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USING AN ENVIRONMENTAL DATA WAREHOUSE TO INTEGRATE ANALYTICAL DATA, GIS, AND THE WEB

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Large, complex facilities such as military bases, research and development laboratories, and Superfund sites generate ever-growing sets of reports, documents, analyses, and GIS databases from the multitude of projects associated with each facility. Unfortunately, many of these data and documents are stored in different databases and coordinate systems, using formats that do not allow for easy exchange among users. In addition, facilities management documents are usually stored in CAD applications that cannot be readily used by GIS technologies. Scientists, contractors, governmental regulators, and others who require daily access to data from hundreds of sampling events, geotechnical investigations, and site-specific GIS features are hindered by the time and effort necessary to gather and prepare these historical data into a useable format.

The Web-based, GIS-enabled Environmental Data Warehouse used for the U.S. DOE Portsmouth and Paducah Gaseous Diffusion Plants illustrates how complex data from a variety of geotechnical, biological, environmental, and health safety studies can be integrated into an easy-to-use interface. Analytical data that are stored in government, university, and contractor databases are harvested using a rule-based process. The data are then reformatted, indexed, and stored in a spatially enabled data warehouse in which each sample location is linked to a master sample location feature table. Likewise, site locations, facility CAD drawings, maps, and photography are converted and loaded into an ESRI ArcGIS geodatabase. Authorized end-users can then access the data via the Web to retrieve and deliver data in prescribed formats, including graphs, maps, charts, and downloads to other applications. The interface allows users to search by text query or by selecting features from a map. Drop-down and menu lists are dynamically generated from the database, allowing simple point-and-click or more robust data mining based on user needs.

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