

# Conservation and Transportation Arkansas Pilot Workshop 2006

## Session: Other Tools and Approaches

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### Who and What:

Kimberly Majerus, FHWA-Resource Center

Robert Fuhler, AHTD, Environmental Division

Shelby Johnson, AR Geog Info Office

Poster Display: Robert Reed & Max Farrell, AHTD

Handout: other references and web sites

## Topics: Other Tools and Approaches

- Factors for Integrating Decisions and Uses of Tools
- Examples: Conservation with Transportation
- Arkansas Tools & Approaches:  
Speakers: Shelby Johnson, then Robert Fuhler  
  
Poster Display in hallway: Authors,  
Robert Reed and Max Farrell, AHTD, Env Div

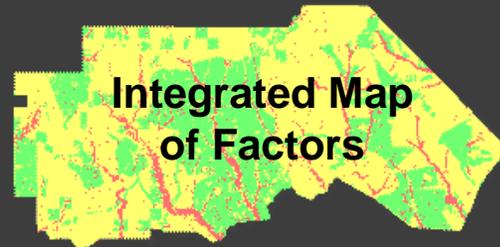


**Support for  
Transportation  
Decisions**

**Integrate Information,  
People, and Decisions**

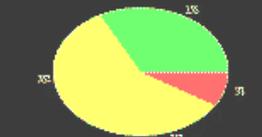


**Wildlife, Fish,  
Ecology,  
Wetlands,  
Water**



Map composite of environmental sensitivity

- 1) Least Sensitive
- 2) Potentially Sensitive
- 3) Moderately Sensitive
- 4) Most Sensitive



**Community  
Values  
and Public  
Involvement**

**Contaminants/  
Haz Waste**

**Env Methods,  
Tools,  
and GIS**

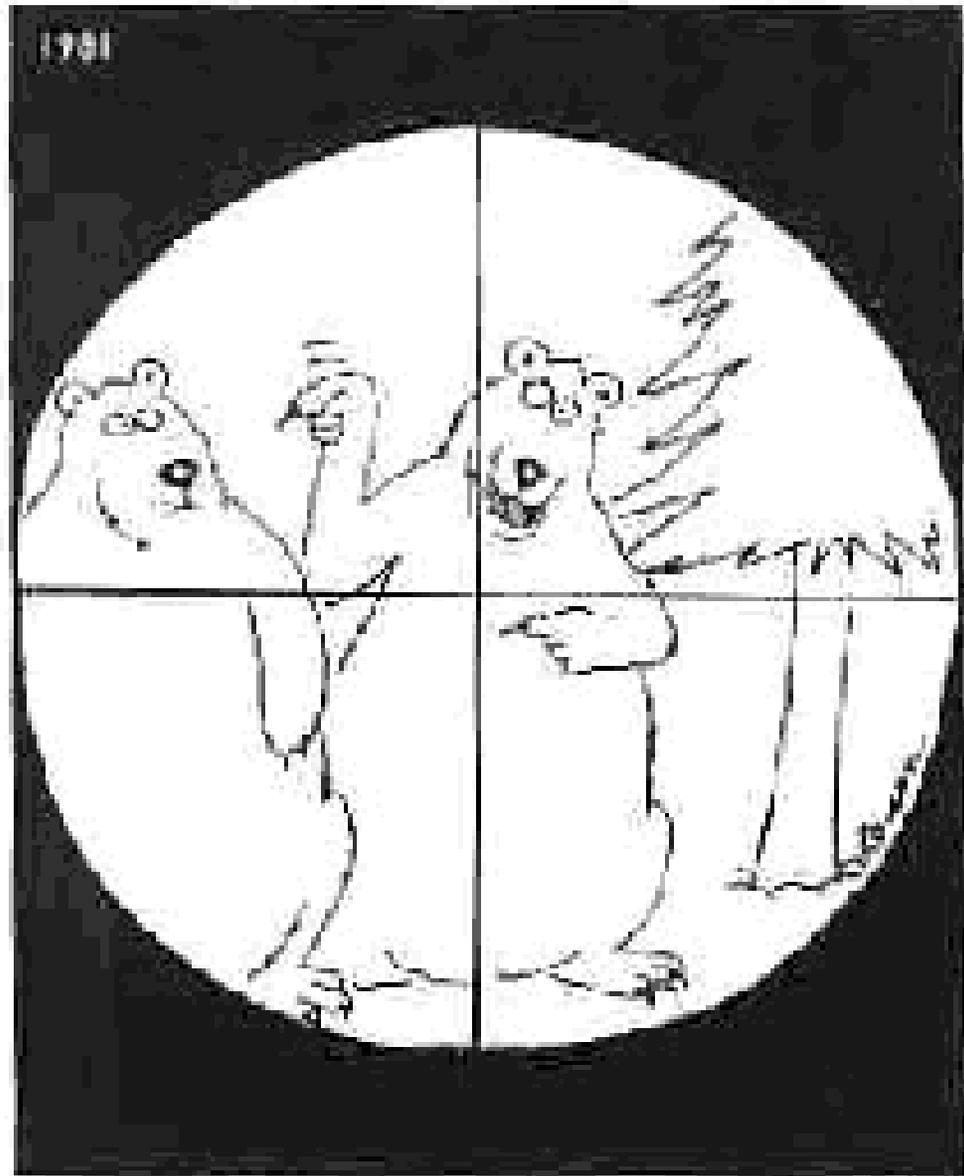
**Air Quality  
and Noise  
and other Issues**

**Cultural  
Resources  
and Tribal  
Coordination**

**Integration?**

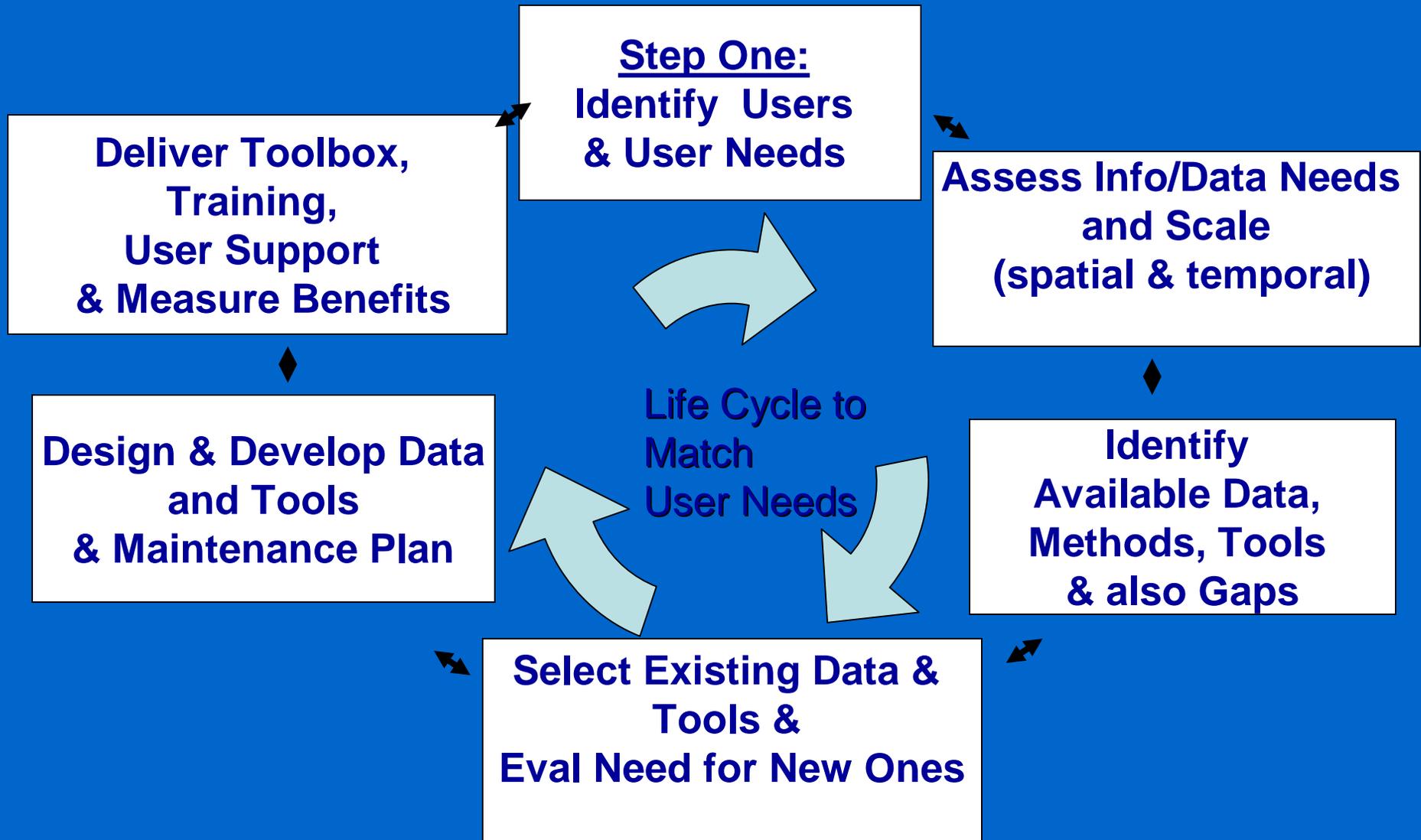
**a wildlife  
example**

*Far Side cartoon  
by Larson*



# Use and Integration of Tools – How do we get there?

## Technology Life Cycle to Match User Needs



# Based on Information Needs – What Data is Already Available? National Spatial Data Infrastructure (NSDI)

Develop, Access, Use -Data at Various Levels

Regional & National



County/Parish



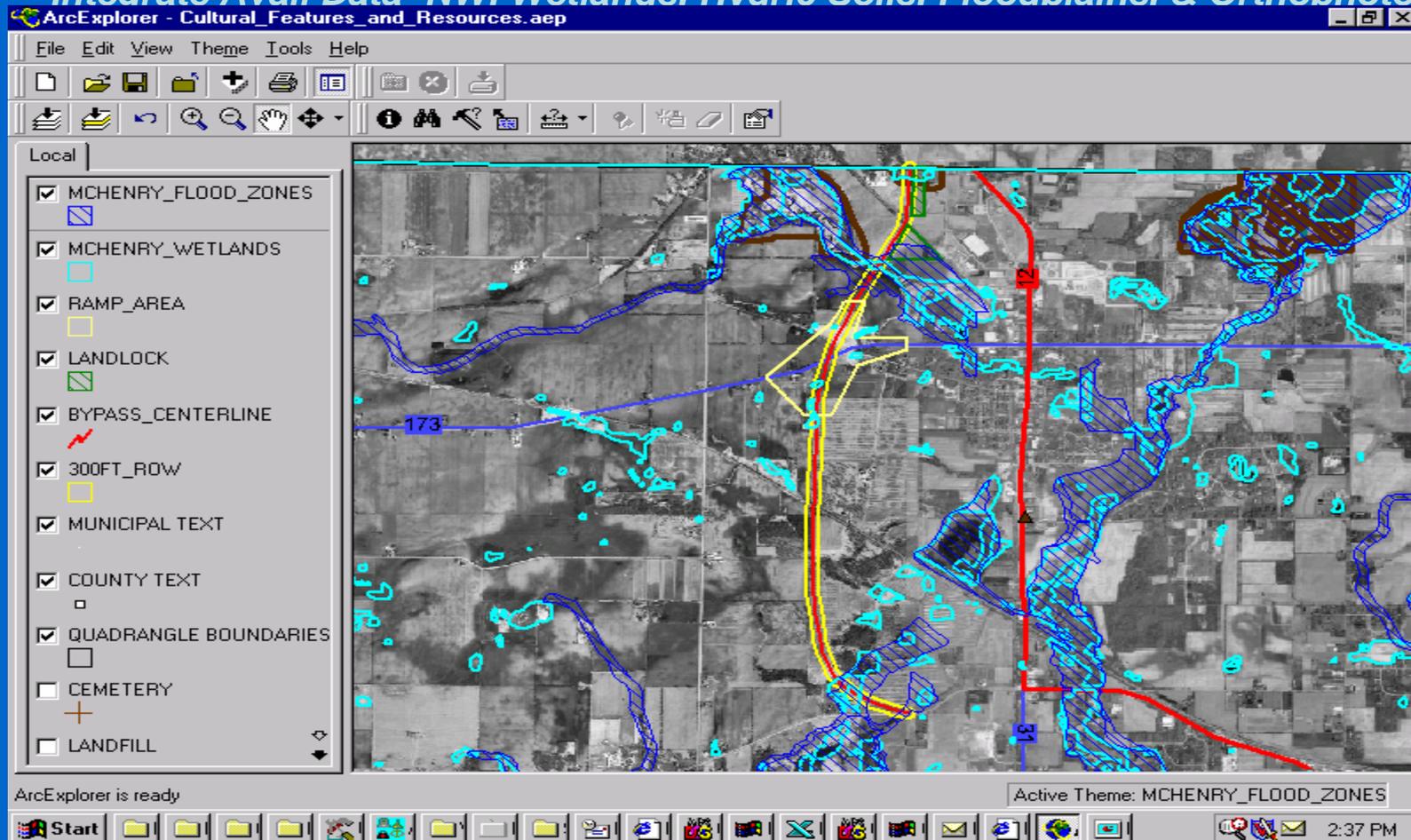
Local Data & Uses

## NSDI Available for:

- Data exchange,
- Aggregation,
- Multi-level, multi-purpose
- Analyses
- Metadata use

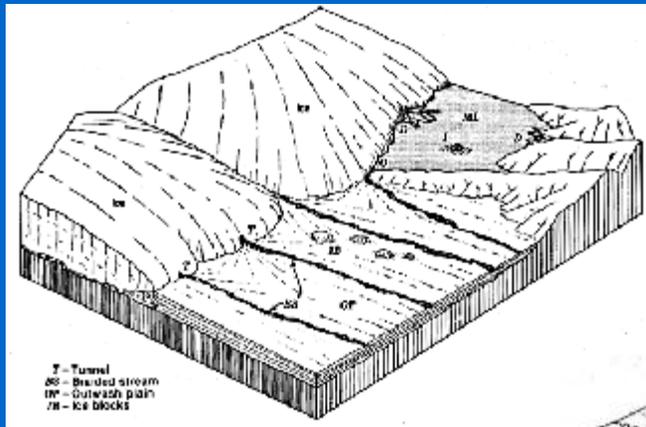
# Illinois DOT example use of NSDI Free Environmental GIS Data on Web

*Integrate Avail Data -NWI Wetlands. Hvdric Soils. Floodplains. & Orthophotos*

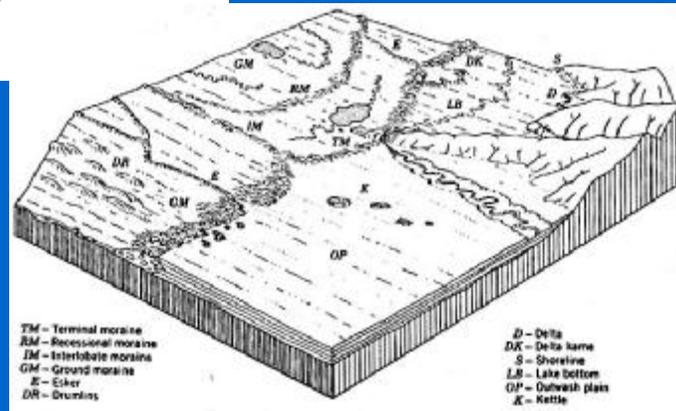


# Information for Decisions: Natural Environment, Natural Foundation

IL- 10,000 yrs ago - Landforms



Weathering through time



Existing: Oak Savannas

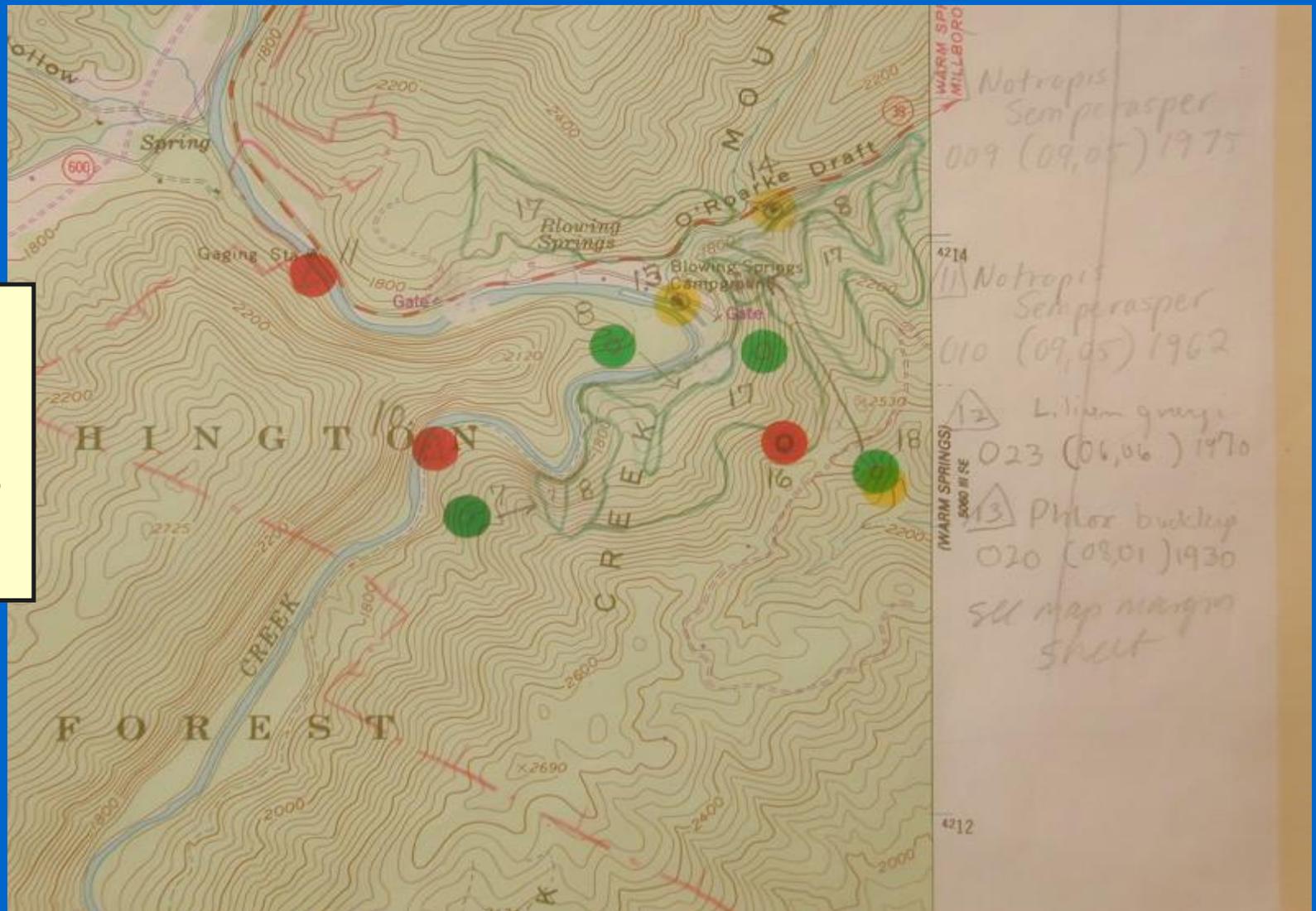


## Natural Environment

- *Topography*
- *Slope*
- *Soils*
- *Parent Material & Geology*
- *Hydrology & Drainage*
- *Vegetation (example, wetlands)*

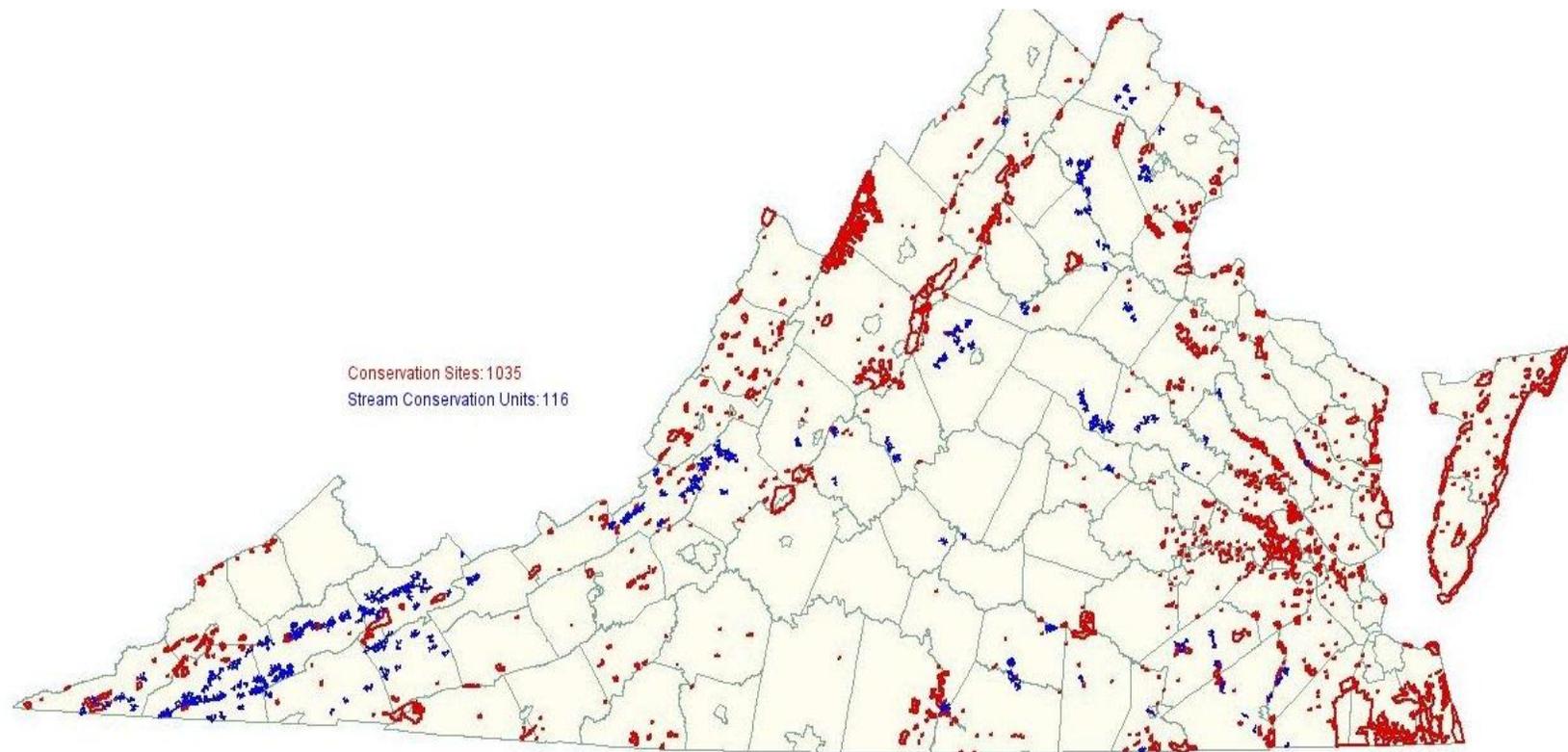
# Virginia GIS Initiatives – Natural Heritage

Paper maps before GIS



# VA DOT GIS Initiatives, and Shared Computer GIS Maps – MOA with VA Nat Heritage Program

## Conservation Sites & Stream Conservation Units



# Virginia CEDAR Project Mgmt Tool, GIS Integrator, & SERP

The screenshot displays the GIS Integrator web application interface. At the top, the browser title is "CEDAR - GIS Window - Microsoft Internet Explorer provided by VDOT". The application header includes "GIS Integrator" and navigation links for "Help", "Print", and "Errors & Omissions".

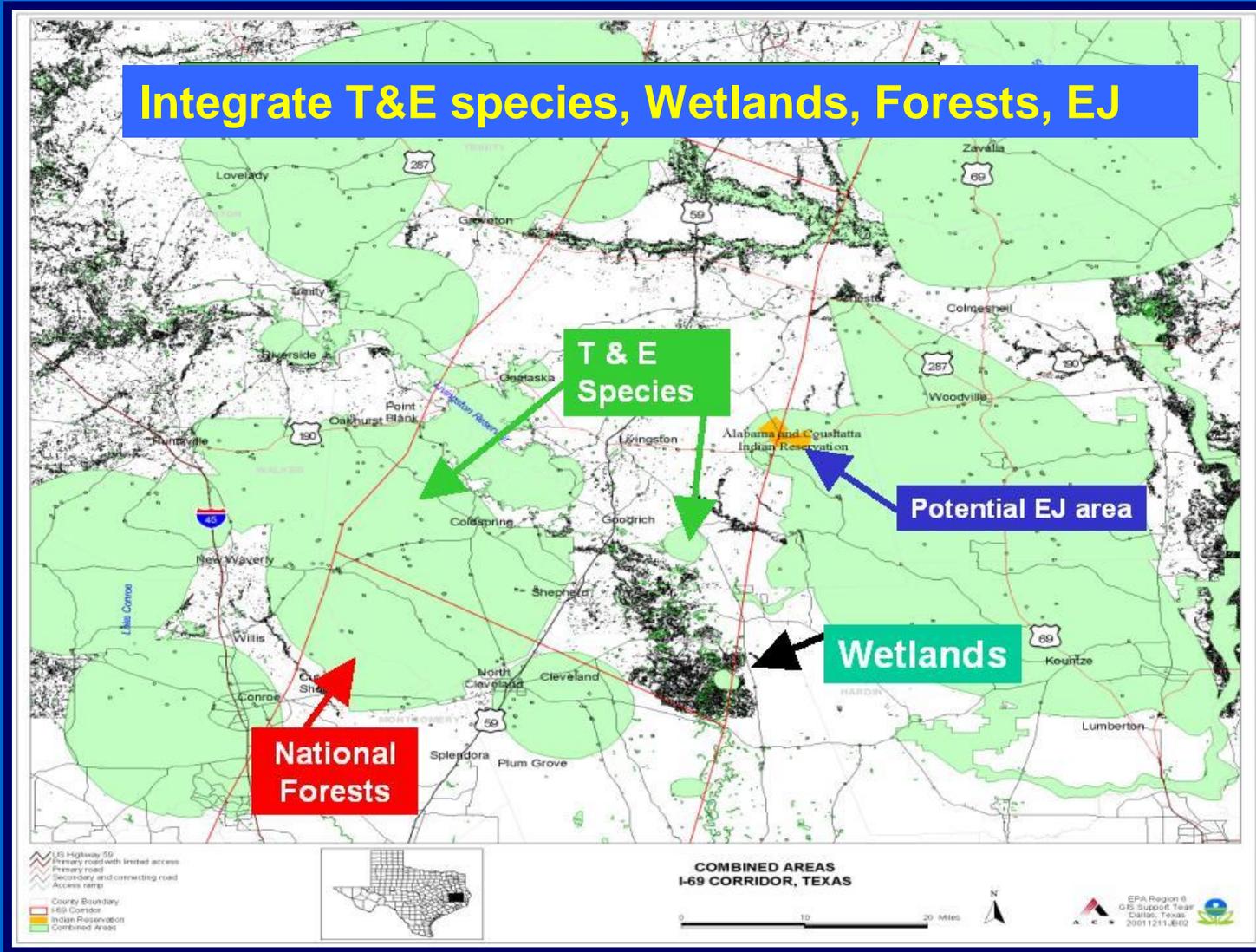
The interface is divided into several sections:

- Active Tool:** Set to "Zoom In".
- Toolbox:** A collection of icons for map navigation and analysis.
- Map Scale:** 1:30,206.
- Map:** A central map area showing a geographic region with roads (e.g., 702, 782, 781, 780, 859, 1108, 178, 29, 809, 848, 302), water bodies, and various colored overlays. A scale bar at the bottom indicates 0 to 0.63 miles.
- Layers Panel:** Located on the right, it contains a "LAYERS" tab and a "LEGEND" tab. The "LAYERS" tab is active, showing a "Select a Map Theme" dropdown menu (circled in red) and a "refresh map" button. Below these are several layer categories with checkboxes and radio buttons:
  - Roadway Network** (expanded):
    - Aerial Photography
    - VDOT Data
    - Hydrology
    - Land Management (expanded):
      - Aq-Forestal Districts
      - Conservation Lands
      - Flood Plains
      - Forest Cover
      - Quad Grid
      - Quad Sheets
      - NWI
      - Shores Situation Rpts
      - VOF Easements
    - Civil Infrastructure
    - Intermodal Transportation
    - Animals

- Layer List Help:** A legend for the layer controls:
- Red circle: An active layer.
- Grey circle: An inactive layer.
- Checked box: A visible layer.
- Unchecked box: A hidden layer.
- Partial box: A partially visible group.
- Lightning bolt: A hyperlink layer.

At the bottom left, a note states: "Map created by the ITA GIS Program, Virginia DOT."

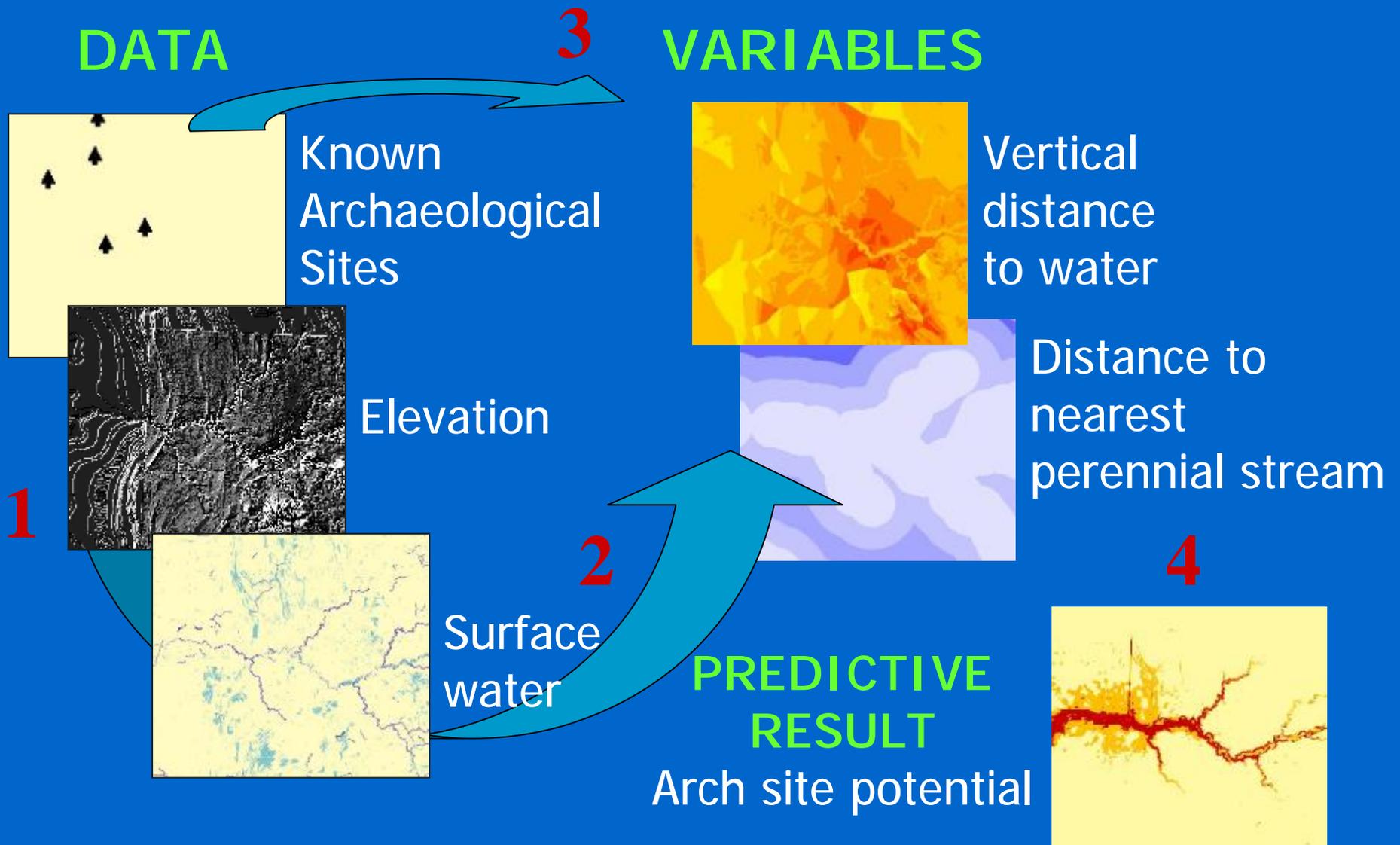
# Texas GIS Screening Tool



From US EPA's GISST animated demo

<http://www.epa.gov/4d/epa/gis/gisst/epa2a2.htm>

# Power Tools – GIS Analysis – MN GIS Predictive Modeling



# Power Tools: GIS Analysis

## IL GIS Simulation, Predictive Modeling for Impact Assessment and Mitigation

### GIS Model Simulations:

Baseline before construction

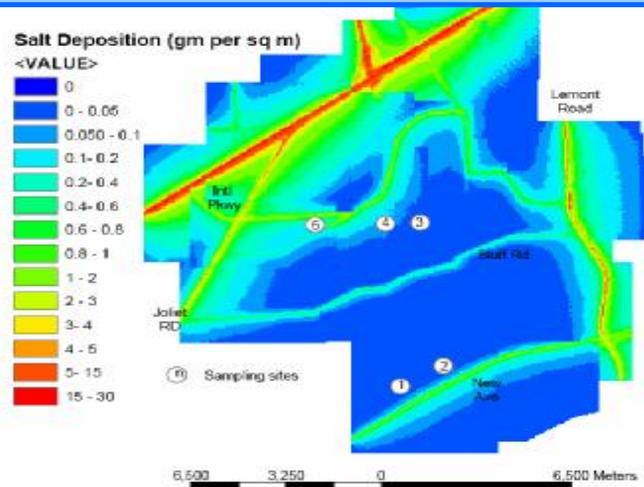
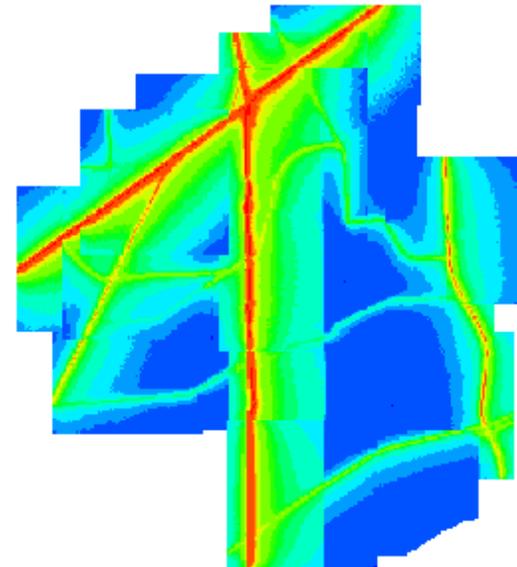


Figure 13. Model Simulations of Salt Deposition Near the Sampling Sites

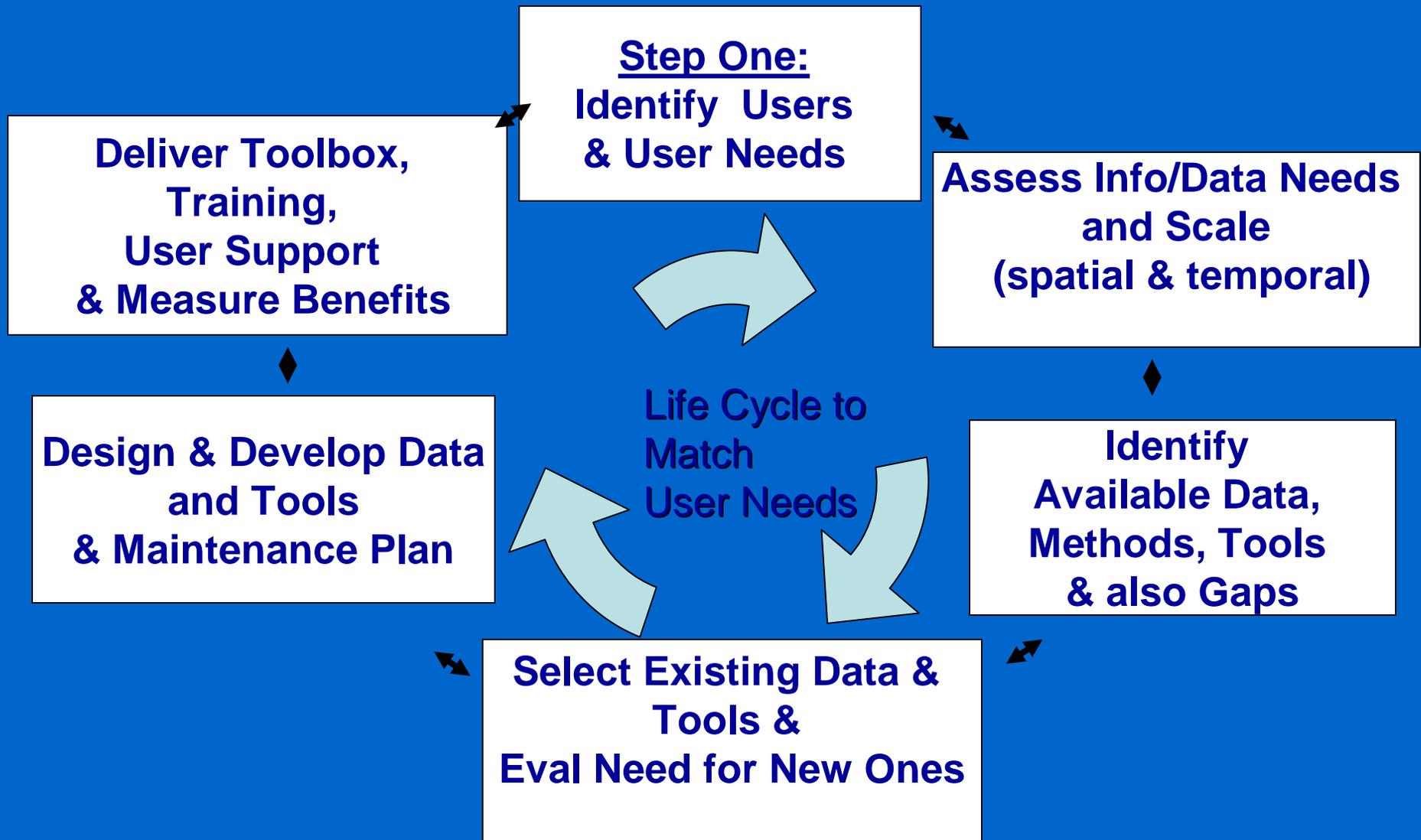
**Predicted Model Results: After construction**



↑ Proposed  
Trans

# Use & Integration of Tools –How do we get there?

## Technology Life Cycle to Match User Needs



# Based on User Needs -

## What tools are available? Identify Gaps?

### Example: Framework for tool evaluation

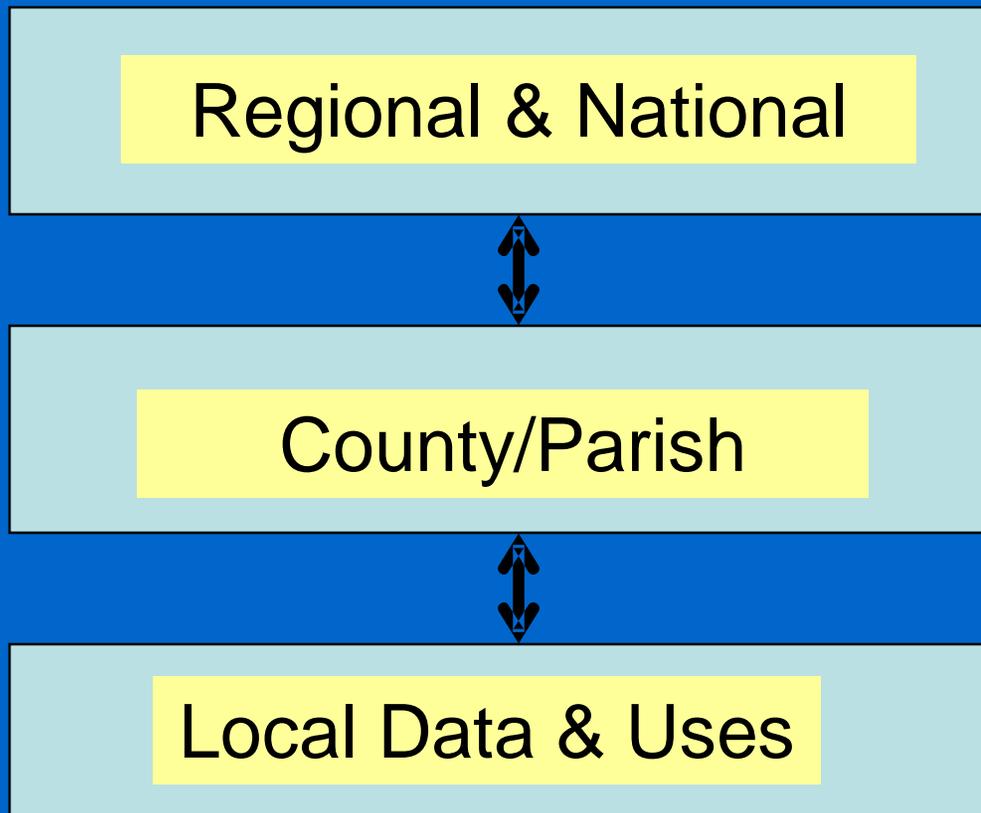
<i>Functions</i>	Information gathering and management	Goal setting and evaluation	Threat ID and impact analysis	Threat mitigation analysis	Conservation area selection	Ecosystem Management
<i>category</i>	ID planning boundaries Ecosystem process models Element selection Element requirements Include confidence info Set ecological goals Set economic goals Include multiple stakeholders Allocate goals	ID threats to eco goals Impact analysis on eco viability ID threats to econ goals ID compatible land-use	ID restoration areas Reserve scenarios	Scenario comparison Cost/benefit analysis Stakeholder involvement Implementation plan support ID EM indicators Monitoring plan	Implementation plan Implementation budget calculation Monitoring indicators Implementation plan	Evaluation and monitoring Evaluation and adaptive mgt

By NatureServe/Packard Foundation 2004

# For information needs & uses— for AR

What info/data is available?

Ways to make data avail/share?



## • GeoStor for AR

• AR Geographic Information Office

• NSDI ([www.geo-one-stop.gov](http://www.geo-one-stop.gov))

• Other offices

• Other agencies

• Other sources

• Data Collection Needed?

# NEXT -- Arkansas Highlights: Other Tools and Approaches

**Shelby Johnson** – AR Geographic Information Office,  
“GeoStor, the Natural State’s GIS Data Clearinghouse”

**Robert Fuhler** – Environmental Division, AHTD, Envir Div

“Environmental Cursory Reviews: Streamlining through  
Collaboration and Technology“

Poster by Robert Reed and Max Farrell, AHTD, Env Div:  
“The Technology of the Ivory-billed Woodpecker Survey:  
State and Federal Agencies Work Together to Apply GIS  
and GPS to Search for a Rare Bird“