Title: Ground Water Quality Map (Environmental Data Management System - EDMS)

State: Idaho

Category: Information Communications Technology (ICT) Innovations

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Executive Summary

The Environmental Data Management System (EDMS) was established by the Ground Water Quality Protection Act of 1989 and provided for the development of a central database designed to house Idaho ground water quality data and well characteristics from multiple agencies. The Idaho Ground Water Protection Interagency Cooperative Agreement establishes the EDMS as the repository for ground water quality data to facilitate cooperative ground water protection programs among multiple state agencies. The EDMS database contains more than 450,000 analytical results. To provide the greatest use of this database by the public, state and federal agencies, consultants and universities, the data needs to be easily accessible in a variety of formats. The Idaho Department of Water Resources (IDWR) has developed a sophisticated mapping application that will allow individuals to view, select, query and download water quality time-series data. The application also allows users to create printed maps in PDF format from desktops, laptops, tablets and mobile devices. Users can easily locate themselves by using GPS-enabled devices or by entering geographic coordinates or by entering a street address, parcel pin, public land survey location or stream name.

This map-interface allows users to explore not only the EDMS data, but the connection/interaction between these water-quality data and GIS layers used for other processes, such as water rights, ground water pumping, etc. The mapping application is accessible as a map service and can be integrated with other map services or GIS applications.

The map application is one component of a suite of applications, based on the same mobile-friendly user interface. These applications, many of which are focused on specific business processes, can be found in the Online Research panel of IDWR's home page, http://www.idwr.idaho.gov/.

The mapping application and suite provide 'one stop shopping,' providing individuals the ability to access, download, and query information. The mapping suite also provides access to water quality data and well characteristics from several state agencies and provides retrieval via the internet. The suite allows users with or without GIS software to view data (such as water quality) from a variety of devices. The public can enter an address and see the results of water quality samples near their house or business or can create their own area of interest. Since the information is also served as a map service, other agencies or companies can utilize the information for their analysis, as well.

Concept:

The Environmental Data Management System (EDMS) was established by the Ground Water Quality Protection Act of 1989 and provided for the development of a central database designed to house Idaho ground water quality data and well characteristics from multiple agencies. The Idaho Ground Water Protection Interagency Cooperative Agreement establishes the EDMS as the repository for ground water quality data to facilitate cooperative ground water protection programs among multiple state agencies.

Before this application was written, there was no publicly available way to investigate the relationship between the ground-water quality and its use for beneficial purposes in a geographical area. Researchers or lay persons would have to contact several state agencies to collect these data and provide their own way of presenting them.

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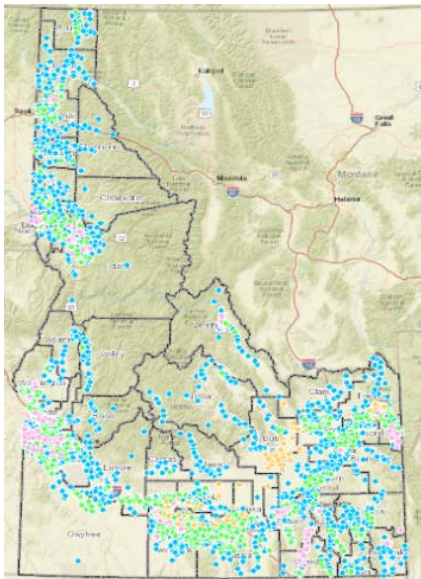
EDMS provides a sophisticated mapping application that will allow individuals to view a map of ground water quality monitoring sites within Idaho. Being browser based, it allows users to view, select, query and download water quality time-series data and create "printed maps" in PDF format from desktops, laptops, tablets and mobile devices. Users can easily locate themselves by using GPS-enabled devices/coordinates or by entering street address, parcel pin, public land survey or stream information.

This mapping application can be found at http://maps.idwr.idaho.gov/map/edms.

Information regarding its use is available at: http://maps.idwr.idaho.gov/Map/content/Help/UsersManual.pdf. The ground water quality database (EDMS) contains more than 450,000 analytical results records from laboratory tests for contaminants and water measurement parameters. These were produced from more than 17,000 ground water samples taken at over 4,000 sites throughout Idaho by many agencies, including Idaho Department of Water Resources (IDWR), Idaho Department of Environmental Quality (IDEQ), Idaho State Department of Agriculture (ISDA) and the Idaho National Laboratory (INL).

This map-interface allows users to explore not only the EDMS data, but the connection/interaction between these water-quality data and GIS layers used for other processes, such as water rights, ground water pumping, etc.

Users can download and graph time-series data, download the attributes associated with monitoring sites, or download Esri-format shape-files for work in another GIS. Additionally, users can drag-and-drop map-layers from other agencies/businesses or shape-files from their own desktop computers or devices.

This map is one component of a suite of applications, based on the same mobile-friendly user interface. These applications, many of which are focused on specific business processes, can be found in the Online Research panel of IDWR's home page, http://www.idwr.idaho.gov/. The capability to download data is similar across the entire suite.

Significance:

The mapping application and suite provide 'one stop shopping,' providing individuals the ability to access, download, and query information. The mapping suite also provides access to water quality data and well characteristics from several state agencies and provides retrieval via the internet. The suite allows users with or without GIS software to view data (such as water quality) from a variety of devices. The public can enter an address and see the results of water quality samples near their house or business or can create their own area of interest. Since the information is also served as a map service, other agencies or companies can utilize the information for their analysis, as well. By providing groundwater quality data from multiple agencies in one site, the user has the convenience of being able to view and query data in a tabular, graphical or map format rather than having to visit multiple agencies or sites. By serving the data over the internet, users can access the data over their phone or mobile device. Advanced users can access the data via map services and assemble with other GIS data layers

http://maps.idwr.idaho.gov/arcgis/rest/services/BP/_EDMS/MapServer , or download the information for additional analysis offline.

Impact:

The objectives of EDMS are to characterize the ground-water quality of the state's major aquifers, identify trends and changes in ground-water quality within the state's major aquifers, and identify potential ground-water quality problem areas. This data can be used for trend monitoring, parameter-specific studies, remediation studies, or to define environmental characteristics in an area. The suite of mapping tools provides a transparent and easy way for the public and other agencies to see and use the data that is being gathered throughout the state, for the benefit of all.

The entire range of users, from those who wish to know about the ground-water quality near a prospective home to scientists collecting data to assess current ground-water quality and how a proposed development or business may impact it, is served by one interactive map.

Before this application was written, there was no publicly available way to investigate the relationship between the ground-water quality and its use for beneficial purposes in a geographical area. Researchers or lay persons would have to contact several state agencies to collect these data and provide their own way of presenting them.

This application:

- Provides for selecting monitoring sites by specifying a geographical area, rather than accepting aggregation by county or some larger area;
- Allows a user to create a map of their area of interest without knowing how to use GIS;
- Provides a tool for scientists to download test results and associated characteristics for selected locations, for additional analysis in a GIS or other software system;
- Provides a way to visualize the water-quality data and analyze trends by creating graphs of those data;
- Allows a user to access all of these data in the field, in a particular area of interest, by using a mobile device's web-browsing and GPS capabilities.

    The convenience users experience by going to one site rather than a variety of sites to get information is a major time and cost savings for users. Another time/cost saving feature is that this system provides data from many different agencies in the same format. This eliminates the need to reformat disparate data

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sets prior to use, allowing the data to be analyzed, queried, and downloaded in a timely manner. An additional time/cost savings is the ability to query the data while in the field, via smart phone using the phone's GPS or by querying a street address, to see ground water data near a selected area of interest in real time, while on site.