



Project Summary

US Army Engineer
Research and Development Center
Waterways Experiment Station

November 1999

Public Affairs Office Ž 3909 Halls Ferry Road Ž Vicksburg, MS 39180-6199 Ž (601) 634-2504 Ž <http://www.wes.army.mil>

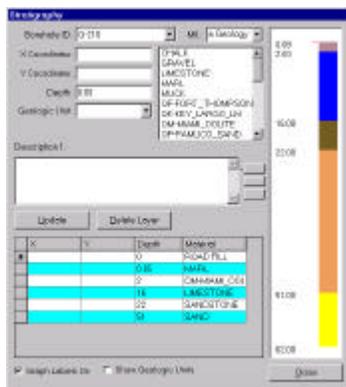
Design and Implementation of a Comprehensive Geotechnical Database

Principal Investigators: [Dr. James H. May](#) and [Ms. Maureen K. Corcoran](#), CEERD-GG, Phone (601) 634-3395 and (601) 634-3334

Objectives: Develop a format for a comprehensive geotechnical database combining the power of interactive computer technologies with geotechnical expertise and knowledge of how data are used in practical engineering decisions. Optimize data analysis and visualization options by interfacing a geographic information system (GIS), the Dept. of Defense Groundwater Modeling System (GMS), Environmental Quality Information System (EQuIS), gEOTECHNICAL INTEgrator (gINT), and the Internet. Build a geotechnical database for the USAE District, Jacksonville, that will support a wide range of Corps activities including wetland evaluation and restoration, hydrogeologic studies, groundwater and surface water modeling, and infrastructure construction and rehabilitation. Create optimal accessibility via Internet using a Web-based GIS. Maintain Corps leadership in engineering application and quality control of geotechnical data, and provide interagency access through coordination with the United States Geological Survey (USGS) and the South Florida Water Management District.

Problem: Engineering and environmental decisions in the 21st century must be grounded on knowledge of the subsurface gained through decades of geotechnical exploration. The wealth of geotechnical data, most of which are in cumbersome paper formats, can be used only if it is accessible through a computer-based system, ready for application in a variety of software packages to address specific geotechnical and environmental problems, and easily and frequently updated.

Approach: An area of Dade County, Florida, was selected by Jacksonville District to demonstrate the application of advanced computer technology in the construction of a comprehensive geotechnical database.



Map output is displayed in three coordinate systems, Universal Transverse Mercator (UTM), Florida State Plane, and Latitude / Longitude showing the location of the wells and borings included in the database. Digital maps are displayed and manipulated using ArcView 3.2, a MicroSoft Windows-based GIS. Geotechnical data were gathered from the Florida Geological Survey, the USGS, the Metropolitan Dade County, Florida Environmental Resources Management office, and the Florida Dept. of Transportation. Lithologic data were entered into EQuIS Geology 2.2 because it combines subsurface data into a single management system and interfaces easily with GMS, ArcView, Surfer, and LogPlot98. The data may be easily imported to gINT. Available geotechnical data for any well or boring can be viewed and utilized. A live-link to the Internet provides real-time input of water levels from a well network

in southern Florida. Development of this prototype provides a basis for inclusion of a much larger area into a comprehensive geotechnical database and future implementation of a Web-based GIS.

Products: A report describing the procedures used to set up the database and the geotechnical data for the test area, and extensive on-line information.