieved and studied, just like reference books. Samples may be examined or even "checked out" by non-IGS geologists for special tests or analyses.

By far the largest number of samples in the Rock Library have been provided by water well drillers, who collect chip samples of materials as they drill. They commonly use a strainer to collect a sample of the rock chips from the water circulating through the drill bit for every 5 feet of drill penetration. The samples are bagged, labeled with the well name and depth interval, and sent to the IGS. Survey staff assign a W-number to the samples and enter the samples into Geosam and the Library. The samples collected during drilling must be "prepared" before being added to the IGS Rock Library. Preparation includes cleaning off drilling mud and other contaminants where appropriate and placing the sample in a permanent storage envelope. These envelopes are boxed and stored for future study (with their storage location added to their Geosam record).

The driller's logs are sent to the IGS in either paper form or submitted electronically. Information from these logs is entered into Geosam, and paper logs

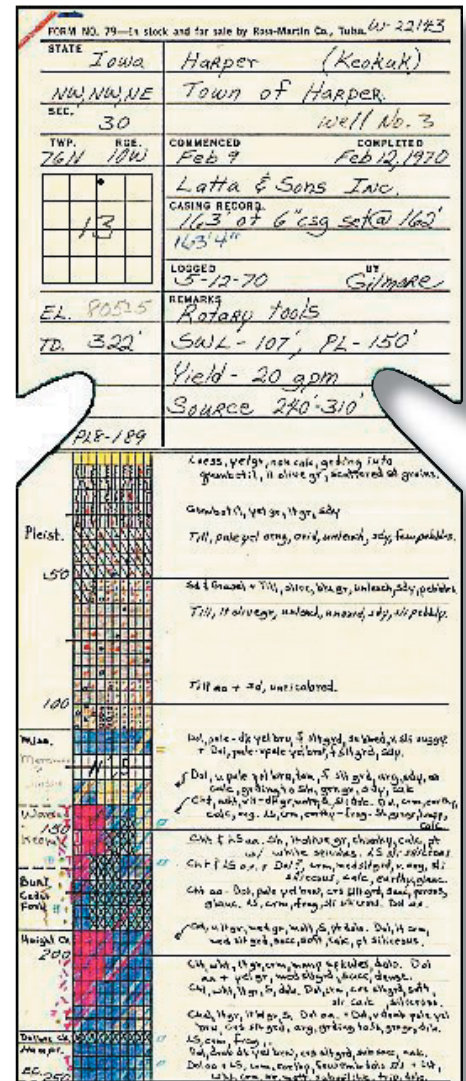


Figure 4. IGS striplog.

are scanned (the images added to the Geosam database), then filed.

The IGS Rock Library includes 1,300,000 chip samples collected during the drilling of 36,000 wells throughout Iowa. These samples represent over 9,575,000 feet (over 1,800 miles) of drilling in Iowa. Another important class of samples in the Library is drill core, cylinders of rock drilled principally during research projects. The Library



**Figure 5.** Samples in the IGS Rock Library.

holds 417,000 feet (almost 80 miles) of core from 944 sites, including cores drilled by the IGS, by utility companies during development of underground gas storage structures, by rock quarries during exploration and quality control, by environmental engineering companies, and from other sources. The Rock Library also includes samples of exposed soil and rock collected from all areas of Iowa. In addition to the samples of earth materials, the IGS Rock Library

contains hundreds of thousands of pages of written documentation that have been scanned and are available through Geosam.

Rock samples in the IGS Rock Library are accessed by a variety of users. IGS geologists are the most frequent users, retrieving samples from the Library for study to learn more about the geology in a specific area as a part of a local or regional study, to address a specific problem, or in response to an

information request. Samples are also used in academic studies (including teaching, mapping projects, geochemical analyses, and mineral resources studies), by environmental consultants (to gain detailed information of local areas), and by mineral exploration companies (to refine stratigraphic relationships and for geochemical analysis), and by others.

The IGS Rock Library represents a virtually irreplaceable tool for the proper utilization and protection of Iowa's geological resources. It would cost over \$190 million to commercially drill and recollect the rock chip samples repositied in the Library today. Preparation and study of these samples would cost an additional \$9.5 million. To drill the core samples in the Rock Library today would cost \$20 million, with an additional \$1.5 million required to prepare and study the cores. The total replacement value of the drill samples and related materials in the IGS Rock Library is **over \$220 million**. This wealth of geologic information will continue to grow as new samples become available, and IGS geologists continue to prepare, preserve, and study these materials, making the information and interpretations available to all users.



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