GIS Applications for Title IV and V Mining Programs in West Virginia

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Background

West Virginia Department of Environmental Protection (WVDEP) is deploying an Enterprise Information System (EIS), following a client-server architecture.

Background: Client-Server Architecture

- Server: Oracle databases
- Middle tier: application servers
- Client: database applications

Background: Oracle Databases

- ERIS: Environmental Resource Information System, tracking information about all kinds of environmental regulatory activities
- EQuIS: Environmental Quality Information System, tracking information about sample data collection, processing, management & evaluation aspects of environmental project work
- RIMS: Reclamation Information Management System, tracking information on the Title IV mining program for sites abandoned prior to the passage of the Federal Surface Mining Control and Reclamation Act of 1977.
- ArcSDE geo-database: a multiuser spatial database storing state-wide geographic data.

Background: Database Applications

- ERIS dialup/ERIS 32
- EQuIS for GIS interface
- Abandoned Mines Lands Management Information System (AMLMIS) for RIMS
- Interactive Mapper
- Aerial Photography Browser
- Other Internet and Intranet tools

Background: Challenge to Title IV & V Programs

- Challenge

  Electronically link GIS data with data in non-spatial databases (e.g., ERIS & RIMS)

- Why?
  - Available in-house database applications didn't offer such a function
  - Most employees lack advanced GIS skills to utilize GIS software (e.g., ArcGIS)

Background: Solution

The Technical Applications and GIS (TAGIS) unit at WVDEP initiated projects to develop GIS applications to address the issue for the two programs.

Introduction to GIS Applications

- Application development issues
- Application issues

Intro. To GIS Applications: Development Issues

- Who would be the end-users of the applications?
  - Employees in the two programs & WVDEP staff interested in the program data
  - Majority not GIS/computer proficient
- What functionality should the applications contain?
  - Simplify the process of composite query
  - Don’t replace available database applications
  - Provide easy access to GIS data
  - Improve ArcGIS performance
- What principles should the application development follow?
  - Economy
  - Ease-of-use

Intro. To GIS Applications: Application Issues

- Languages/techniques used

  Microsoft Visual Basic 6.0, Microsoft ActiveX Data Object (ADO), Microsoft OLE DB provider, Microsoft Component Object Module (COM), ESRI ArcObjects library, Oracle SQL statements
- Application set-up
  - Toolbars integrated into ESRI ArcGIS ArcMap platform
  - ArcMap running via a Citrix Metaframe terminal services architecture
- Application structure
  - A toolbar each
  - Four groups/toolbar: accessing GIS data; searching spatial features; querying database; goodies

Demonstration

- Example 1: querying problem area description (PAD) information
- Example 2: searching violations caused by Elk Run Coal Company, Inc.

Demonstration: Example 1

This example displays the location of the AML&R site tagged with PAD ID “WV0004” and retrieves relevant information stored in RIMS and/or Office of Surface Mining (OSM)’s AMLS database using the AML toolbar

Demonstration: Example 2

This example visually displays all violations caused by Elk Run Coal Company, Inc. using the DMR toolbar

Further Improvement

- A report function may be needed.
- Can the applications work well in ArcGIS 9.0?

Questions & Comments

- Questions
- Comments