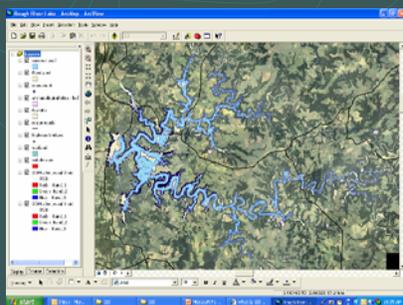


Geographic Information Systems "The Power of GIS"

Mark D. Wilmes
Park Manager
Rough River Lake
Phone 270-257-2061
mark.d.wilmes@usace.army.mil

What is GIS?



GIS is a collection of computer hardware, software, and geographic data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.



How Does GIS Use Geography?

With a geographic information system (GIS), you can link information (attributes) to location data, such as people to addresses, buildings to parcels, or streets within a network. You can then layer that information to give you a better understanding of how it all works together. You choose what layers to combine based on what questions you need to answer.



Three Views of a GIS

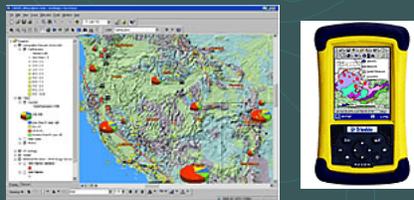
A GIS is most often associated with maps. A map, however, is only one way you can work with geographic data in a GIS, and only one type of product generated by a GIS. This is important, because it means that a GIS can provide a **great deal more problem-solving capabilities than using a simple mapping program or adding data to an online mapping tool**

The Database View



A GIS is a unique kind of database of the world—a geographic database (geodatabase). It is an "Information System for Geography." Fundamentally, a GIS is based on a structured database that describes the world in geographic terms.

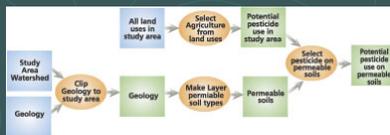
The Map View



A GIS is a set of intelligent maps and other views that show features and feature relationships on the earth's surface. Maps of the underlying geographic information can be constructed and used as "windows into the database" to support queries, analysis, and editing of the information. This is called geovisualization.

The Model View

A GIS is a set of information transformation tools that derive new geographic datasets from existing datasets. These geoprocessing functions take information from existing datasets, apply analytic functions, and write results into new derived datasets.



GIS Components

- Hardware
- Software
- Data



Hardware - GIS Infrastructure

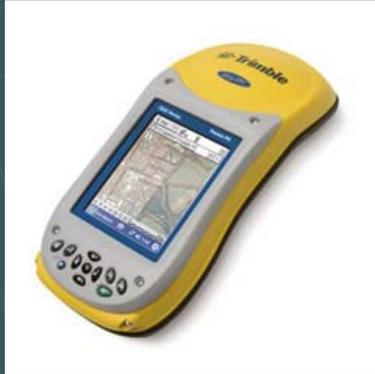


Technology infrastructure needed to support your GIS implementation.

HP DesignJet 800 Printer/Plotter



Global Positioning System (GPS)

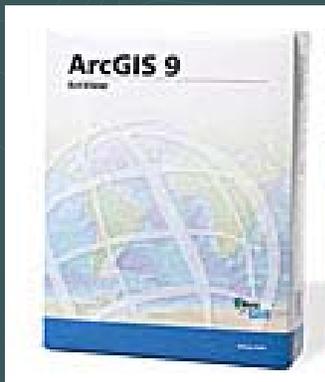


The GPS is made up of three parts: satellites orbiting the Earth; control and monitoring stations on Earth; and the GPS receivers owned by users. GPS satellites broadcast signals from space that are picked up and identified by GPS receivers. Each GPS receiver then provides three-dimensional location (latitude, longitude, and altitude) plus the time.



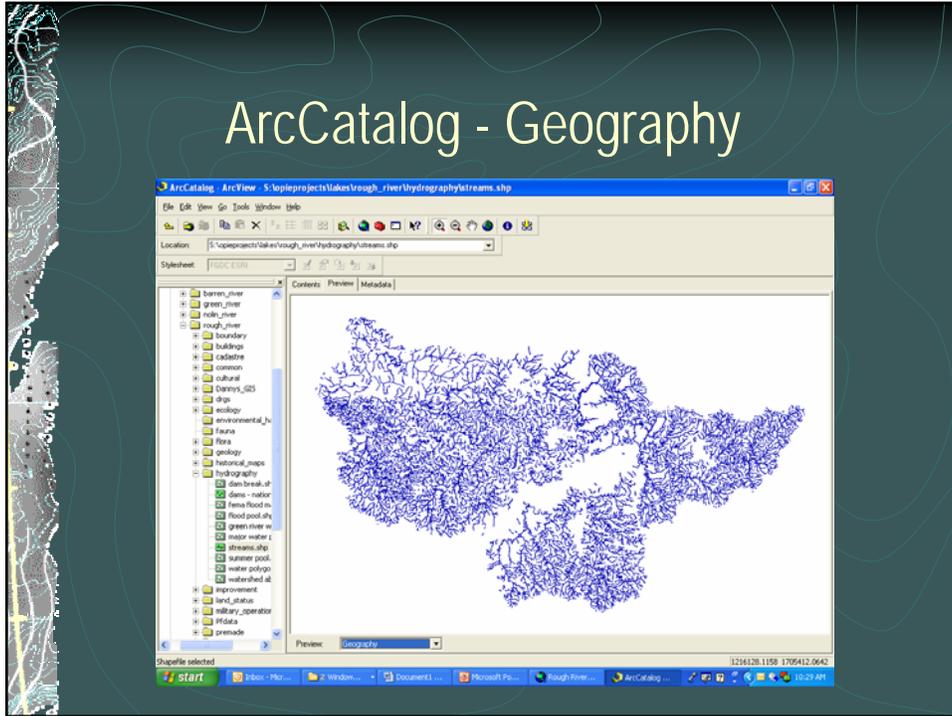


GIS - Software

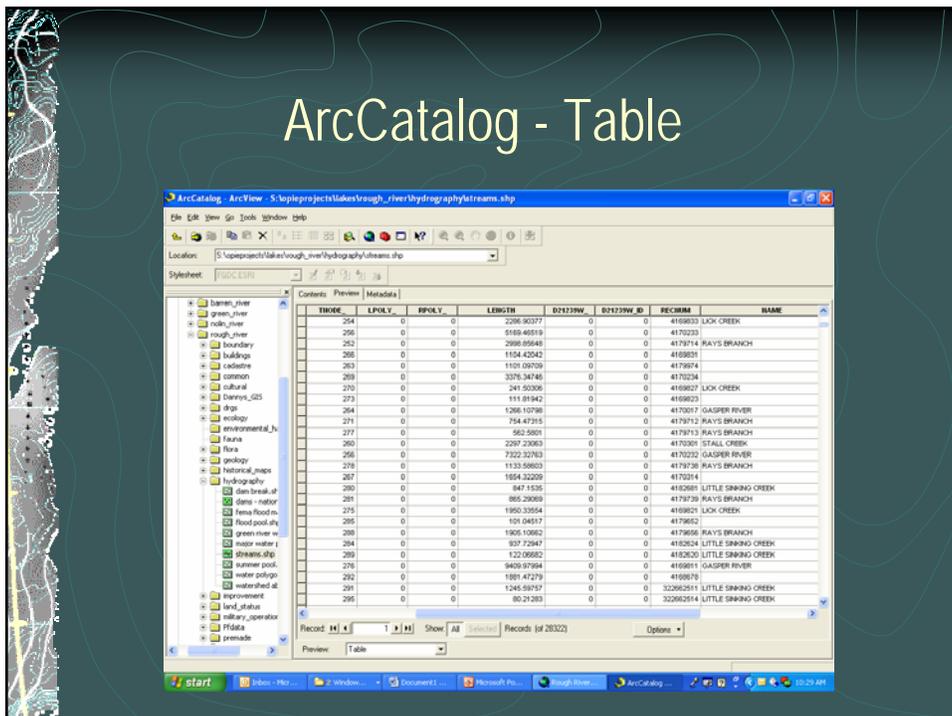


- 1992 ESRI ArcView 1.0
- 1994 ArcView 2.0
- 1996 ArcView 3.0
- ArcView 3.x to Arc GIS
- 2001 ArcGIS 8.1
- 2004 ArcGIS 9

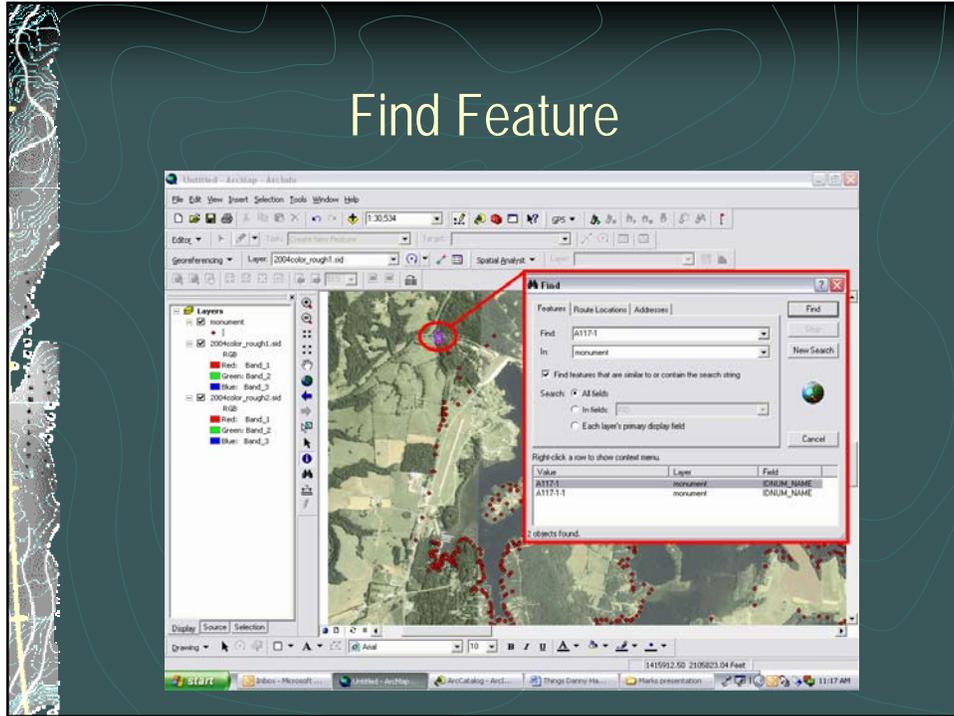
ArcCatalog - Geography



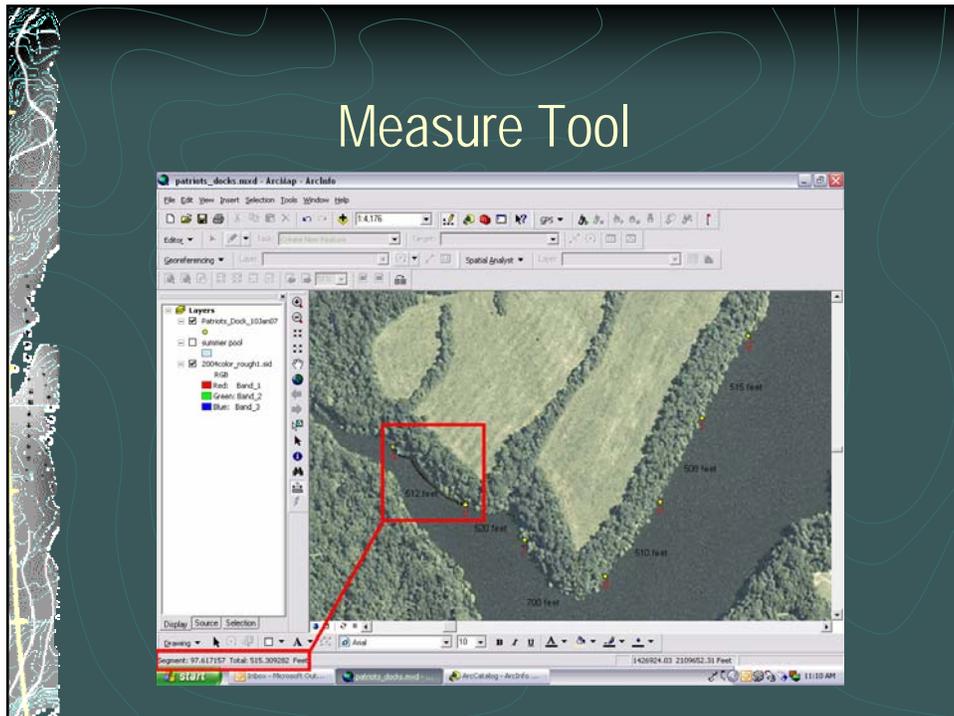
ArcCatalog - Table



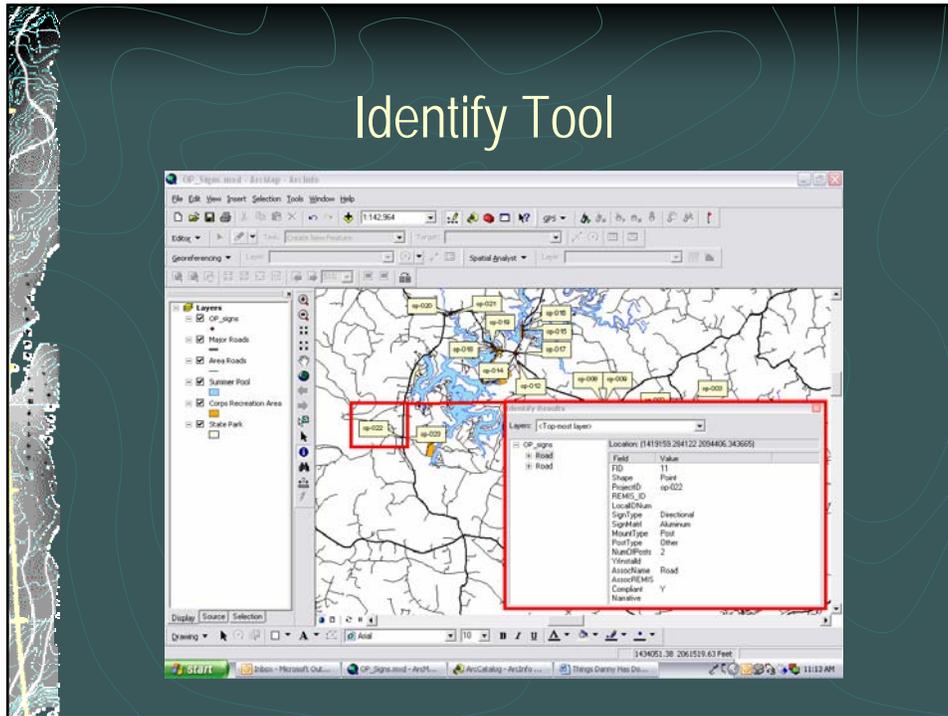
Find Feature



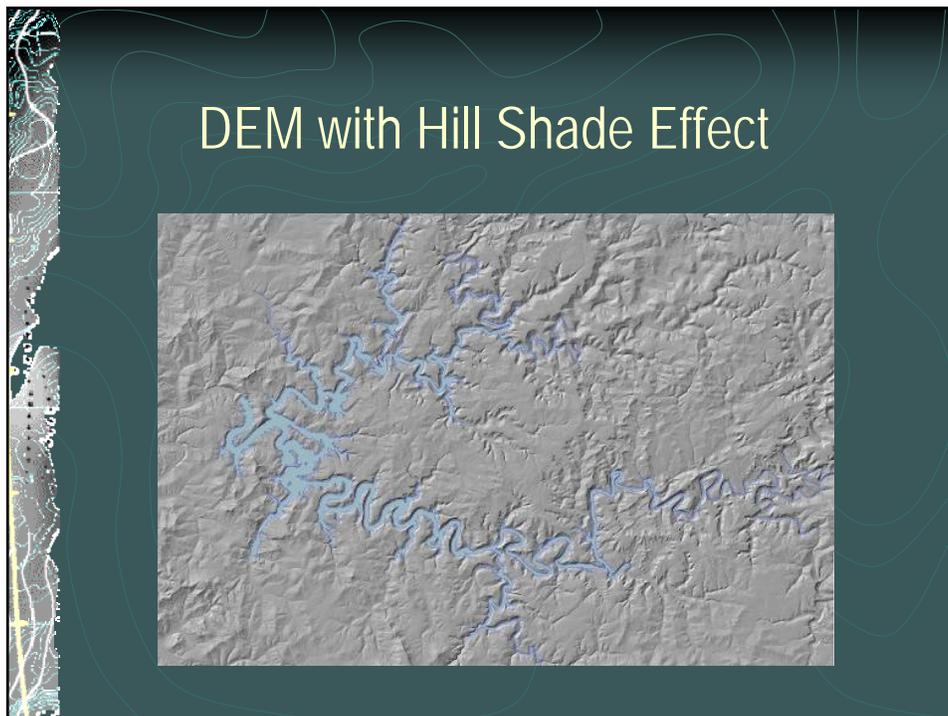
Measure Tool



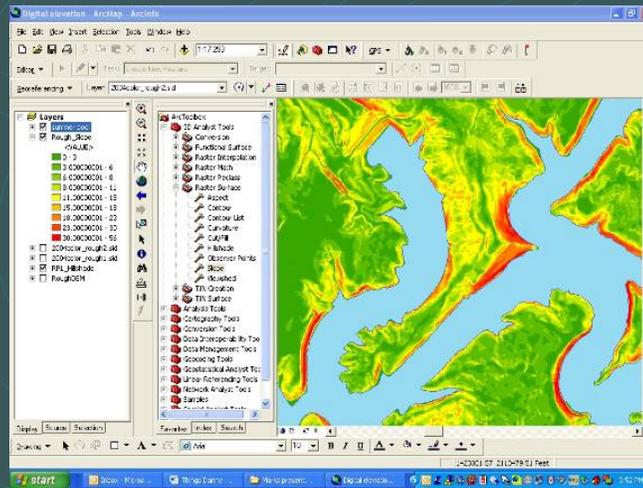
Identify Tool



DEM with Hill Shade Effect



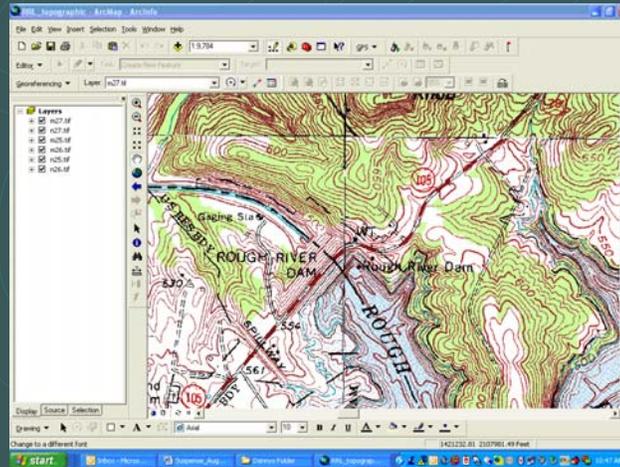
Slope created from (DEM) showing grade



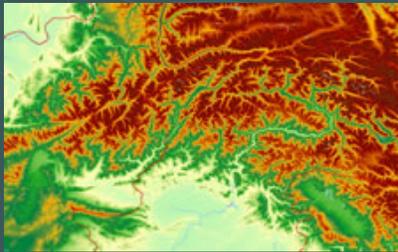
Arc Scene



Topographic Quad Maps



GIS Data



The backbone of GIS is good data. Inaccurate data can result in inaccurate models and maps, skewing the results of your analysis and ultimately resulting in poor decisions. "Garbage in, garbage out,"



GIS Projects

- O&M/M&M Contracts
- Infrastructure/Facility Management
- Shoreline Management
- Natural Resource Management
- Recreation Management



O&M/M&M Contracts

- Mowing zones, Rec. Areas
- Restrooms, buildings
- Garbage cans, dump stations
- Playgrounds
- Beaches
- Maintenance zones

Mowing & Maintenance Contracts



Utilities/Infrastructure

- Electric – Lines, boxes, meters, pedestals, etc.
- Phone – Lines, service
- Sewer – Lines, plants, lift stations, etc.
- Water – Lines, meters, outlets, valves
- Septic fields, sewage lagoons, STP
- Roads, bridges, RR, etc.

Shoreline Management

- Shoreline Management Zones
- Boat docks
- Fee land, easements
- Leases, licenses, permits
- Bouys

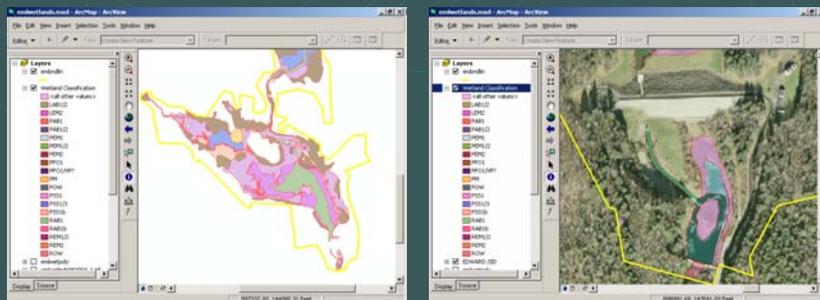
Flowage Easement from DEM



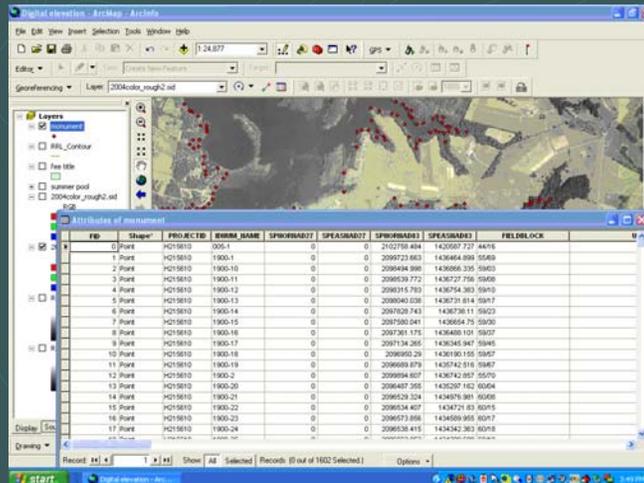
Natural Resource Management

- Wildlife Management Areas
- Food plots, nesting boxes, fish attractors
- Wetlands
- Historic/cultural resources
- Vegetation layers – Timber stands, aquatic veg.
- T&E Species

Wetland Layer



Boundary Monument Layer



Boundary Monument Attributes

- State Plane Northing –NAD 83
- State Plane Easting –NAD 83
- Material
- Condition
- Tract Number
- Witness Tree Info
- Inspector
- Date Inspected



Recreation Management

- Campgrounds, loops, campsites
- Amenities – Picnic tables, fire rings, etc.
- Signs, buildings, beaches, etc.
- Utilities – water, electric, sewer
- Trails

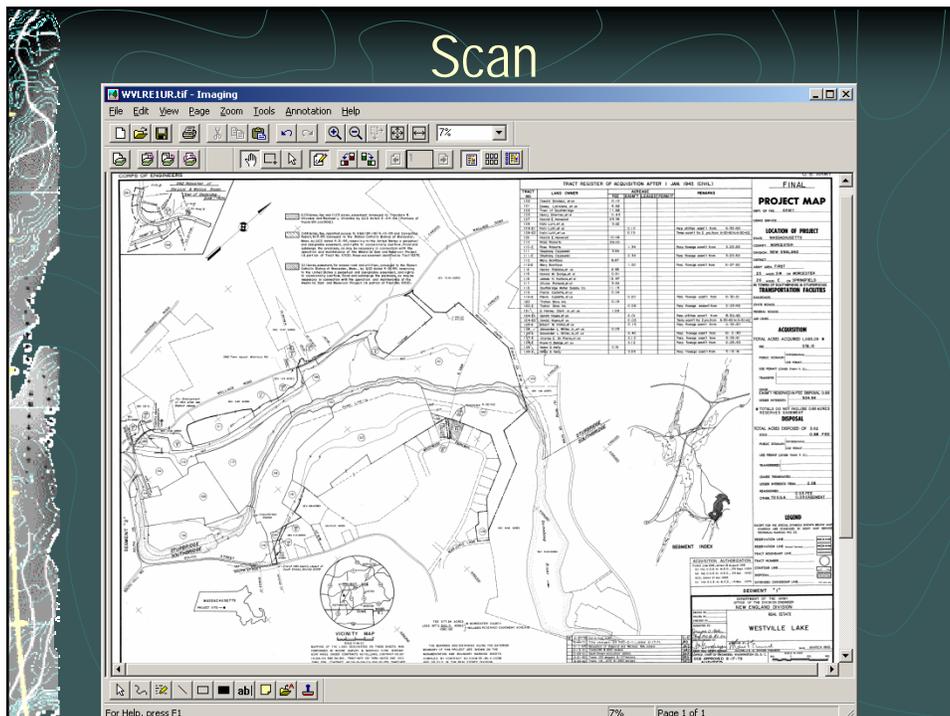
Park Features



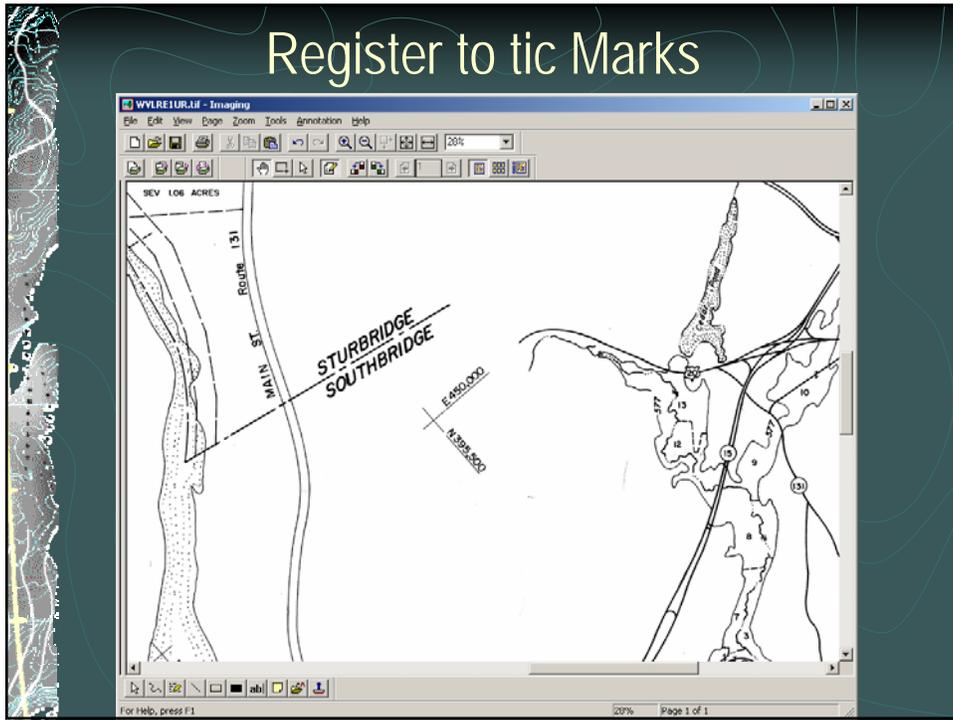
Real Estate Tracts at Flood Control Projects

- Scan and register Real Estate Tract Maps
- Digitize Real Estate Tracts
- Quality Control and Decision Making
- Create a blank geodatabase
- Import your shapefile into the geodatabase
- Run CADD/GIS Technology Center's Cadastre Real Estate Tool in ArcGIS to extract data from REMIS database and insert it into the Real Estate Tract geodatabase.

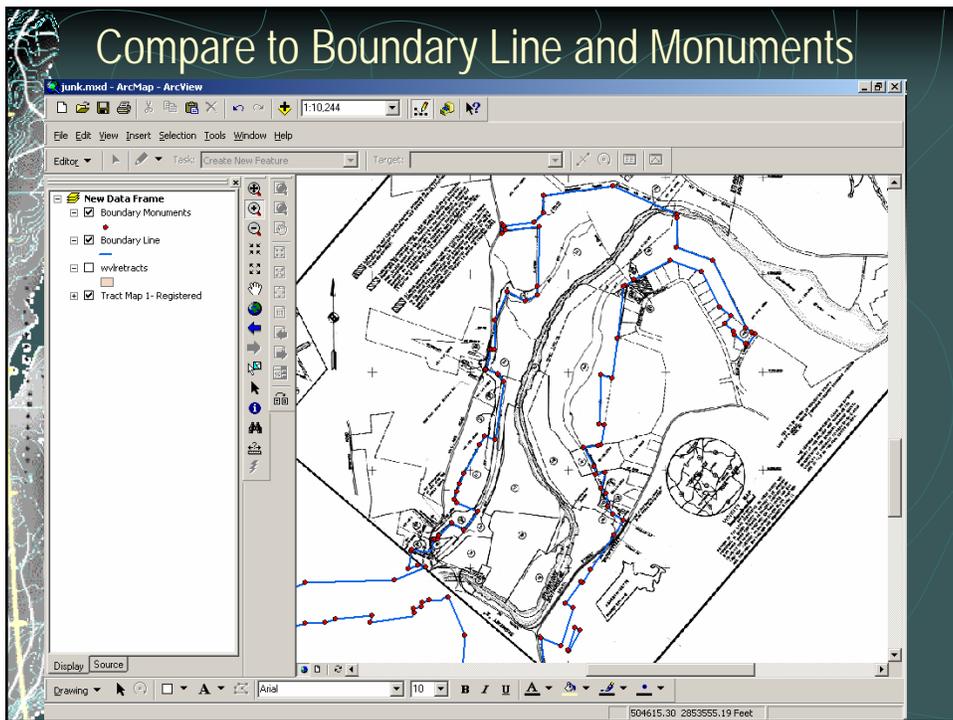
Scan



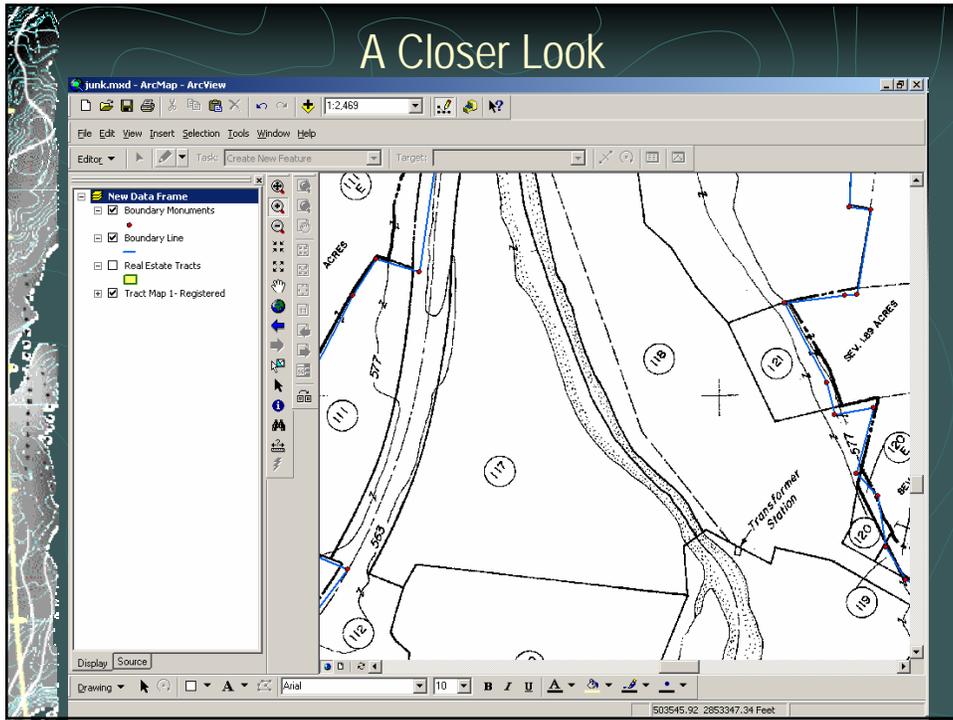
Register to tic Marks



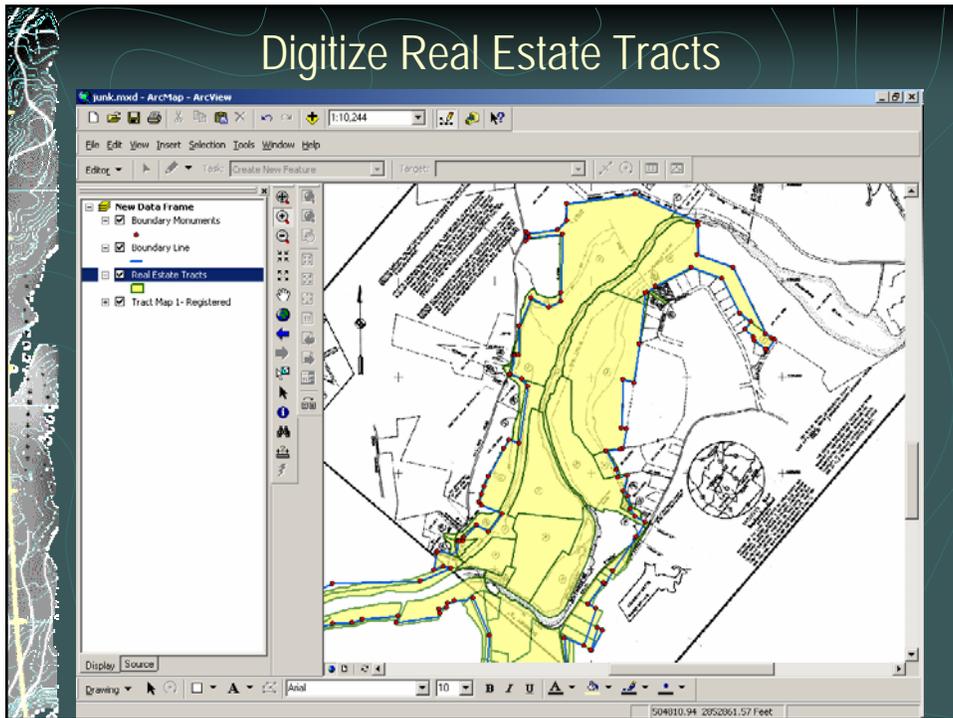
Compare to Boundary Line and Monuments



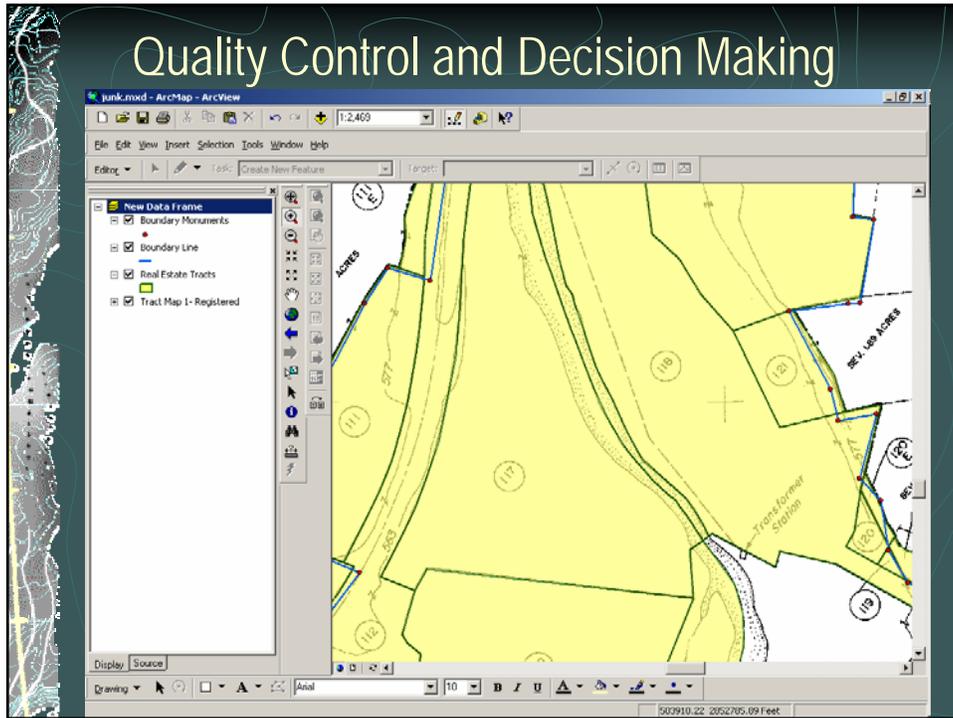
A Closer Look



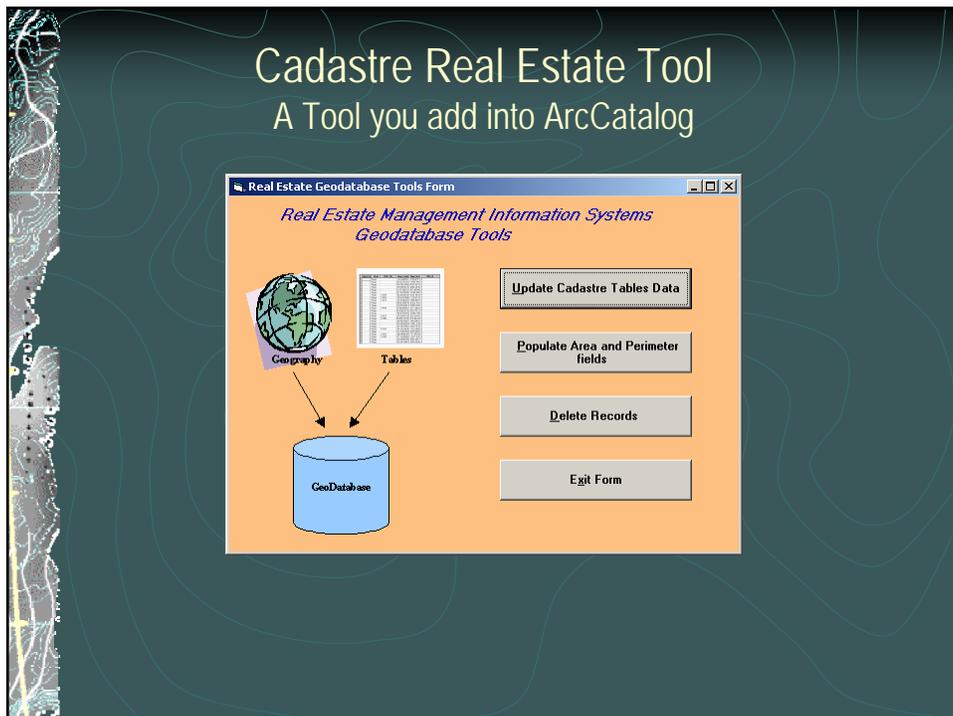
Digitize Real Estate Tracts



Quality Control and Decision Making



Cadastre Real Estate Tool A Tool you add into ArcCatalog



You connect to REMIS through Oracle Client

Real Estate GeoDB Update Form

Data Source Name (DSN): NAEREGIS

User ID (UID): eBeppmtyw

Password (PWD):

Input the path where the personal geodatabase is located at:

Enter the abbreviated project name (uppercase only):

Select the abbreviated state related with the project (uppercase only):

Update Geodatabase

Exit

Result is a Personal Geodatabase with your Tracts and some of the REMIS Fields

ArcIMS

GIS for the Intranet

ArcIMS Features

Using a web browser such as Internet Explorer, users can access, display, query and analyze data from multiple sources including Web data, local shapefiles, ArcSDE layers, and images.

Huntington County, Indiana

Refresh Map

Layers

Visible Active

- Bridges
- Road Centerlines
- Street Names
- Edge of Pavement
- Rights-of-way
- Parcels
- Subdivisions
- Population
- Property Codes
- Zoning
- Livestock Operations
- Land Use
- Soils
- Hydrology
- Hydrology Names
- Water Quality Test Locations

Rec	PIN	Right of Way
1	0030001900	F

Identify

Map: 383370.06, 2043440.8 -- Image: 517, 313 -- ScaleFactor: 18.68823900051319



How Does ArcIMS Benefit You?

- Access GIS data through an easy-to-use interface.
- Field and Main Office personnel can simultaneously view and discuss GIS data.
- No software to install.
- No training required.



Creating an ArcIMS Web Site

No programming is required for simple sites. Simply create a map service, design the web pages, and publish. Wizards and templates guide the ArcIMS developer through tasks for authoring and publishing maps. More advanced sites can be developed through programming.

ArcIMS Viewer - Microsoft Internet Explorer

Address: http://webmaps/website/Elkins_UK_HTML/viewer.htm

ArcIMS Viewer

Map created with ArcIMS - Copyright (C) 1992-2002 ESRI Inc.

Rec	FID	#SHAPE#	TYPE	LEVEL	NAME	NAMEPRE	NAMEDIR	CODE	NATION	CNTRYNAME	PROVINCE	PROVNAME	UN
1	5281	[point]	13	1	Watford				44	United Kingdom	15	Hertfordshire	1

Refresh Map

Identify

Map: -25478.35 -1308875.63 -- Image: 218_25 -- ScaleFactor: 195.56375920601042

OakMapper - Sudden Oak Death in California - Microsoft Internet Explorer

Address: http://hilda.espm.berkeley.edu/website/OakMapper/viewer.htm

OakMapper: Monitoring Sudden Oak Death in California

Monitoring Sudden Oak Death in California

SEARCH BY COUNTY

SEARCH BY ZIP CODE

SEARCH BY CONGRESSIONAL DISTRICT

SEARCH BY USGS TOPO QUAD 1:100,000

SEARCH BY USGS TOPO QUAD 1:24,000

NAVIGATION: Zoom In, Zoom Out, Zoom Back, Zoom to Full Extent, Zoom to Active Layer, Pan

IDENTIFY/QUERY: Identify, Query, Find

SELECT: Select by Rectangle, Select by Line/Polygon, Clear Selection

OTHER TOOLS: Add Topo, Clear Topo, Measure, Find, Clear, Hyperlink

Layers

- SOD confirmations reported by CDFA or UCD/UCB as of 2/14/02
- Hyperlinks to Images
- Symptomatic Trees Submitted Via OakMapper
- Major California cities
- 1/4 mile buffer around SOD confirmations
- Areas suspected of having SOD
- Areas of tree mortality from aerial survey
- County Boundary
- Federal, State and Regional Parks
- Foliar Host Species Affected (Bay Laurel, Bigleaf Maple, Buckeye, Madrone, Manzanita, Hualeberry, Rhododendron, Toyon, CA Honeyuckle, CA Coffeeberry)
- Tree Host Species Affected (Coast Live Oak, Tan oak, Black Oak)
- Counties with confirmed SOD
- Counties

Find String: Find String

Monitoring SOD Home | California Oak Mortality Task Force | CAMFER Home

OakMapper © 2002 by UCB CAMFER, developed by Karin Tuxen using ESRI's ArcIMS. E-mail with questions and comments.

ArcIMS ArcMap Server

Using the ArcIMS ArcMap Server, any ArcGIS map document can be published on the Intranet. ArcIMS ArcMap Server allows ArcGIS users to take advantage of all the advanced data access and cartographic capabilities of ArcGIS. Create a map document in ArcMap, and publish it on the Intranet.

Question/Comments

