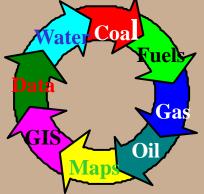


### Dan Carey -- carey@uky.edu





## Kentucky Geological Survey The University of Kentucky

"Earth Resources—Our Common Wealth"



Www.uky.edu/KGS/

# mcrawford@uky.edu



# **KGS Research Projects Using GIS**

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# Maps and GIS Research Kentucky Geological Survey site - Windows Internet Explorer Maps and GIS Research Kentucky Geological Survey site - Windows Internet Explorer Maps and GIS Research Kentucky Geological ...

#### **Digital Mapping Program**

Kentucky is extremely fortunate to have 1:24,000-scale geologic maps for the entire state. These printed maps were prepared during a cooperative project with the U.S. Geological Survey between 1960 and 1978. KGS, with funding from the STATEMAP component of the <u>National Cooperative</u> <u>Geologic Map Program</u> has completed conversion of 707 geologic maps to digital GIS data sets. Products of this project, which began in 1996, are GIS data sets in ESRI shapefile format (DVGQ), new map compilations at the 1:100,000 scale, county geologic maps, and derivative map products for a variety of applications. An interactive <u>Internet map service</u> is available for creating custom geologic maps with overlays of KGS site data. For more information about the <u>digital mapping program</u> contact <u>Warren Anderson</u>.

#### Finding High-Yield Water Wells Using Remote-Sensing Techniques

KGS geologists are using remote-sensing data in a geographic information system to predict sites with high potential for subsurface groundwater in eastern Kentucky. Much of the well water in this region is associated with subvertical fracture systems. A variety of remote imagery is being used to locate lineament intersections that are potential sites for high-pressure wells. An inclined exploratory drilling method was devised to maximize results for detecting which fractures have greatest water flow. Digital lineament data are available for eastern Kentucky on CDROM. For more information contact Jim Dinger.

#### **Carbon Sequestration**

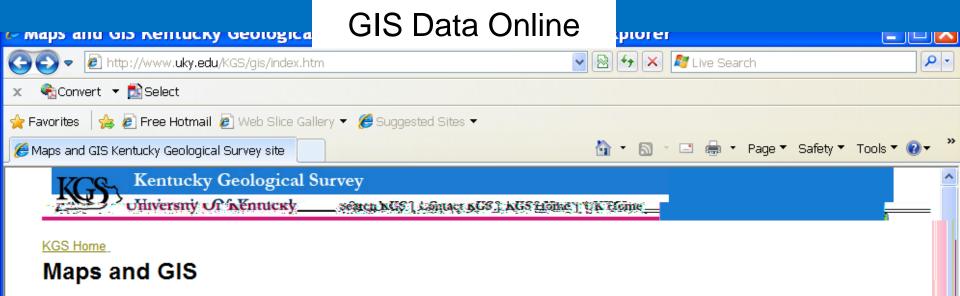
KGS is participating in three <u>Regional Carbon Sequestration projects</u> sponsored by the <u>U.S. Department of Energy</u> to provide information about long term storage opportunities for carbon dioxide emitted from electric power generating facilities. GIS data are collected at an <u>Internet mapping site</u> that integrates maps and databases from research partners into a single Web portal. The data and maps show information about <u>potential geologic</u> <u>sequestration targets</u> oil and gas reservoirs, coal beds, and saline aquifers, as well as carbon sources in the region. This project is using novel techniques to integrate the distributed GIS data for research purposes. Contact <u>Dave Harris</u> for more information.

#### Kentucky Landscape Maps

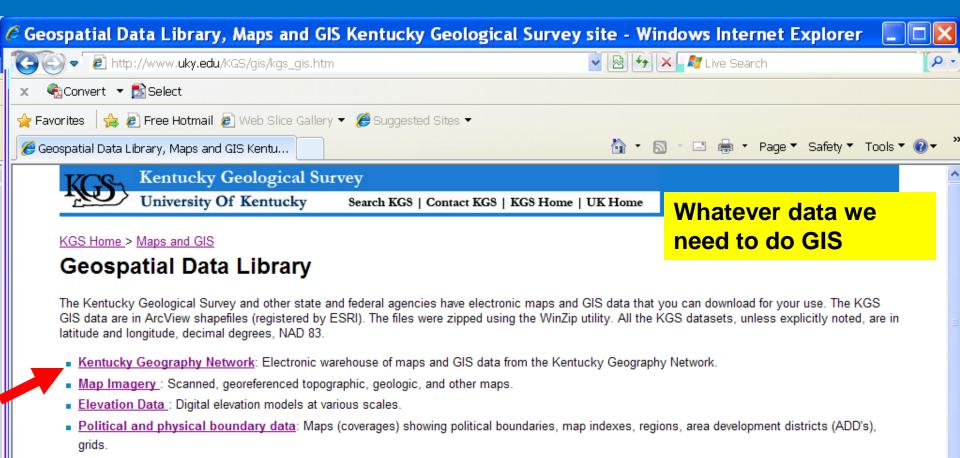
KGS personnel have been using GIS data to assist in developing maps of the Kentucky landscape. Visualizing the landscape in different ways is useful for different applications. A new physiographic map of Kentucky is being developed that delineates distinct areas of Kentucky 's topography, based on GIS themes of elevation, slope, relief, and geology. A derivative of this effort was incorporated into a new "Ecoregions Map of Kentucky," a cooperative effort among State and Federal agencies to identify areas of Kentucky with similar ecological management potential. Contact <u>Drew Andrews</u> for more information.

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- GIS Data: Links to the best GIS data we know, whether KGS or someplace else.
- <u>Maching and GIS Research</u>: Summaries of KGS GIS mapping and research projects.
- Search for Published KGS Maps and Data: Search for KGS publications, maps, and data on oil and gas, water, coal, etc.



- . Geology and Soils data : Geologic coverages of the state, oil and gas wells, coal exploration sites.
- <u>Hydrology data</u>: Hydrologic and watershed coverages, water wells, karst dye traces, wetlands, NHD streams in Kentucky.
- Transportation data : Roads and highways in Kentucky.
- <u>County basemap data</u>: From ESRI, TIGER/Line® files--roads, railroads, rivers, lakes, political boundaries, census statistical boundaries, etc., covering the entire United States by county or state.
- <u>Benchmark Data</u>: National Geodetic Survey data.
- <u>Converter</u> to convert latitude/longitude in DMS to decimal degrees.

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#### Geospatial Data Library

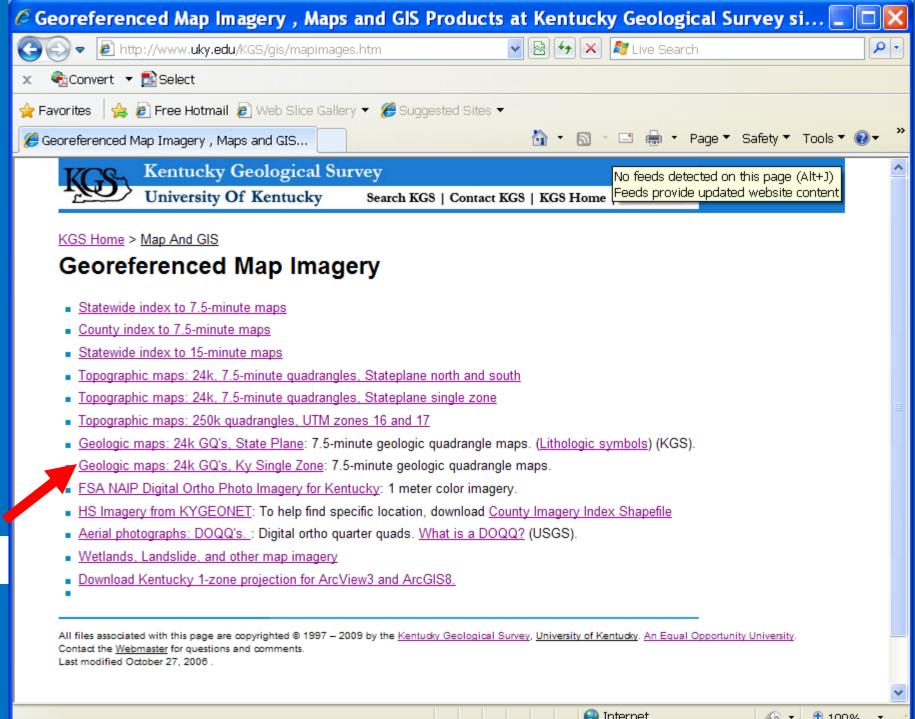
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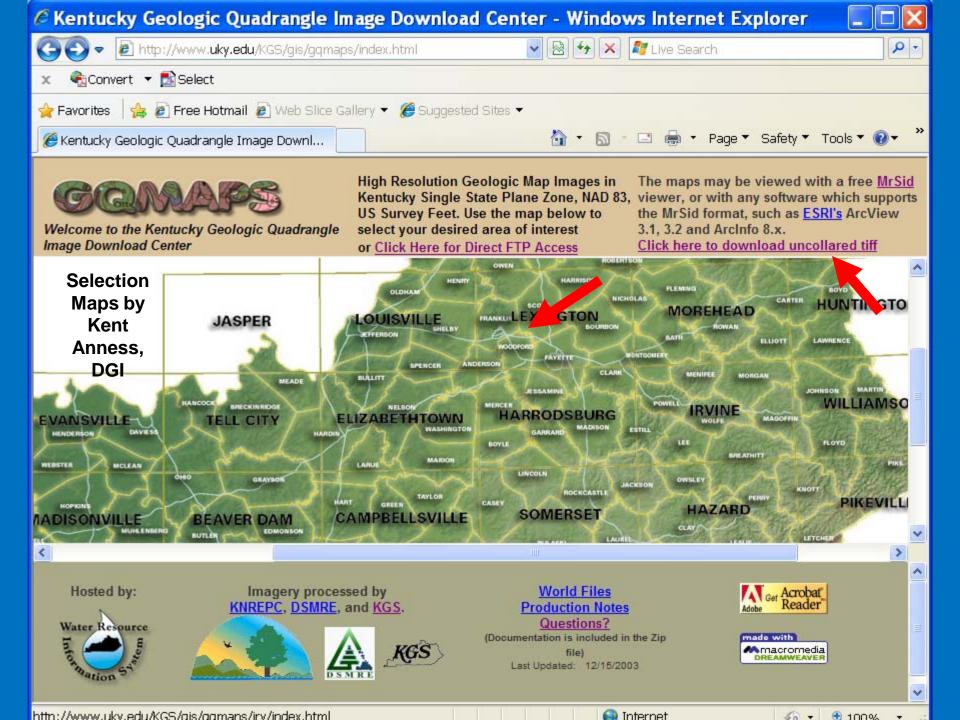
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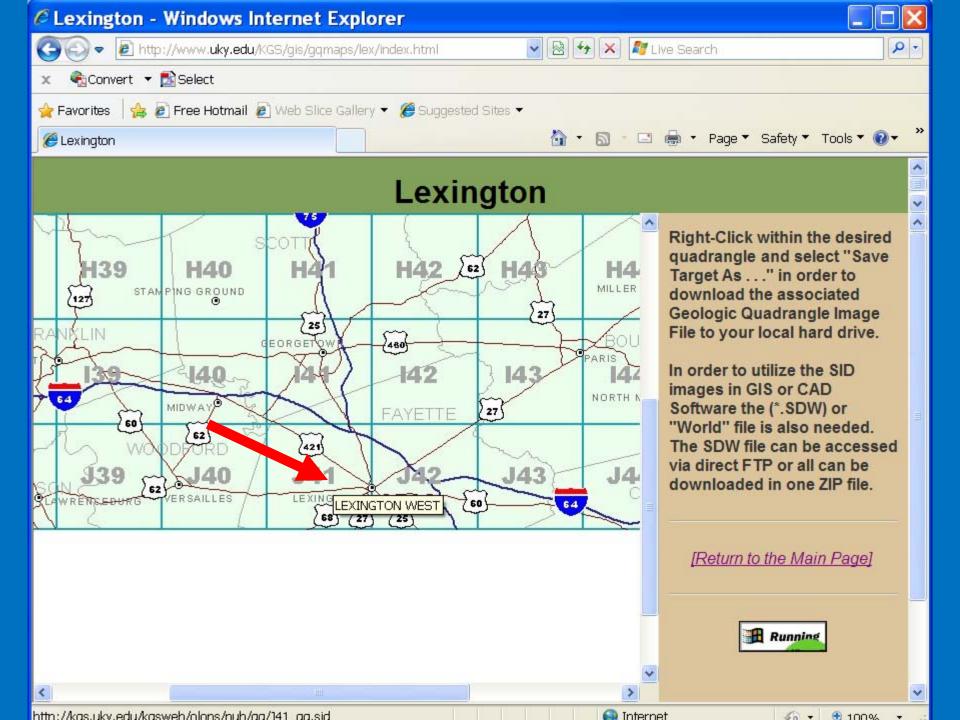
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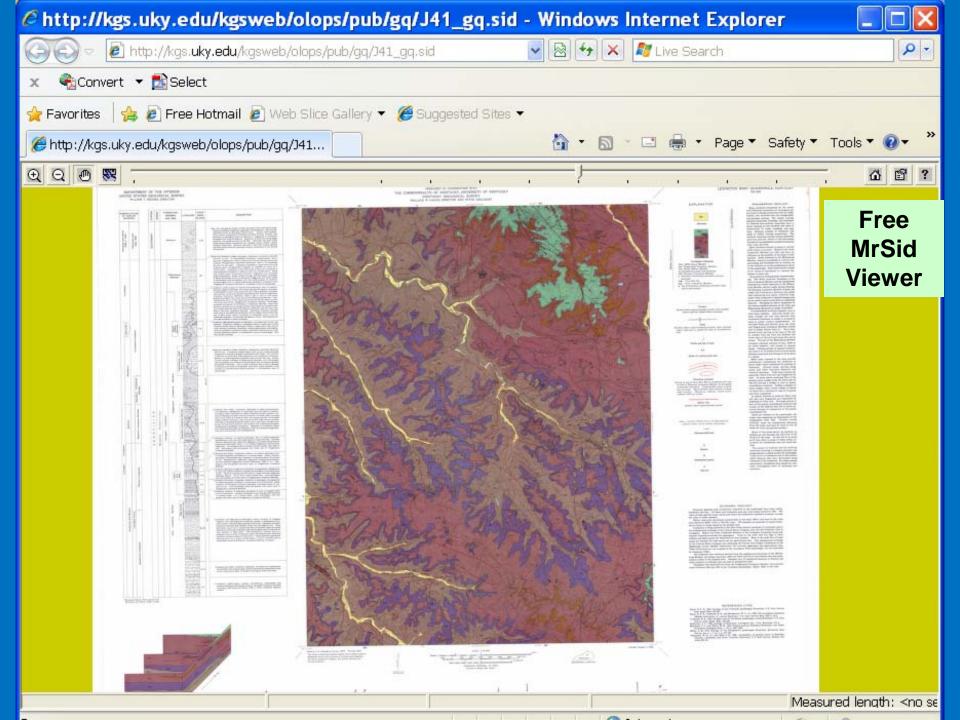
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#### Wetlands (NWIP Home)

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The maps may be viewed with a free <u>MrSid</u> viewer, or with any software which supports the MrSid format, such as <u>ESRI's</u> ArcView 3.1, 3.2 and ArcInfo 8.x.

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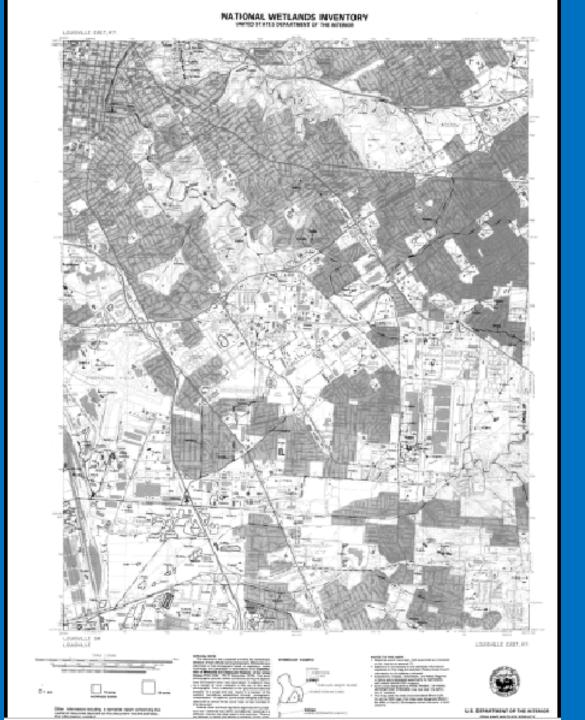


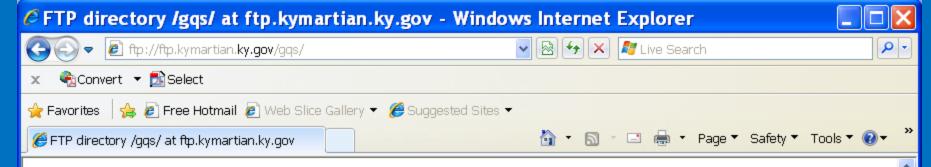
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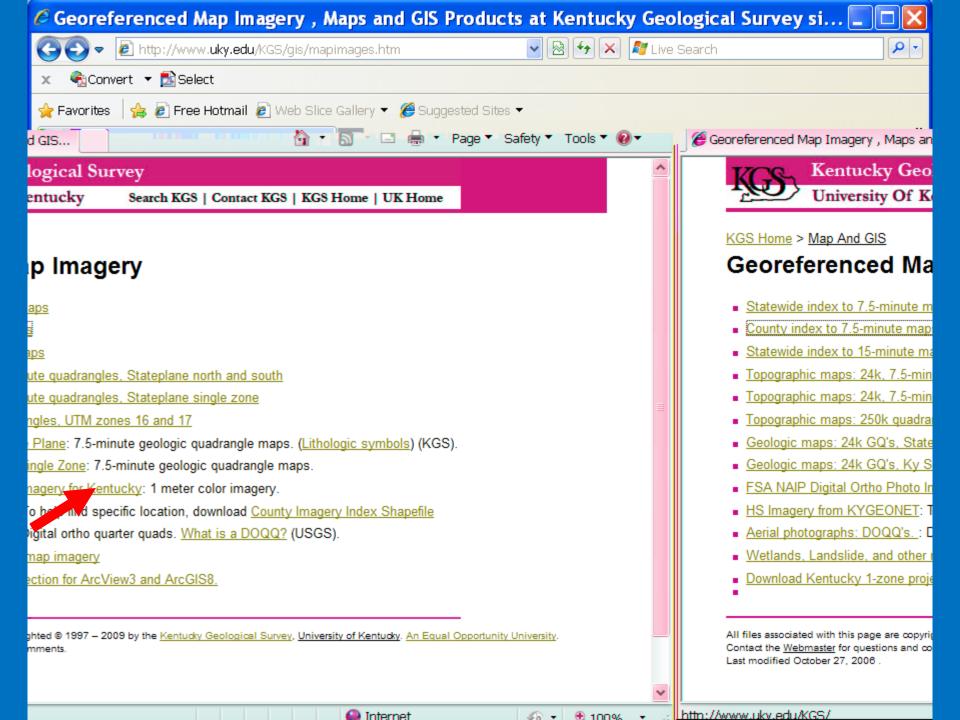
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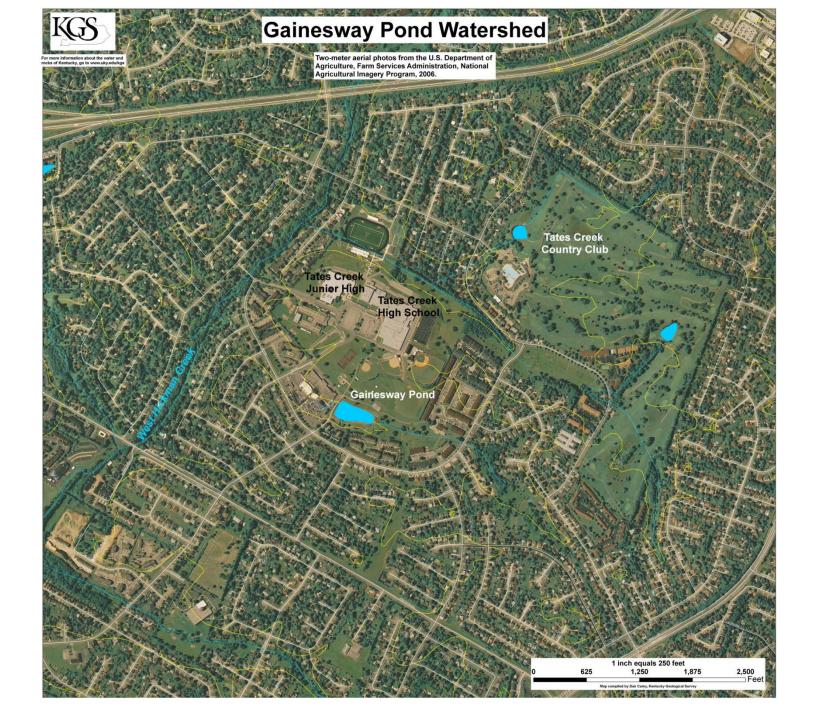
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#### Coal

Coal has been central to the Martin County economy. From 1879 to 2004, 391 million tons were produced: 202 million from underground and 189 million from surface mining. Production declined from a high of 18.1 million tons in 1985 to 6.4 million tons in 2004. Surface mining has changed the face of Martin County (left). Post-mining land uses have included a federal prison, regional airport, and regional industrial park. Construction on reclaimed areas may require measures to prevent differential settlement of foundations. Aerial photos from the U.S. Department of Agriculture Farm Services Administration, National Aerial Imagery Program, 2004.

# Martin County

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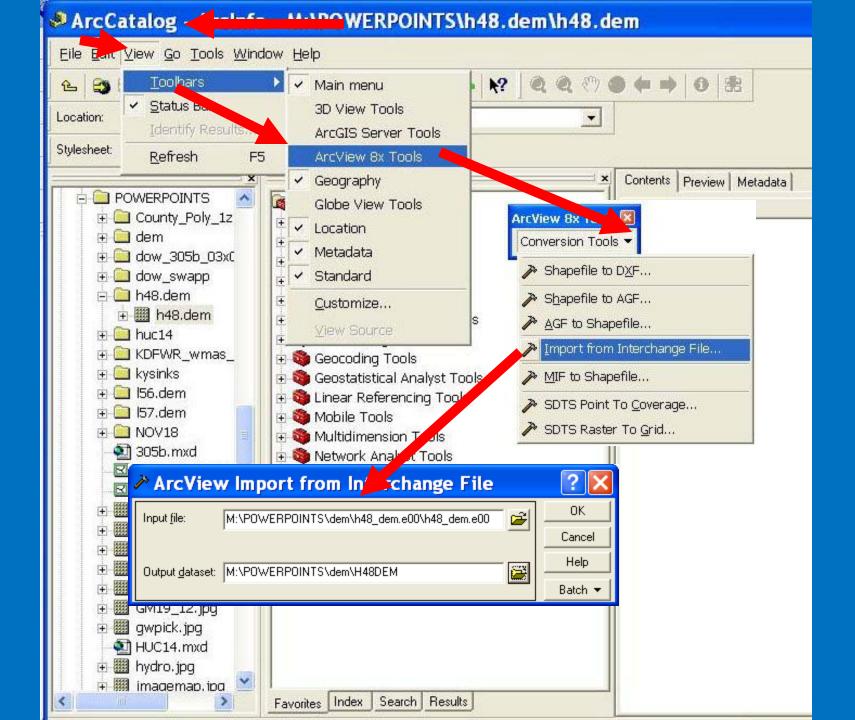








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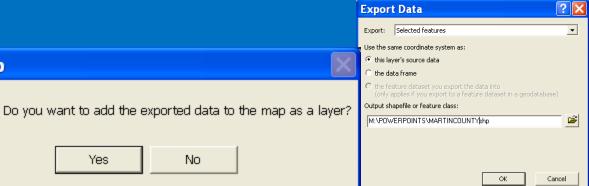


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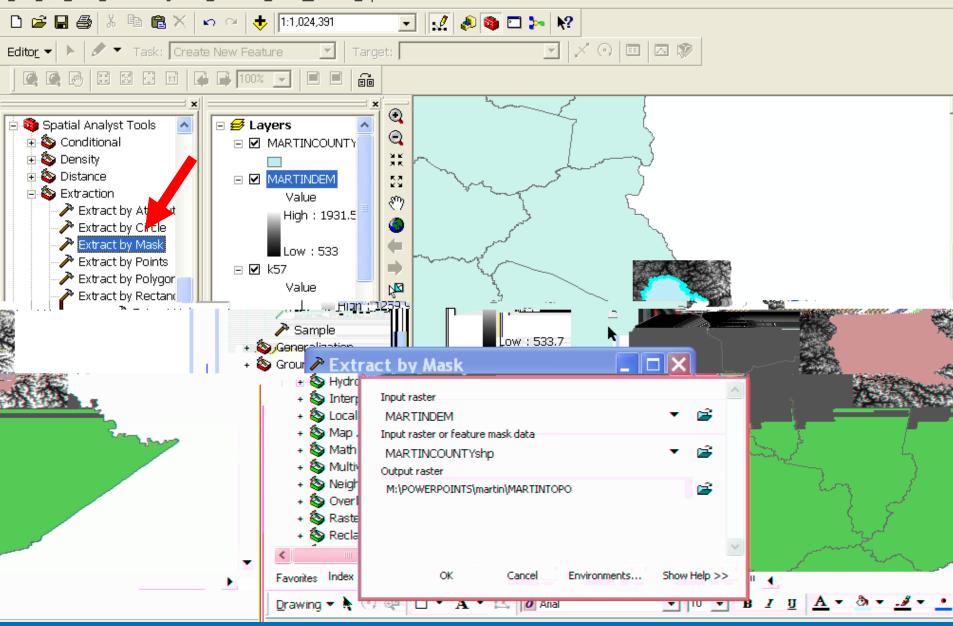
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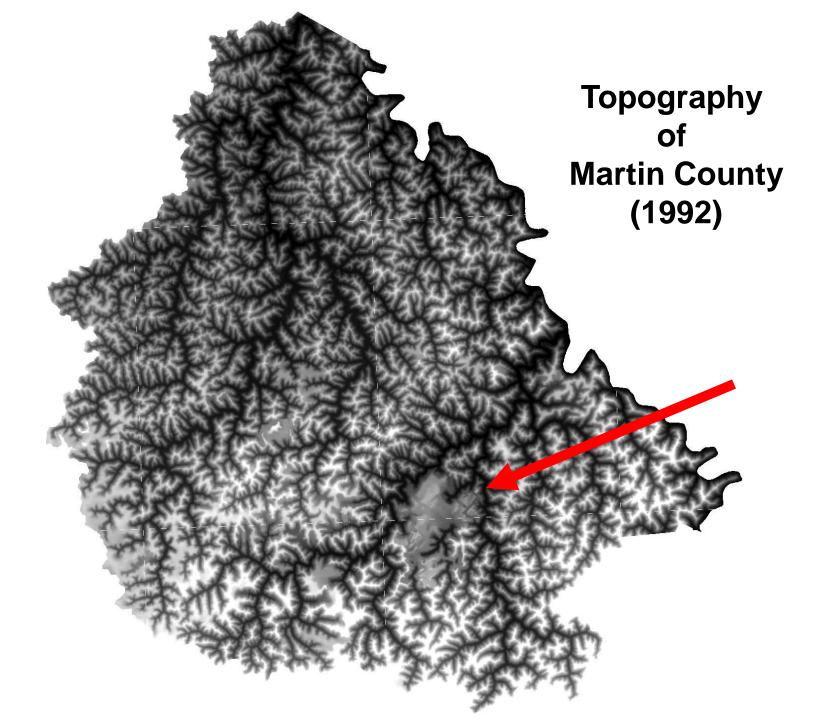


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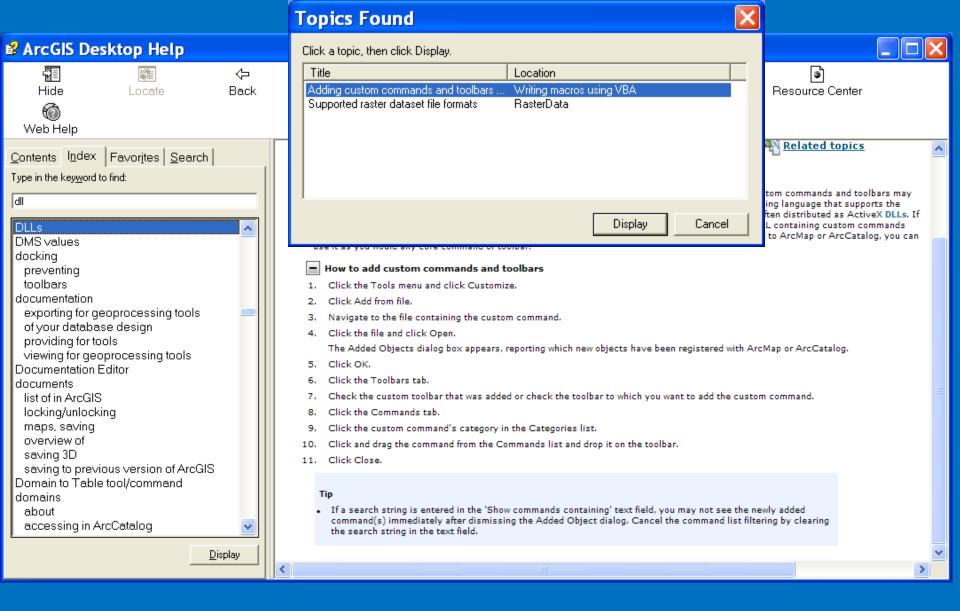
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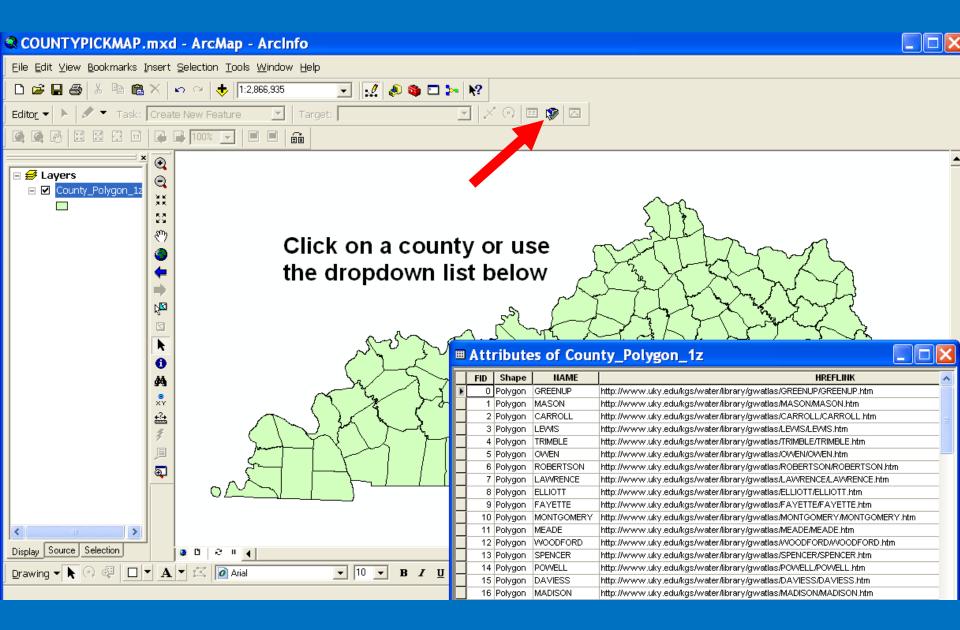
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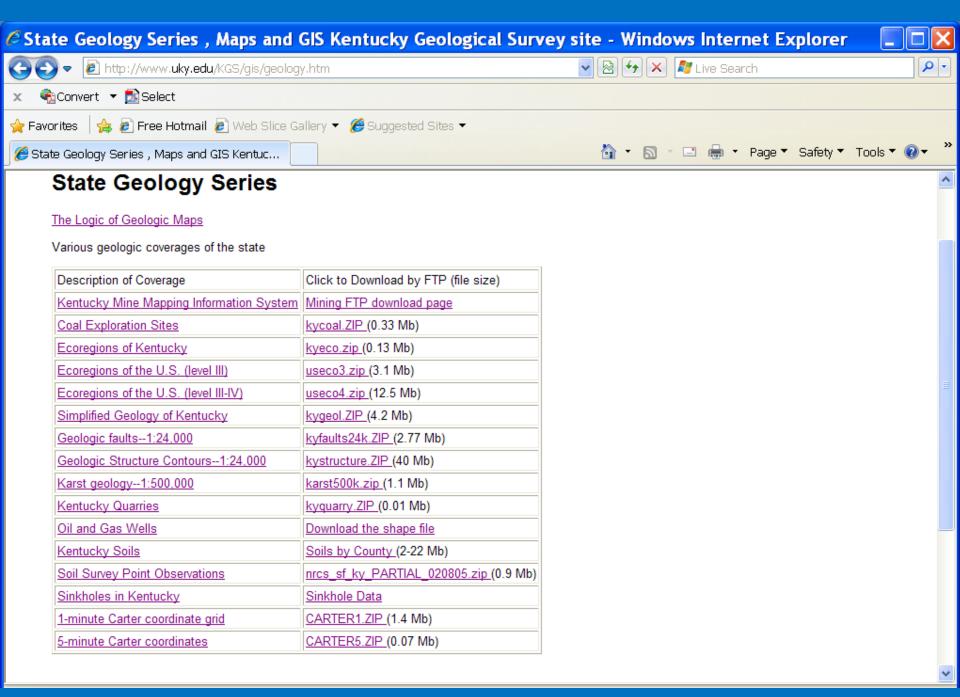
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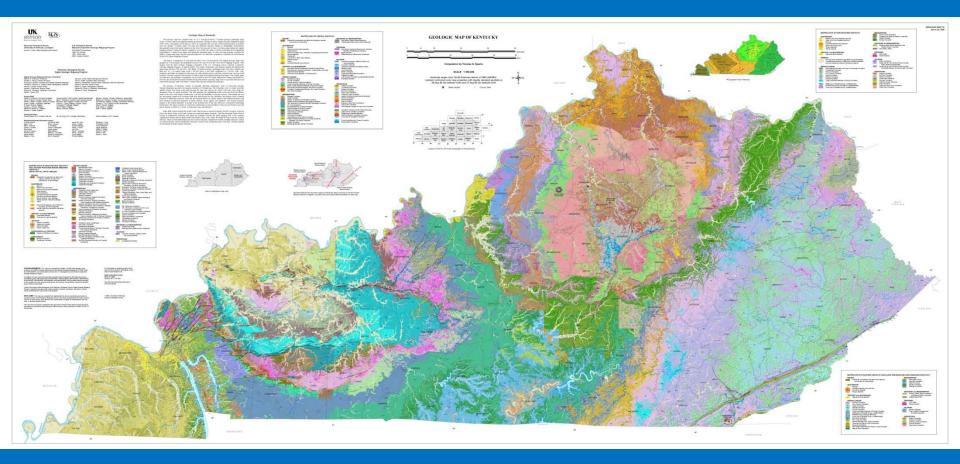
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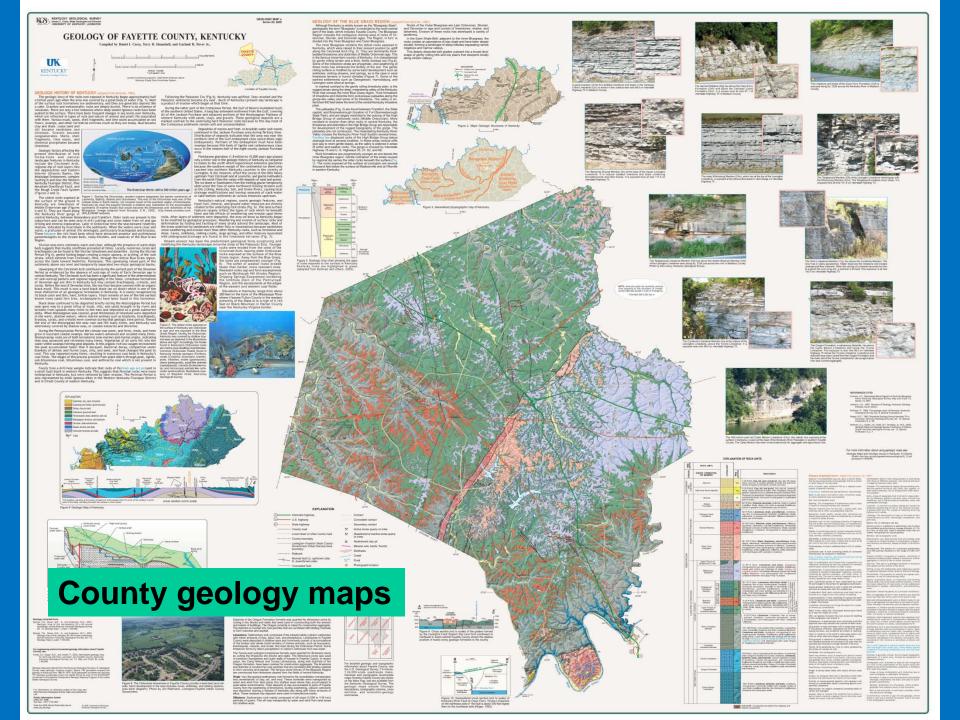
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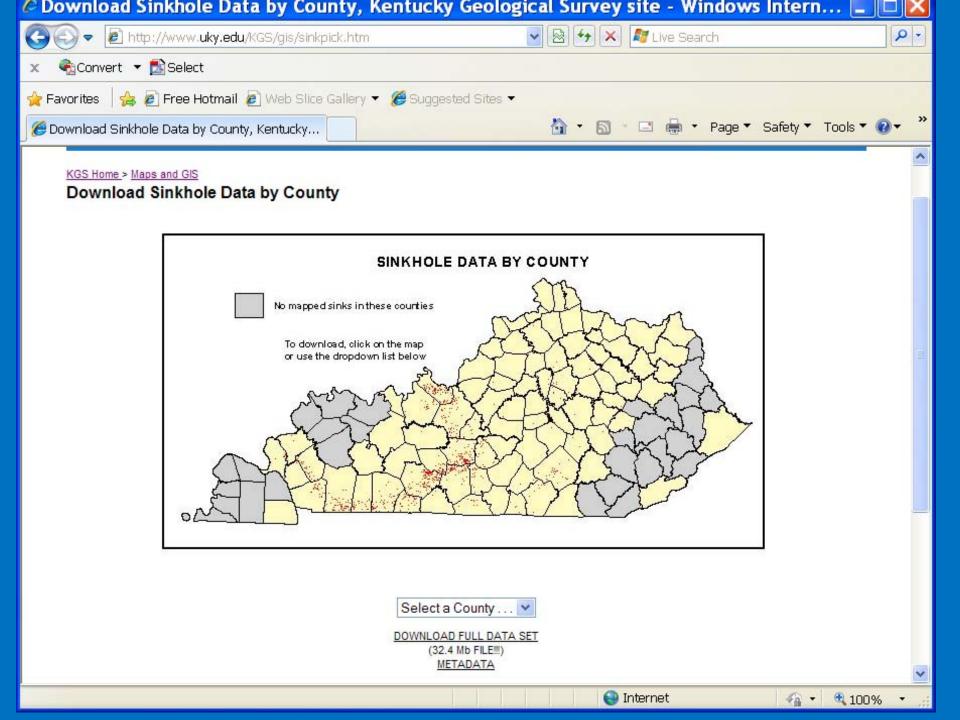
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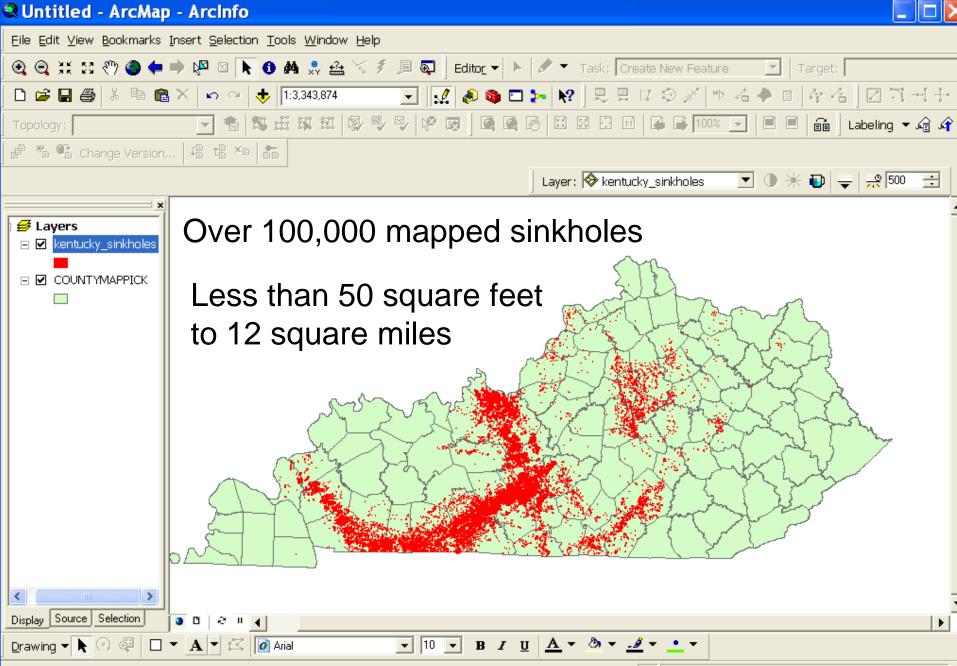


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## Mapping underground flow paths in karst with ArcGIS



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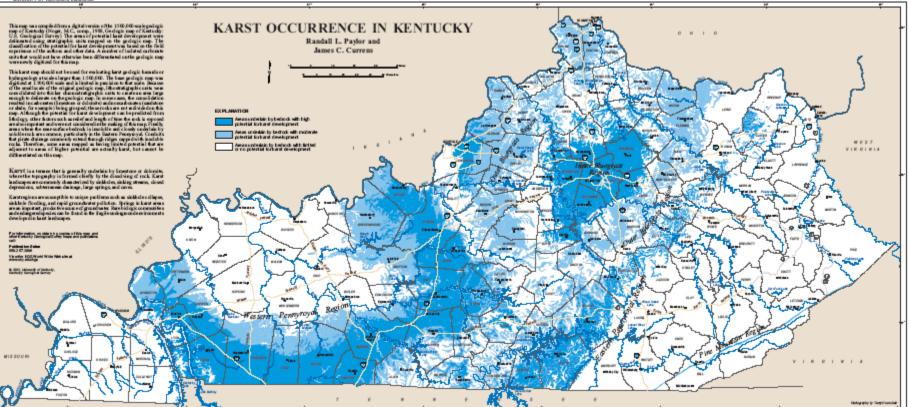
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## Mapping Karst Geology

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Wildlife Management Areas	KDFWR wmas 061603.

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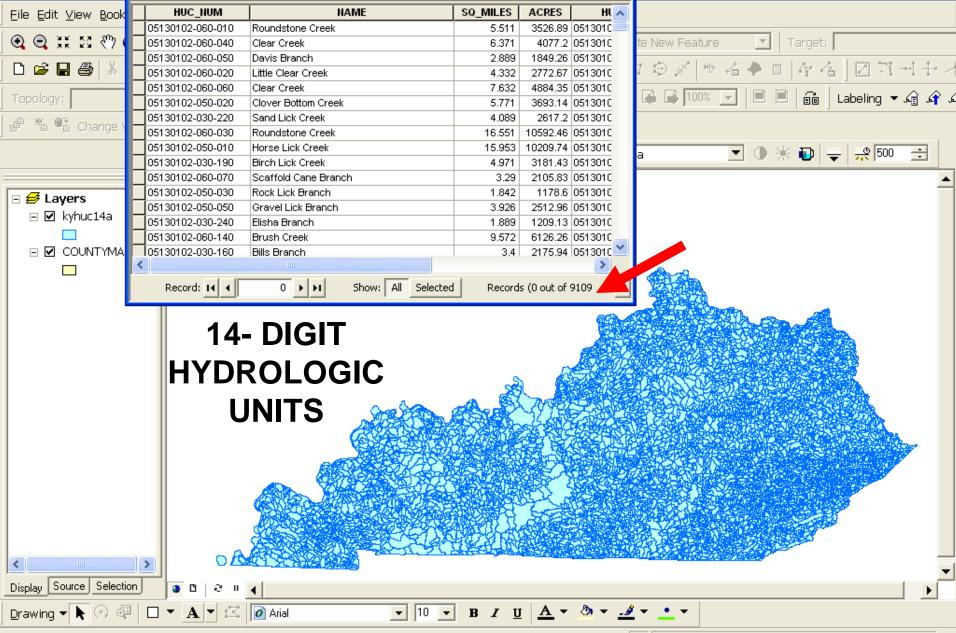
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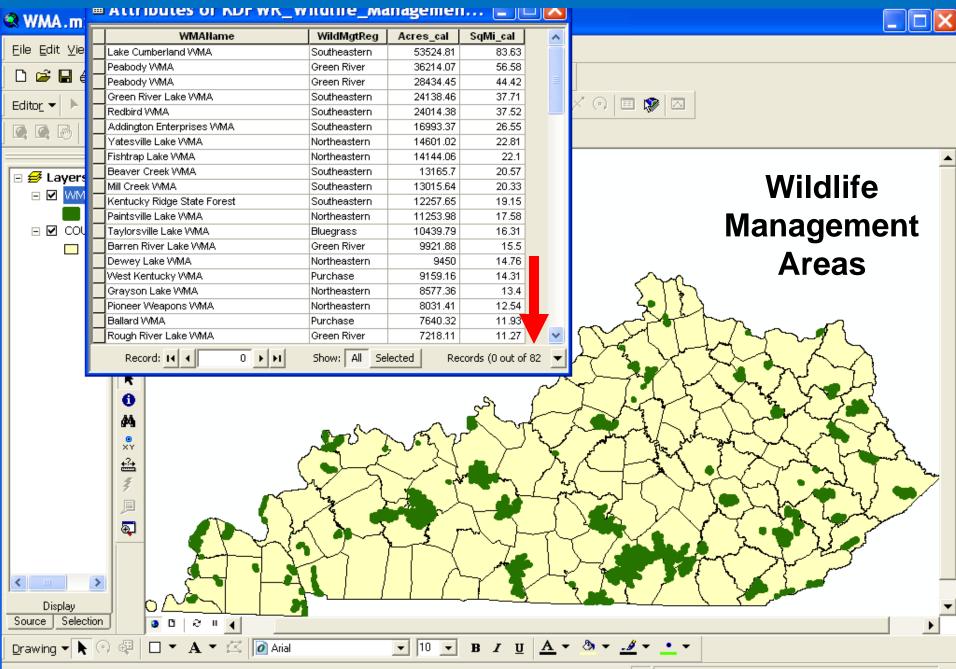
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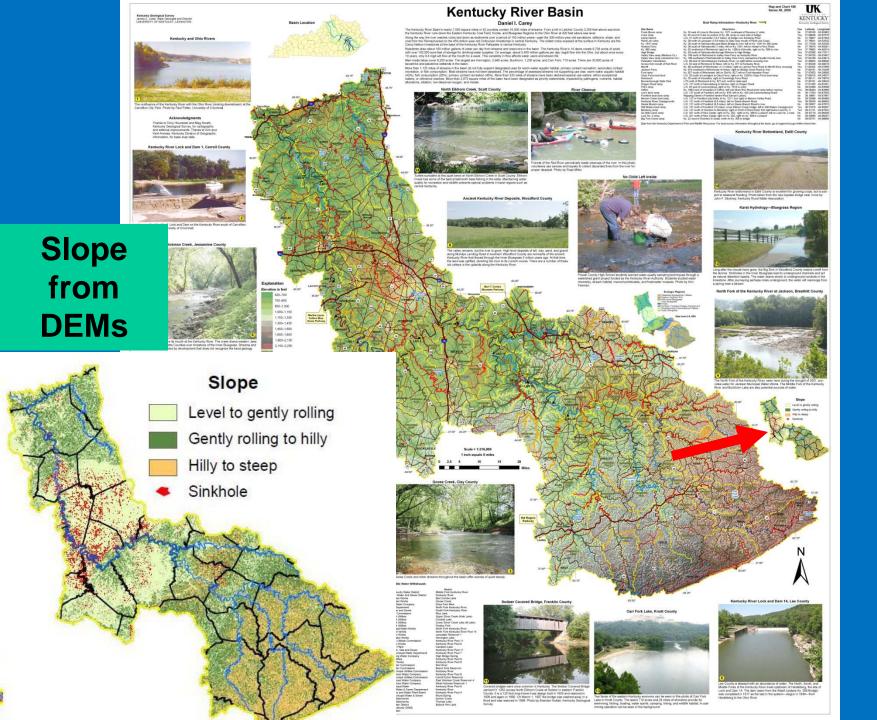


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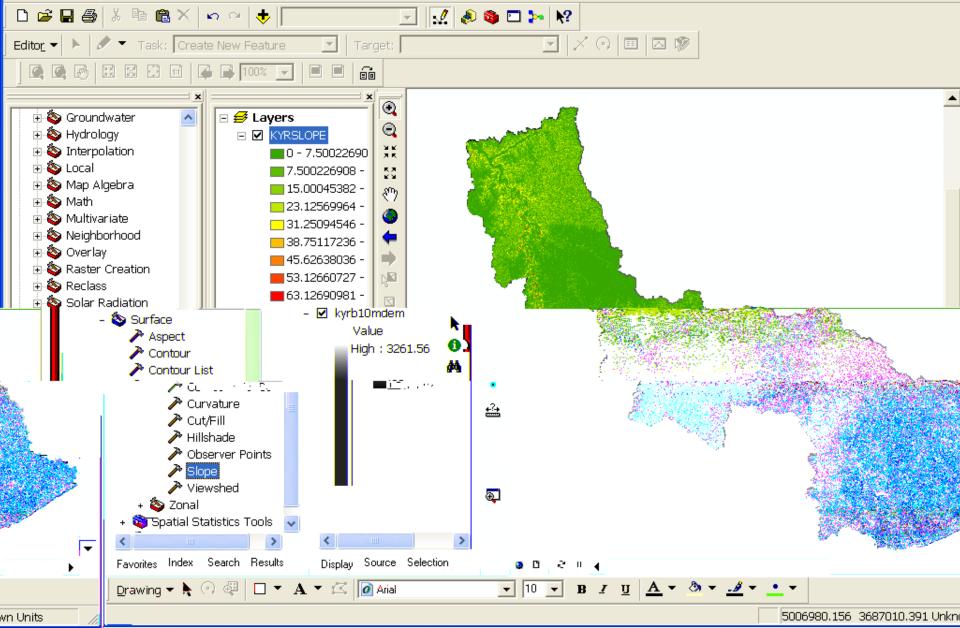
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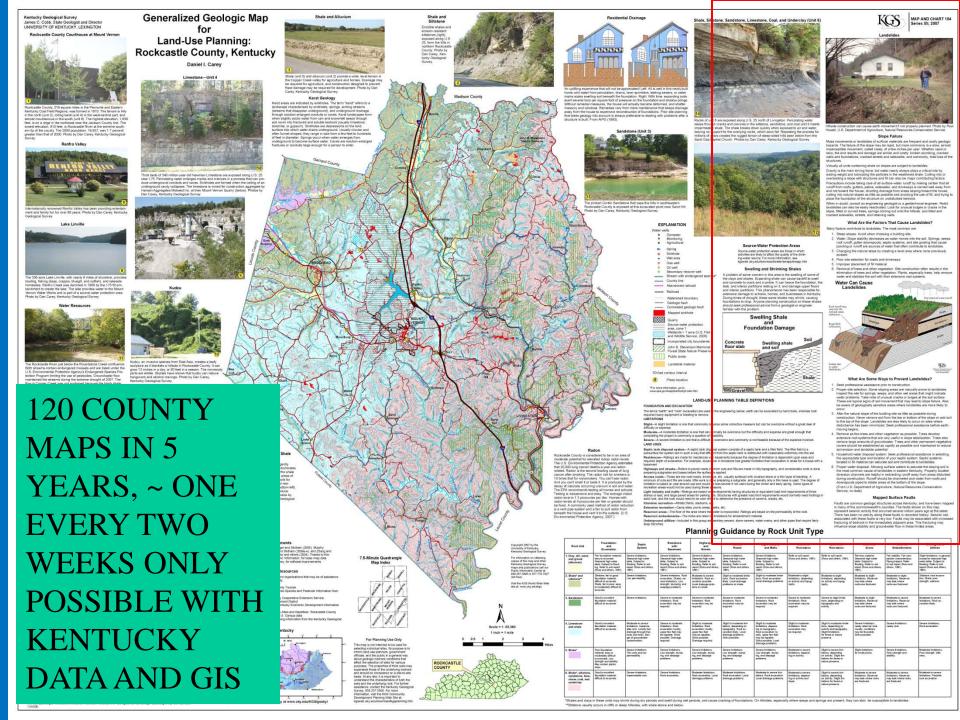


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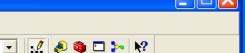
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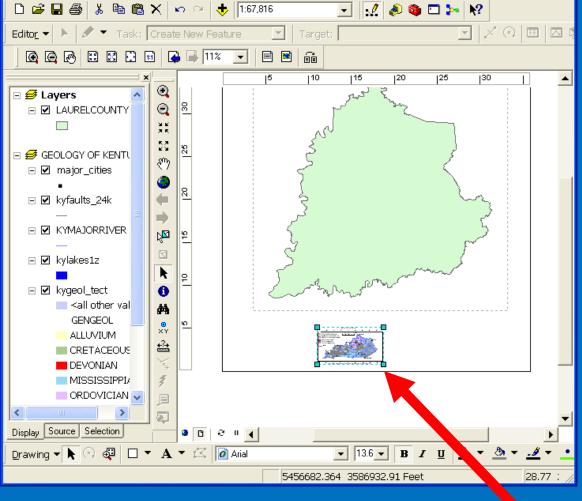




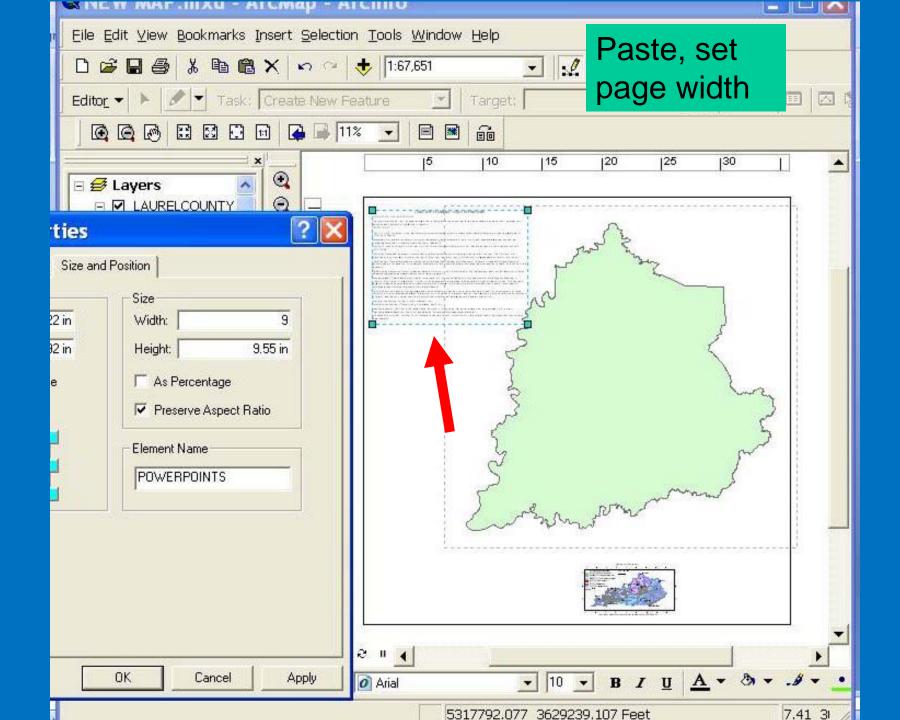
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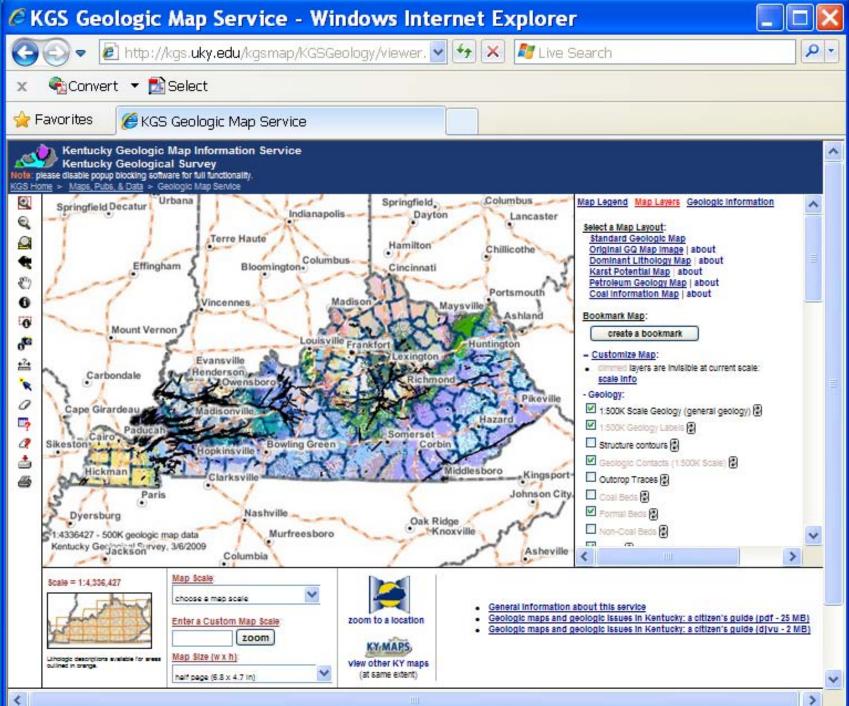
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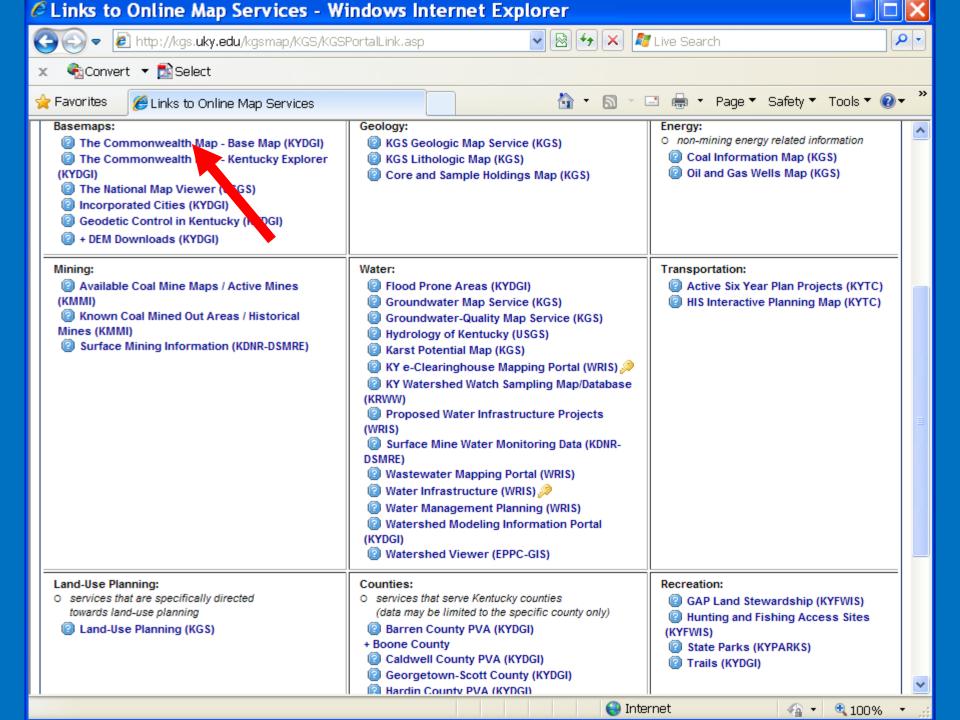


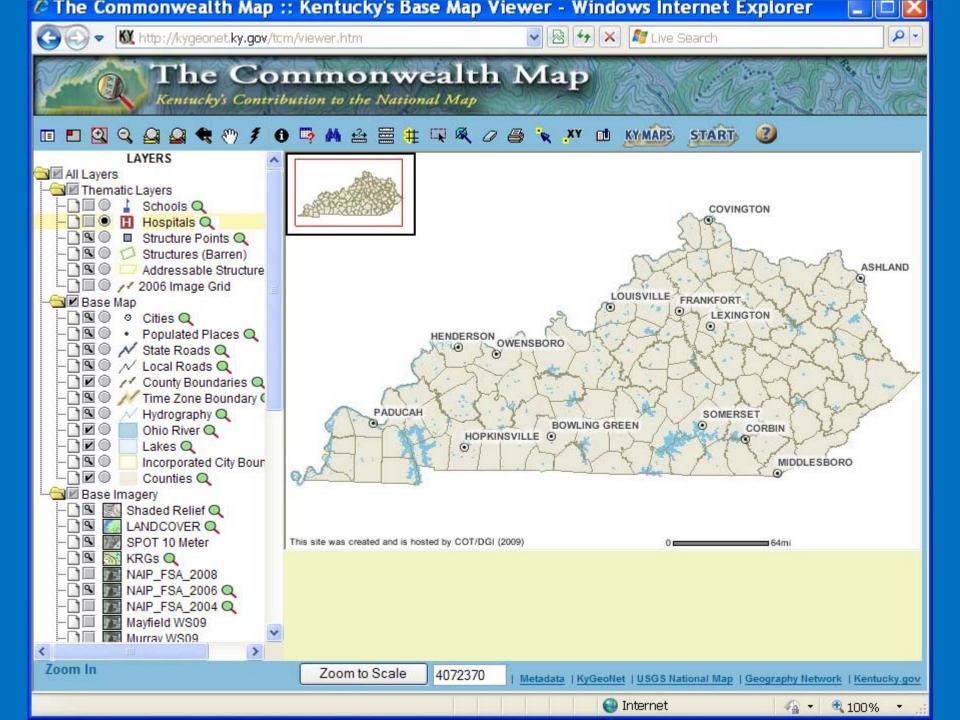
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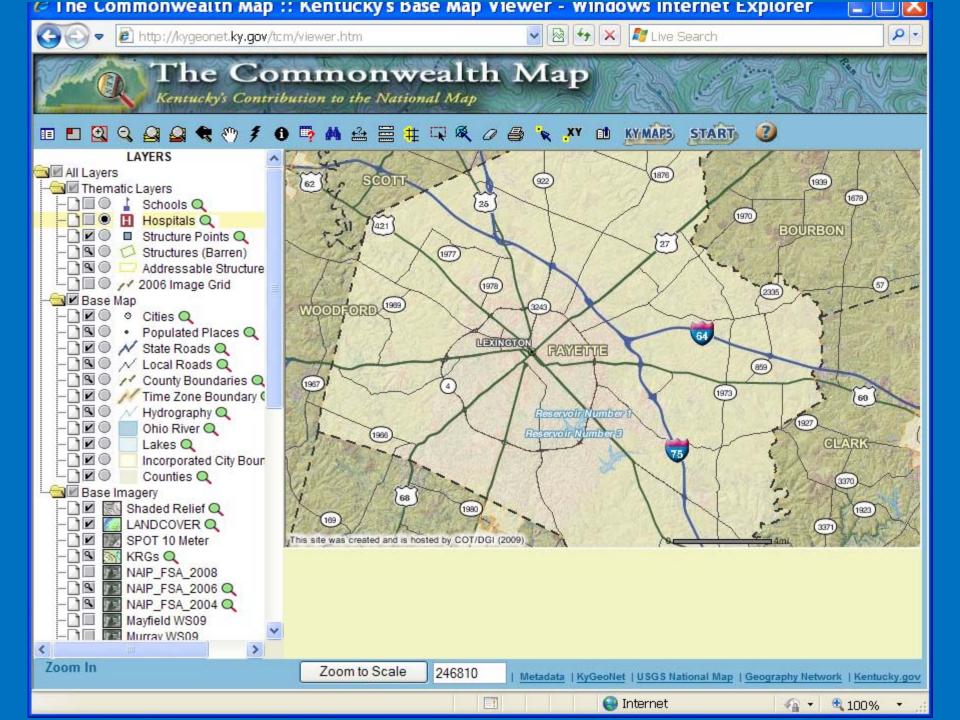


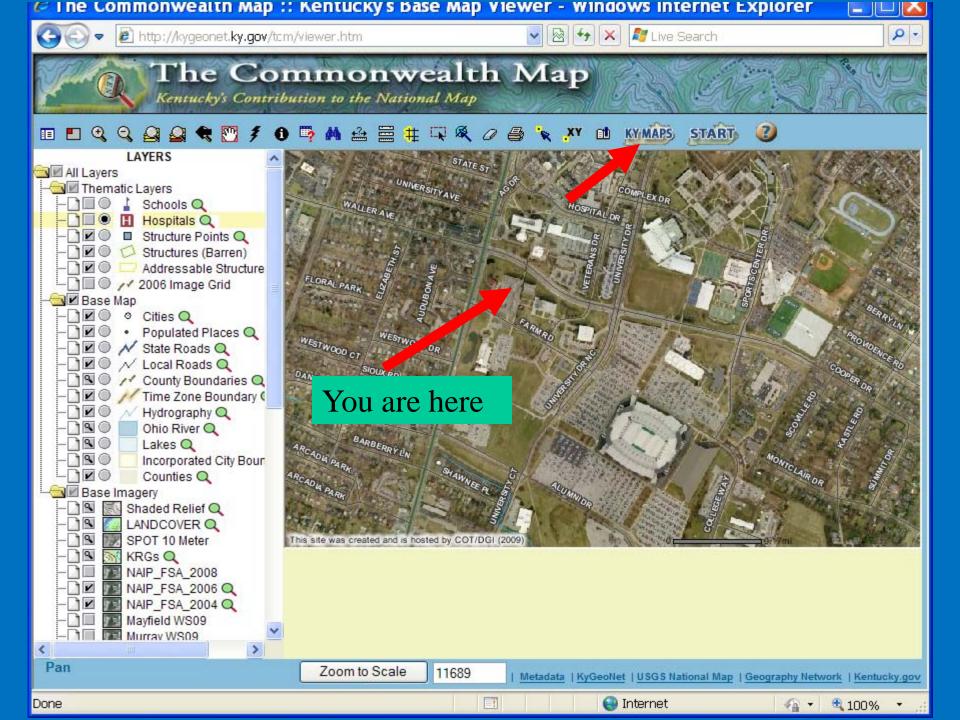
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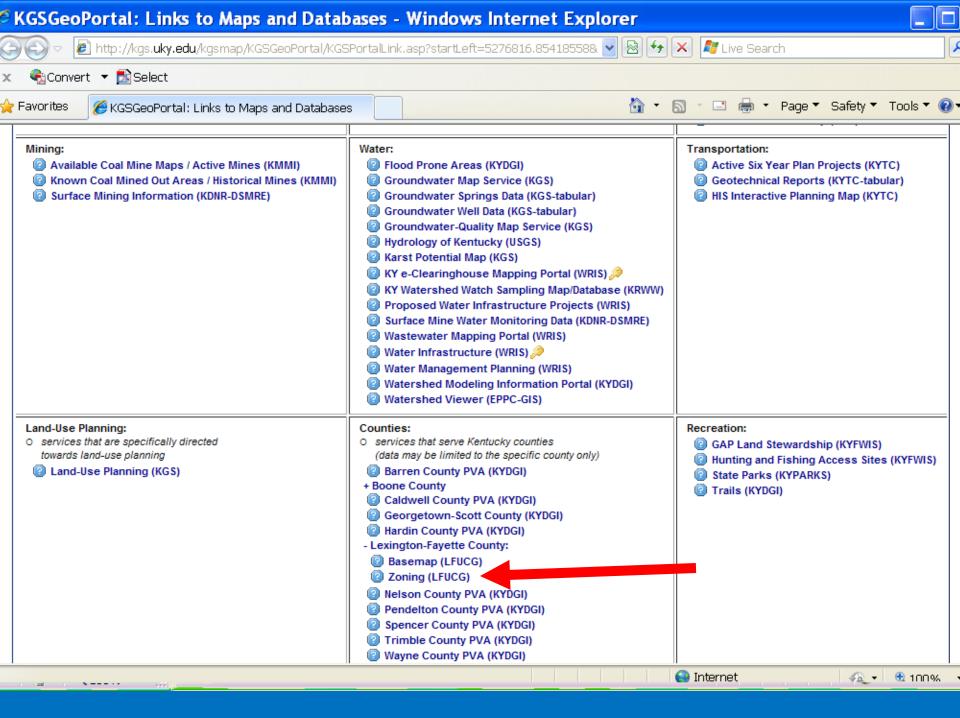
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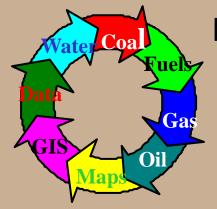
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