IOWA'S WATER
## Ambient Monitoring Program
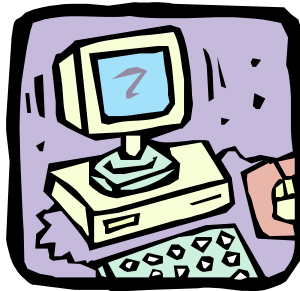
Managing Iowa's Water Quality Information

The ambient water quality program is a diverse program responsible for the collection and analysis of information on Iowa's rivers, lakes, groundwater and wetlands. Physical, chemical, biological and habitat data are administered as part of this program. To handle this complex data set, the Iowa Department of Natural Resources (IDNR) is using the Environmental Protection Agency (EPA) database called STORET (STOrage and RETrieval). Not only will STORET allow the IDNR to comprehensively handle its water monitoring data, the use of STORET also ensures compatibility with data from other state and federal agencies. It is envisioned that STORET will be a "one-stop shopping" location for all the state's water monitoring data. This would include the coordination of data from other entities such as municipalities, citizen monitoring groups, universities and others into the STORET data management system. Current plans for public retrieval of data include a Web-based interface that provides an interactive mapping application. This allows a user to click on a station or set of stations to view the data, display the data in graphical form, or see statistical summaries. Users will also be able to download data in a variety of formats, including flat-files and Excel files.
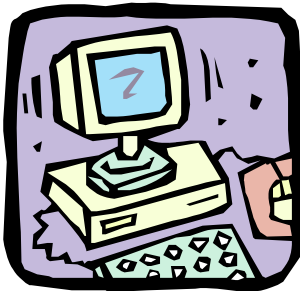
The use of STORET as a data management tool is currently in transition as the EPA migrates to a new, modern STORET database. At this point in time, STORET is functionally two separate databases: *Legacy STORET* and *Modern STORET*.

Legacy STORET

The original STORET database was developed 30 years ago to allow various agencies to share water quality information. STORET was a mainframe computer database operated
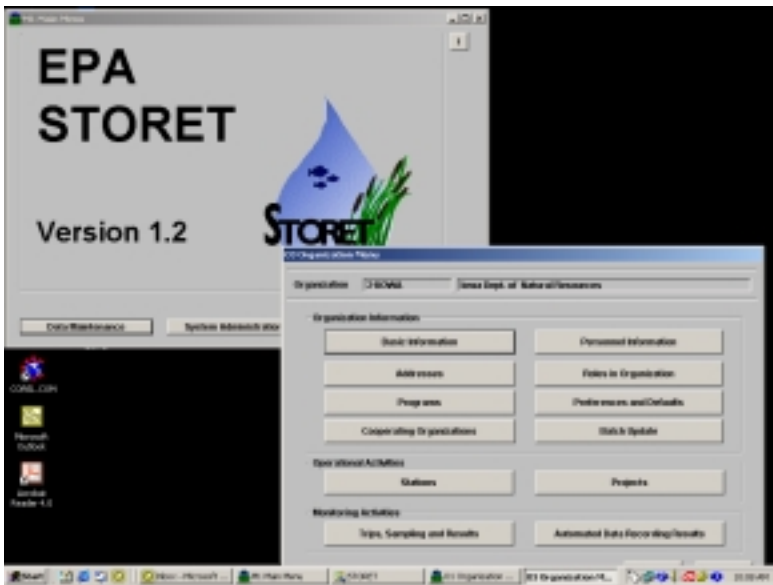
Modern STORET operates on an Oracle™ platform. Because STORET is managed at the local level, users are able to customize the data to fit within their individual monitoring programs.

and maintained by the EPA. Government users of the database were assigned user IDs and passwords to store and retrieve data. Public access to data was only available through the EPA and required a staff member to query the database and send results to the requestor. Legacy STORET housed chemical, physical and biological data, but did not provide information on the monitoring metadata. *Metadata* is the "data about the data" and contains information such as the sample equipment, sampling methodology, laboratory techniques and the accuracy of measurements such as location, elevation and analytical results. This information is important because it provides quality control of the data.

As computer technology has advanced and the volume of monitoring activities has increased, it became necessary to overhaul the STORET system into a more flexible, modern system. This modernization began in the early 1990s and has resulted in a new STORET database. However, much of the previous STORET data does not contain information required in the new system. Therefore the old or "legacy" data has been migrated to a separate Oracle™ database and is archived for the EPA at the Legacy Data Center (LDC) in Research Triangle Park, North Carolina. The Legacy STORET database contains information through 1998, but was "frozen" January 1, 1999. All data collected after January 1, 1999 is housed in Modern STORET. Public access to the LDC is available through the EPA web page. States may migrate legacy data to the new system once the data has been documented and the proper metadata requirements have been fulfilled. The

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Basic Iowa Station Information

Click on the station name to get latest water quality results.

Station	Station Id	County Name	Latitude	Longitude
Cedar River Downstream of Cedar Rapids	10570001	LINN	41.9257	-91.5504
Cedar River Upstream of Cedar Rapids	10570002	LINN	42.0692	-91.7847

Row(s) 1 - 2

IDNR intends to migrate much of its legacy data to the new, modern system. Migration of data from valuable long-term projects such as the Des Moines River Network conducted by Iowa State University/Corps of Engineers and IDNR's 16 long-term monitoring stations has already begun.

Modern STORET

Modern STORET was designed using the concept of a distributed or decentralized data management system. Advances in PC and client/server technology have made the use of mainframe computer systems obsolete. By abandoning the mainframe or centralized database, the modern system allows each agency to install STORET locally and customize the database to meet its specific management needs. Modern STORET runs on a powerful Oracle™ database platform and is therefore relational to other databases used to manage water resources. In this way, Iowa STORET data will be easily shared and integrated with data from other states. Modern STORET improves upon the Legacy system by storing metadata information and, by keeping data ownership at a local level, providing a more flexible database to users. Data is managed and stored at the local level and agencies may upload their STORET information to the centralized EPA data warehouse. In contrast to the old system where only the EPA was able to make changes to the mainframe system, the data warehouse serves only as a repository. The original and working copy of the database remains at the local level. Public access to the modern STORET data warehouse is
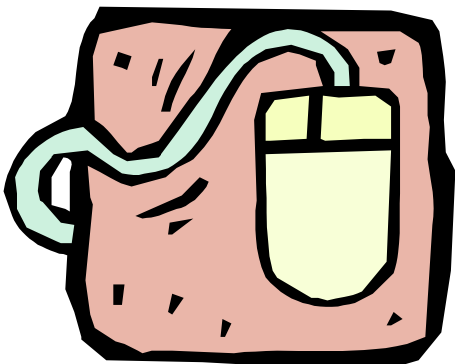
available through the Web. The IDNR will provide direct web access to Iowa's modern STORET database in the near future. Public release of the STORET database on the Internet is scheduled for Spring 2001.

Data Retrieval

Plans for data retrieval are currently underway. IDNR is committed to providing water quality information to the public in a user-friendly way using web-based tools. Software products such as Oracle WebDB™ and ArcIMS™ will allow the user to access the latest information available without having to send a request through a staff member. Plans also call for live, interactive graphing, charting, mapping and statistical summaries that provide information to the user along with the ability to download raw data. Much of the design for data retrieval will be similar to IOWATER (Iowa's volunteer monitoring program), which is currently using ArcIMS™ to display monitoring sites and access data.
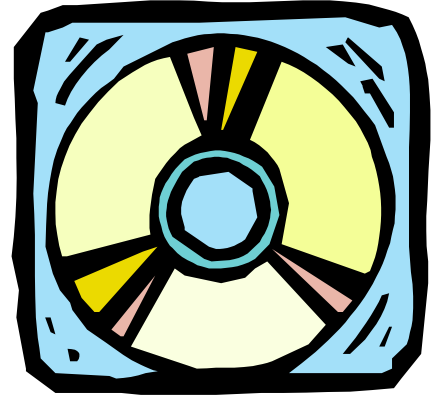
- Legacy STORET and Modern STORET data can be accessed from the EPA at **www.epa.gov/storet**

- IOWATER data is currently available online at **www.iowater.net**

- Iowa STORET will serve as a statewide clearinghouse of water quality data

- Iowa STORET data can be accessed at **www. igsb.uiowa.edu** (click on Iowa's Ambient Water Monitoring Program and go to the Water Quality Data page)

- Plans for Data Retrieval
  - Web-based platform
  - Browse data online
  - Download raw data files (Excel, ASCII, HTML)
  - Interactive graphing, charts, statistics
  - Interactive maps and mapping applications
  - Immediate access to the latest data