

### 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**

ising Gio	
👌 👉 🗙 💐 Live Search	<b>•</b>
🛉 🔹 🔝 👘 🝷 Page 🔻	Safety 🔻 Tools 🔻 🔞 👻 🎽
	<u>^</u>
KA LEATE LANDAR	5 <b>.</b>
a on oil and gas, water, coal, etc.	
<b>.</b>	
ock cores, geology, land-use and d	levelopment planning.
	iororophiene premining.
same area.	
	है 👉 🗙 ಶ Live Search

🚇 Internet

🐼 🔹 🔍 100% 🚬

C Ma	ips and (	GIS Research Kentucky Geologie	cal Survey site -	Windows Internet Explorer	_ 🗆 🞽
Ge	🔊 🔻 🙋 h	ttp://www. <b>uky.edu</b> /KGS/gis/gisresearch.htm		🖌 🗟 👉 🗙 🧗 Live Search	P-
x	Convert	🔹 🔂 Select			
🚖 Fav	vorites   👍	🖉 Free Hotmail 🖉 Web Slice Gallery 🔻 🏉 S	Suggested Sites 🔻		
🏉 Ma	aps and GIS I	Research Kentucky Geological		🏠 🔹 🗟 🔹 🚍 🖶 🕈 Page 🖜 Sa	afety 🔻 Tools 🕶 🕢 👻
	KGS	Kentucky Geological Survey			^
-		University Of Kentucky	Search KGS [ Contac	t KGS   KGS Home   UK Home	-
_	KG	S-Home:>GIS-and-Maps			
	G	IS and Mapping: Resear	ch at KGS		
		uāternary Mapping along the Oh	io Divor		
-				ternary deposits along and adjacent to the Ohio Rive into a small number of mapping units during the geol	
	1075	nanig nagamu Rénanse aftre himportanise due	Rins Linders Eve Righten of	exter finitial planting of summary discissing and the first areas is a priority: KGS personnel are working with so	ensite in ground
	led	al, state, and federal agencies to complete this	mapping and shale resu	Its. Mapping has thus far concentrated in Daviess, He	endersen <del>, a</del> nd Hancock 🔭
		untres <u>: manual is planned in Clinck-Micssor</u> Sen adi <u>angle-data</u> sets for-these-areas:-Contact- <u>Drev</u>		n Kénthr & Giff producter will include new digitatere mation:	clar gratagic.
- 1	K	arst Mapping in Kentucky			
			-Division of Water to Bho	duioenquadrangjeinnaperthat/shio///the-bidation-of/kane	Continent and the second
	of	the groundwater basins that they drain. Groundw	vater tracing experiments	s using fluorescent dyes must be conducted to under	stand the subsufface
	323	aniid tool for land use splanners, semeenstiwiid	iss <sub>m</sub> eand selessed operates in táthis	verkenstenensetti Kentusky – Derezaling magazanti alimestenesich states: DhereGNameps thetestewith:	
	8.080	lagese and flooding havands are planmed. Contact	t "linn, Cunnennes féar macares in	feannstiean	
=		and-Use Planning Maps			
-				odücts that communicate information about g <u>eolog</u> y/ _classrooms_homeowners_ and other non-geologists	
= 1	are	based on geology but are classified in termine	logynthatsrelatesstocland.	uze-Tables-provide-information-about-a-variety-of-dev	elopment issues and
~		grams and photographs illustrate the technical o ntact <u>Dan Carey</u> .	concepts: An interactive	internet:map.is:also:available for exploring these data	. For more information
<b>•</b> .:				😜 Internet	🕼 👻 🍭 100%

# 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**

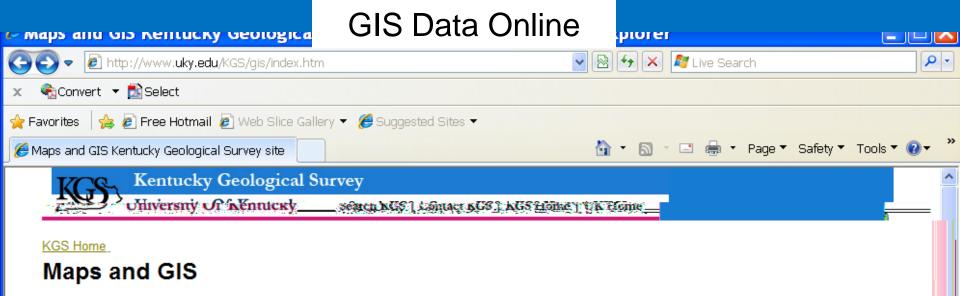
KGS is participating in three <u>Regional Carbon Sequestration projects</u> sponsored by the <u>U.S. Department of Energy</u> to provide information about long term storage opportunities for carbon dioxide emitted from electric power generating facilities. GIS data are collected at an <u>Internet mapping 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

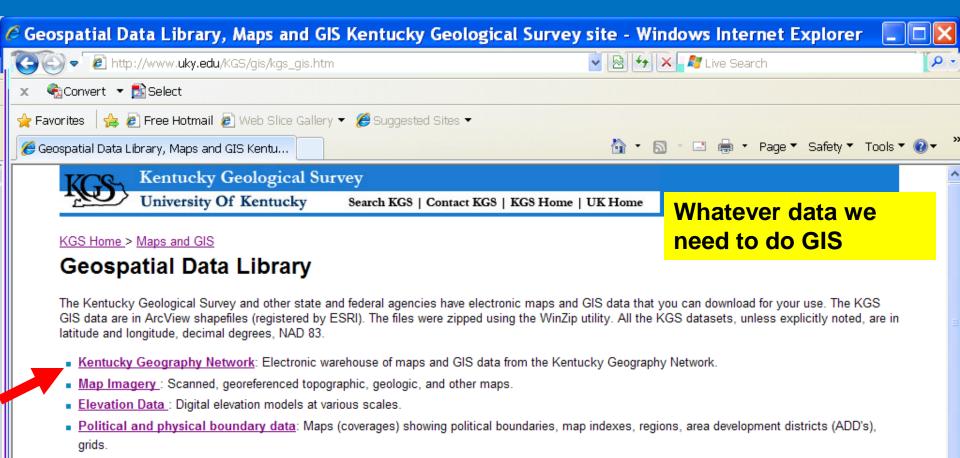
KGS personnel have been using GIS data to assist in developing maps of the Kentucky landscape. Visualizing the landscape in different ways is useful for different applications. A new physiographic map of Kentucky is being developed that delineates distinct areas of Kentucky 's topography, based on GIS 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.

100%

- B



- 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.

Contact Information: If you have any questions regarding the GIS information provided by the Kentucky Geological Survey, please contact <u>Dan Carey</u>, telephone (859) 257-5500, fax (859) 257-1147, Kentucky Geological Survey, 228 Mining and Mineral Resources Building, University of Kentucky, Lexington, KY 40506-0107

- A





🖉 Geospatial Data Library, Maps and GIS Kentucky Geologic	al Survey site - Windows Internet Explorer	
COO 🗸 🖉 http://www. <b>uky.edu</b> /KGS/gis/kgs_gis.htm	🖌 🔯 🍫 🗙 📲 Live Search	. م
🗙 🍓 Convert 🔻 🔂 Select		
🚖 Favorites 🛛 🚖 🔊 Free Hotmail 🔊 Web Slice Gallery 🔻 🏈 Suggested Sites 👻		
Ceospatial Data Library, Maps and GIS Kentu	🏠 🔹 🗟 🔹 🖶 👻 Page 🖜 Safety 🔻 T	ools 🔻 🕡 👻
Kentucky Geological Survey		^
University Of Kentucky Search KG8   Contact KG8	KGS Home   UK Home	

#### KGS Home > Maps and GIS

#### Geospatial Data Library

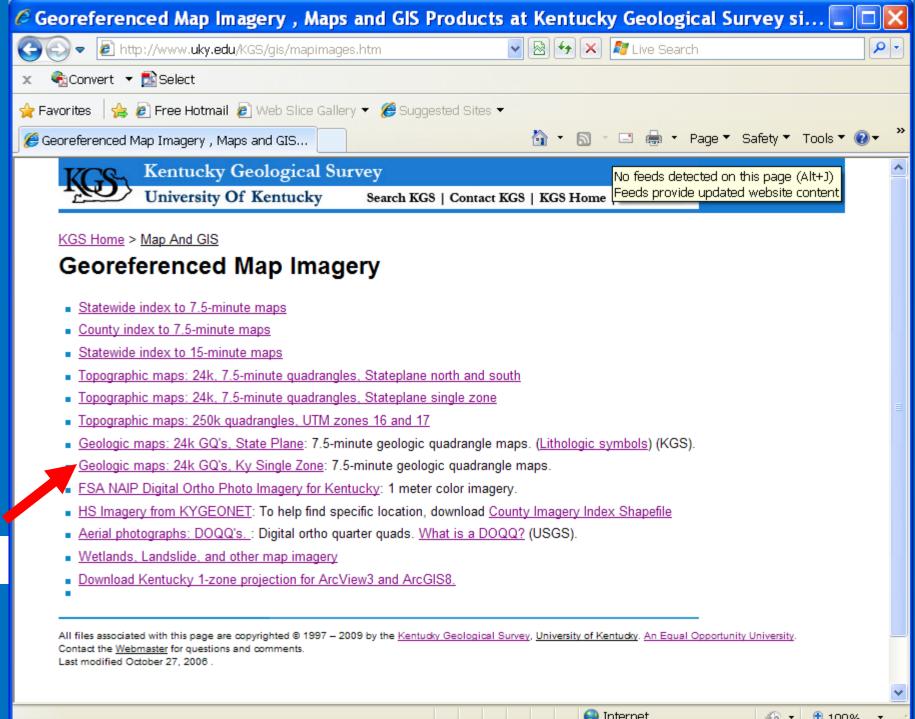
The Kentucky Geological Survey and other state and federal agencies have electronic maps and GIS data that you can download for your use. The KGS GIS data are in ArcView shapefiles (registered by ESRI). The files were zipped using the WinZip utility. All the KGS datasets, unless explicitly noted, are in latitude and longitude, decimal degrees, NAD 83.

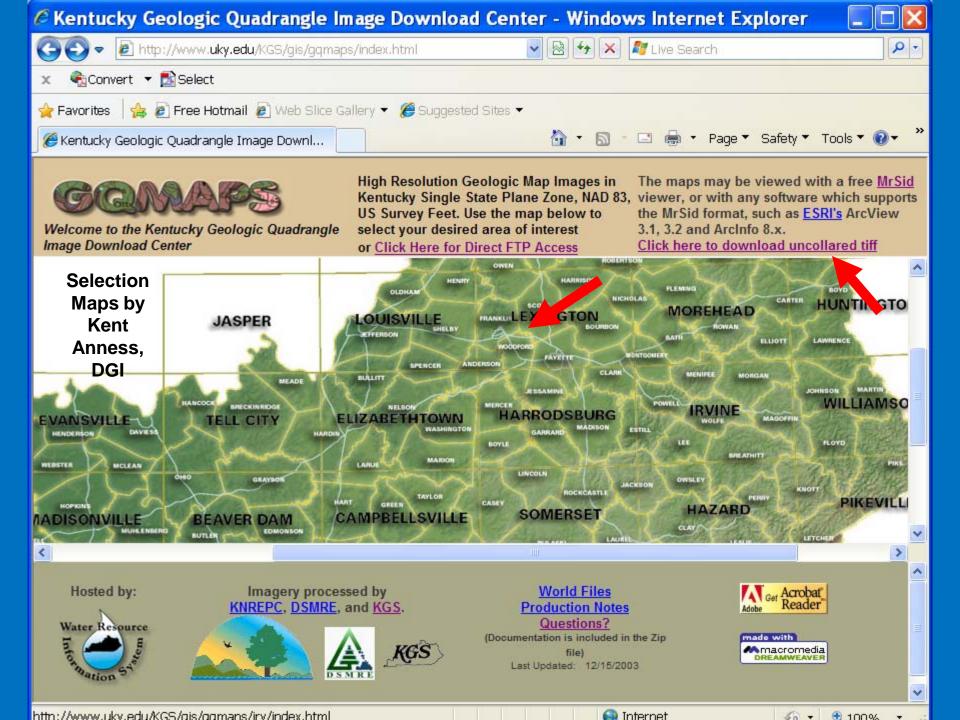
- Kentucky Geography Network: Electronic warehouse of maps and GIS data from the Kentucky Geography Network.
- Map Imagery : Scanned, georeferenced topographic, geologic, and other maps.
- <u>Elevation Data</u>: Digital elevation models at various scales.
- Political and physical boundary data: Maps (coverages) showing political boundaries, map indexes, regions, area development districts (ADD's), grids.
- . 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.

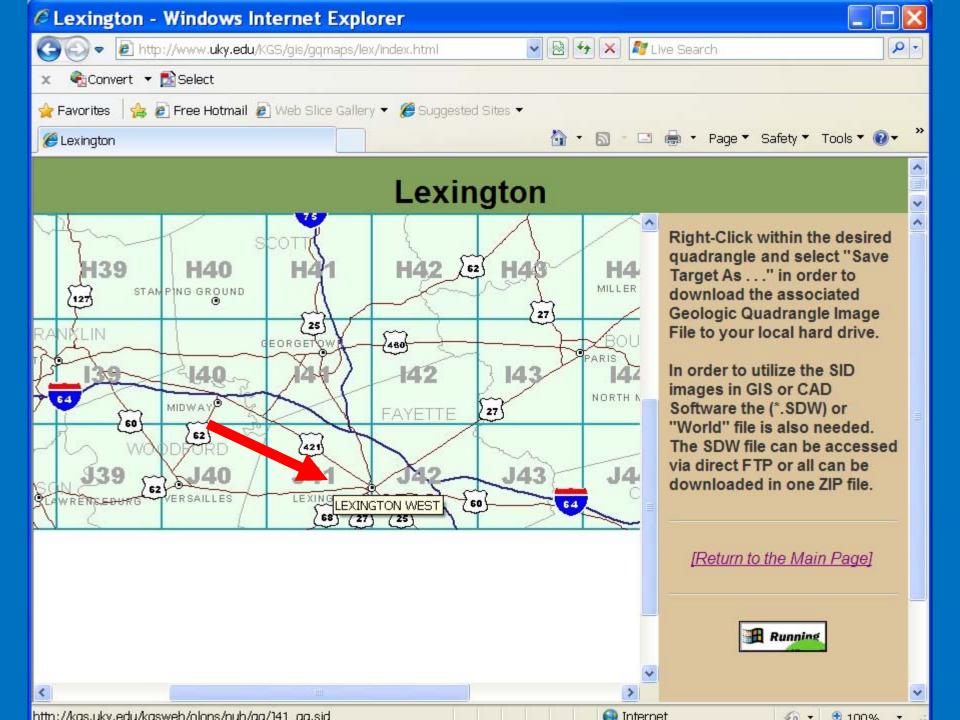
Contact Information: If you have any questions regarding the GIS information provided by the Kentucky Geological Survey, please contact <u>Dan Carey</u>, telephone (859) 257-5500, fax (859) 257-1147, Kentucky Geological Survey, 228 Mining and Mineral Resources Building, University of Kentucky, Lexington, KY 40506-0107

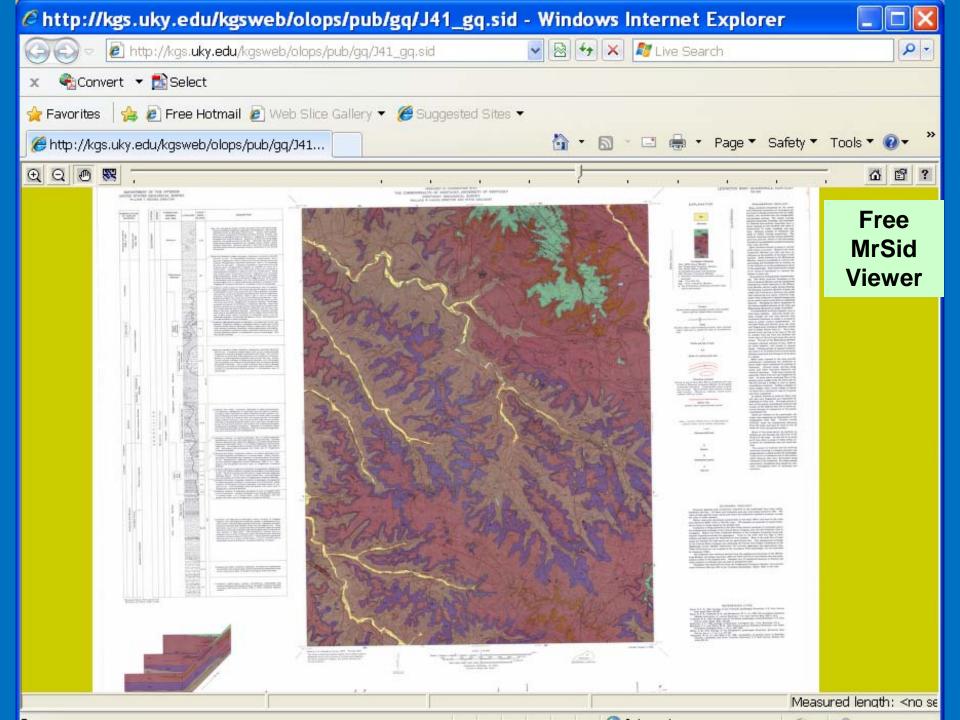
😜 Internet

🐴 🔹 🔍 100% .









Z KENGUCKY WEGIANUS IMAYE DOWINIOAU CENCEL - MICLOSORT INCENER EXPLORED	
File Edit View Favorites Tools Help	19. 19.
🖙 Back 🔹 🤿 🕫 🖓 🖓 Search 📾 Favorites 🧭 🖏 🖉 🚽 🕼 🔹	
Address 💩 http://www.uky.edu/KGS/gis/wetlands/index.html	💌 🔗 Go 🛛 Links 🎽 💎

#### Wetlands (NWIP Home)

Welcome to the Kentucky Wetlands Image Download Center National Wetlands Inventory Map Images in Kentucky Single State Plane Zone, NAD 83, US Survey Feet. Use the map below to select your desired area of interest or <u>Click Here for Direct FTP Access</u>

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.

# TOPOGRAPHY GEOLOGY WETLANDS LANDSLIDES AERIALS DEMS





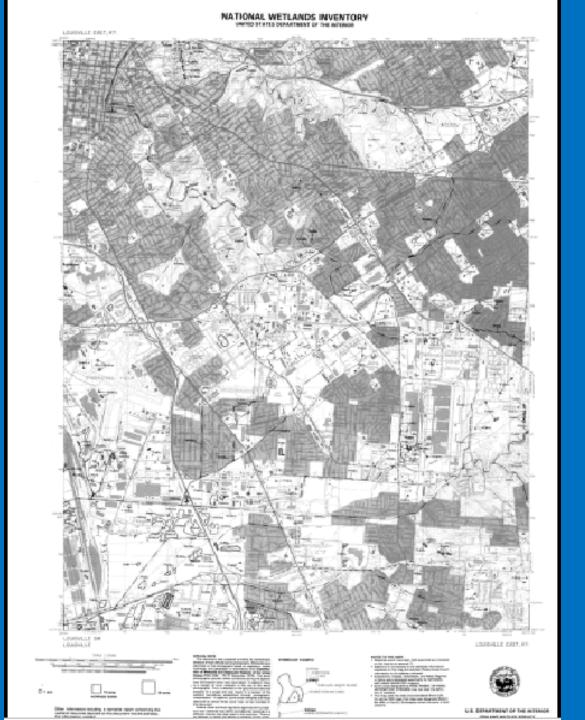


World Files Key to Wetlands Symbols About Wetlands Production Notes Questions? (Documentation is included in the Zip file) Last Updated: 12/15/2003



M macromedia DREAMWEAVER

# GEOREFERENCED MAPS, MRSID FORMAT





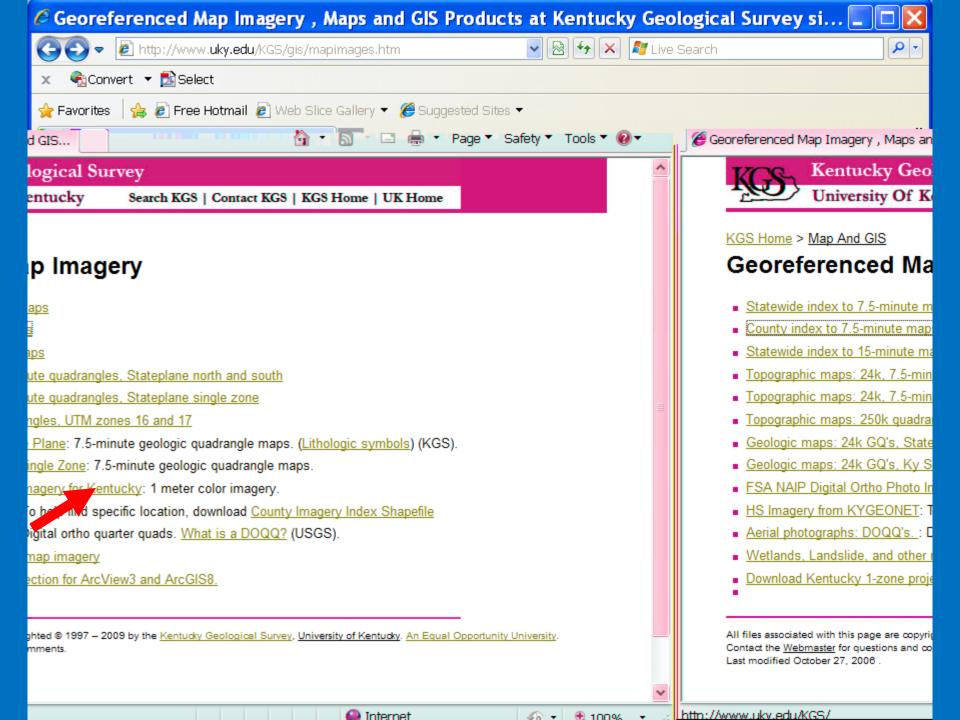
#### FTP directory /gqs/ at ftp.kymartian.ky.gov

To view this FTP site in Windows Explorer, click Page, and then click Open FTP Site in Windows Explorer.

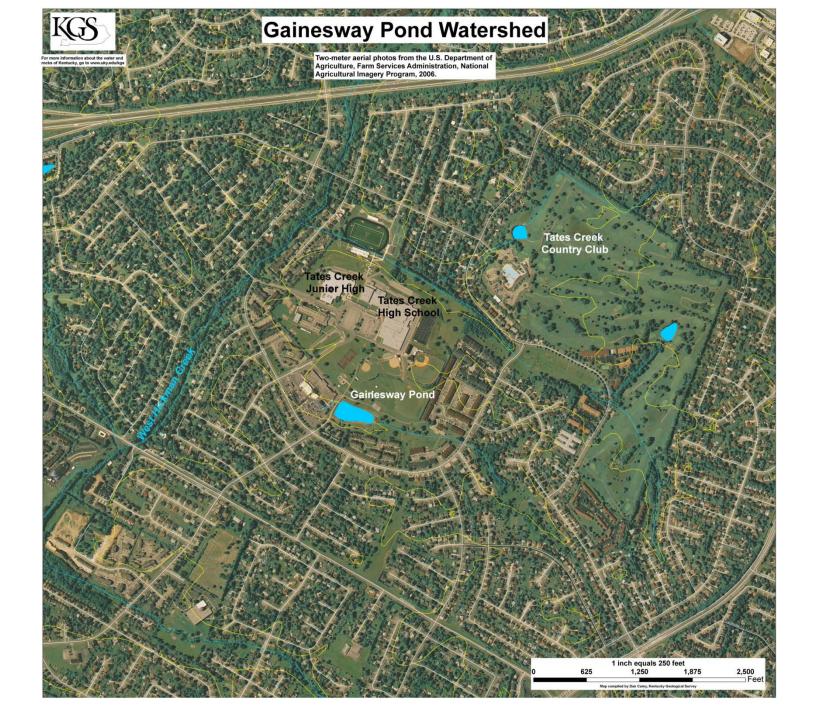
#### Up to higher level directory

02/10/2005	12:00AM	7,848,426	gq_a39c.sid
02/10/2005	12:00AM		gq_a40c.sdw
02/10/2005	12:00AM		gq a40c.sid
02/10/2005	12:00AM		gq b38c.sid
02/10/2005	12:00AM		gq b39c.sid
02/10/2005	12:00AM		gq b40c.sdw
02/10/2005	12:00AM		gq b40c.sid
02/10/2005	12:00AM		gq b41c.sdw
02/10/2005	12:00AM		gq b41c.sid
02/10/2005	12:00AM		gq b42c.sid
02/10/2005	12:00AM		gq b43c.sid
02/10/2005	12:00AM		gq c38c.sdw
02/10/2005	12:00AM		gq c38c.sid
02/10/2005	12:00AM		gq c39c.sdw
02/10/2005	12:00AM		gq c39c.sid
02/10/2005	12:00AM		gq c40c.sdw
02/10/2005	12:00AM		gq c40c.sid
02/10/2005	12:00AM		gq c41c.sdw
02/10/2005	12:00AM		gq c41c.sid
02/10/2005	12:00AM		gq c42c.sdw
02/10/2005	12:00AM		gq c42c.sid
02/10/2005	12:00AM		gq c43c.sdw
02/10/2005	12:00AM		gq c43c.sid
02/10/2005	12:00AM		gq c44c.sdw
02/10/2005	12:00AM		gq c44c.sid
02/10/2005	12:00AM		aa d37c.sdw

# FTP DOWNLOAD SITES







#### 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

C Links to More Map and GIS Information, Maps and GIS Ken	ntucky Geological Survey site - Window	• 💶 🗖
Goo ▼ Image: A the state of	🖌 🗟 👉 🗙 🧗 Live Search	P -
x Convert - Select		
Web Slice Gallery 🔻 🎉 Suggested Sites 👻	😭 Favorites 🛛 🚖 🔊	Free Hotmail 🥖
on, Map 🙆 🔹 📾 👻 📼 🖶 🔹	Page ▼ Safety ▼ Tools ▼	and GIS Informat
eological Survey	^ KCS	Kentucky G
KentuckySearch KCS_LContact KCS_LKCS HomeUK, Home		University, Of
	KGS Home >	Maps and GIS
ap and GIS Information	Links to	o More N
<u>k</u>		Geography Netwo
c maps, interactive maps, standards Digitial Mapping Program		adable data, stati Geological Survey
Digitial Mapping Program o convert Kentucky's 1:24,000 GQ series to GIS format		ibes the program
o content nemberly o 1.27,000 org bened to oro format		Highway Maps
ntucky Transportation Cabinet		maps from the Ke
	<ul> <li>Other Map</li> </ul>	
d scanned, georeferenced maps		view, and downloa
System (WRIS)	<ul> <li>Water Res</li> </ul>	source Information
icture in Kentuckydata, maps, reports	Water	and sewer infrastr
	<ul> <li>Terra Serve</li> </ul>	
al photos		te imagery and aei
ic Information (OGI)		Office of Geograph
у		tivities in Kentucl
<u>GS)</u>		eodetic Survey (N
benchmarks and other geodetic information.		the NGS site for
on System (GNIS)		c Names Informat
site where you can search for the location of more than 2 million physical and cultural geog		Geological Surve
	v name of th	ne feature.
😜 Internet	√	

🖉 Geospatial Data Library, Maps and GIS Kentucky Geo	ological Survey site - Windows Internet Explorer 🛛 📃	
💽 💽 🔻 🙋 http://www. <b>uky.edu</b> /KGS/gis/kgs_gis.htm	🖌 🔯 😽 🗙 📲 Live Search	. م
🗙 🍕 Convert 🔻 🛃 Select		
🚖 Favorites 🛛 🚖 🔊 Free Hotmail 🕖 Web Slice Gallery 🔻 🏉 Suggested Sites	s <b>-</b>	
🔏 Geospatial Data Library, Maps and GIS Kentu	🟠 👻 🗟 🝸 🚍 🖷 👻 Page 🔻 Safety 🔻 Tools 🔻	• • • • • • • • • • • • • • • • • • •
KCS Kentucky Geological Survey		^
University Of Kentucky Search KGS   Conta	act KGS   KGS Home   UK Home	

#### KGS Home > Maps and GIS

#### Geospatial Data Library

The Kentucky Geological Survey and other state and federal agencies have electronic maps and GIS data that you can download for your use. The KGS GIS data are in ArcView shapefiles (registered by ESRI). The files were zipped using the WinZip utility. All the KGS datasets, unless explicitly noted, are in latitude and longitude, decimal degrees, NAD 83.

- Kentucky Geography Network: Electronic warehouse of maps and GIS data from the Kentucky Geography Network.
- <u>Map Imagery</u>: Scanned, georeferenced topographic, geologic, and other maps.
- <u>Elevation Data</u>: Digital elevation models at various scales.
- Political and physical boundary data: Maps (coverages) showing political boundaries, map indexes, regions, area development districts (ADD's), grids.
- . 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.

Contact Information: If you have any questions regarding the GIS information provided by the Kentucky Geological Survey, please contact <u>Dan Carey</u>, telephone (859) 257-5500, fax (859) 257-1147, Kentucky Geological Survey, 228 Mining and Mineral Resources Building, University of Kentucky, Lexington, KY 40506-0107

😜 Internet

🐴 🔹 🔍 100%.



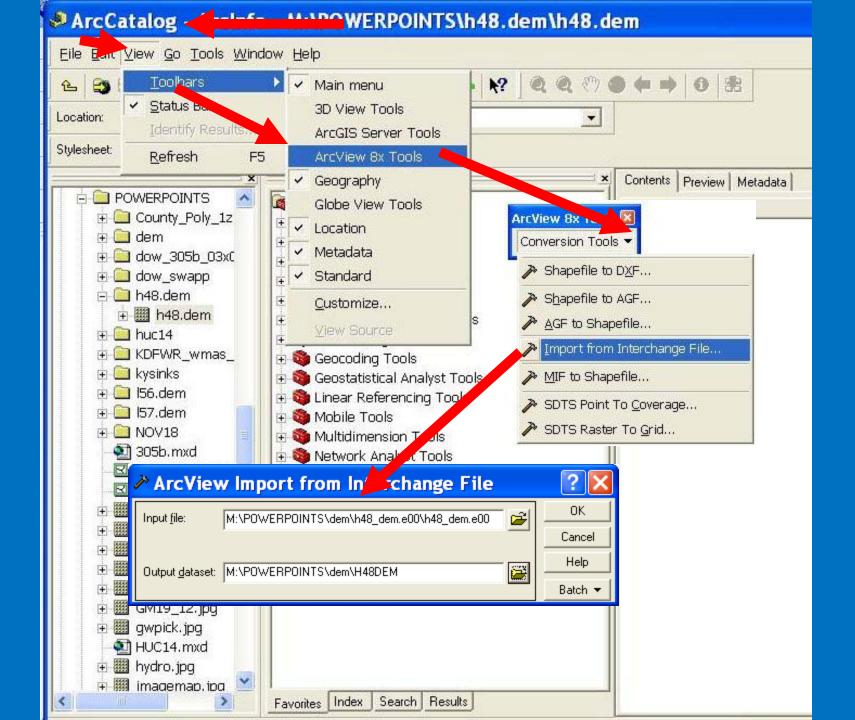








C FIP dire	ctory /dem:	s/ at ftp.kymartian.ky.g	ov	- Windows Internet Explorer		
<del>()</del> () = (e)	) ftp://ftp.kymarti	an. <b>ky.gov</b> /dems/		🖌 🐼 🏍 🔀 😼		_
🗴 🔩Convert	: 🔻 🛃 Select					
🚖 Favorites	🏉 FTP directory	/dems/ at ftp.kymartian.ky.gov		🐴 🔹 🗟 🝸 🖶 🝷 Page 🔻 Sa	fety ▼ T(	00
10/04/2002 10/04/2002	12:00AM 12:00AM	4,307,649 <u>133</u> dem.e00.zip 4,096,253 <u>134</u> dem.e00.zip 4,224,535 <u>135</u> dem.e00.zip 4,309,744 <u>137</u> dem.e00.zip 4,20,096 <u>138</u> dem.e00.zip 4,220,096 <u>138</u> dem.e00.zip 4,220,096 <u>138</u> dem.e00.zip 4,282,424 <u>140</u> dem.e00.zip 4,288,983 <u>141</u> dem.e00.zip 4,288,983 <u>141</u> dem.e00.zip 4,296,974 <u>143</u> dem.e00.zip 4,296,974 <u>143</u> dem.e00.zip 4,244,626 <u>144</u> dem.e00.zip 4,567,690 <u>147</u> dem.e00.zip 4,567,690 <u>147</u> dem.e00.zip 4,567,690 <u>147</u> dem.e00.zip 4,567,690 <u>149</u> dem.e00.zip 4,561,761 <u>150</u> dem.e00.zip 4,561,761 <u>150</u> dem.e00.zip 4,561,761 <u>150</u> dem.e00.zip 4,714,245 <u>152</u> dem.e00.zip 4,816,464 <u>155</u> dem.e00.zip 4,816,464 <u>155</u> dem.e00.zip 4,951,067 <u>156</u> dem.e00.zip 5,016,027 <u>158</u> dem.e00.zip 5,016,027 <u>158</u> dem.e00.zip 3,096,139 m12 dem.e00.zip 3,660,682 m14 dem.e00.zip 3,374,682 m15 dem.e00.zip 3,679,096 m16 dem.e00.zip 3,629,905 m18 dem.e00.zip 3,682,923 m19 dem.e00.zip		<section-header><text></text></section-header>		
				😜 Internet		21

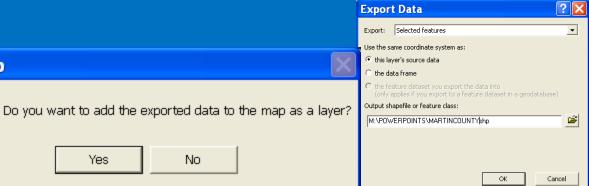


7.5' 10-meter dems download, unzip, import, add to ArcMap, combine



# Select feature(s), right-click on layer, Data, Export Data





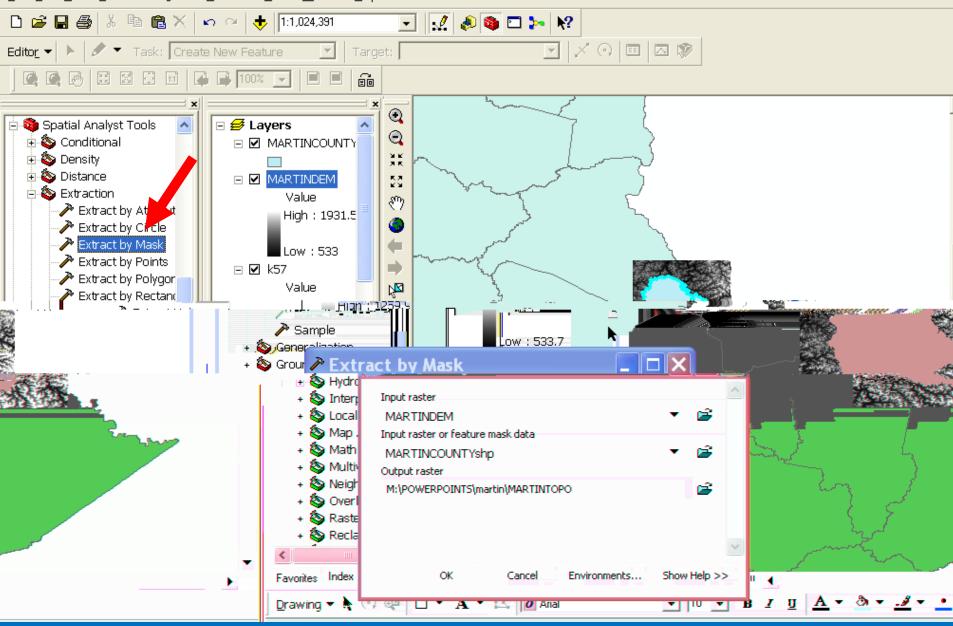
#### ArcMap

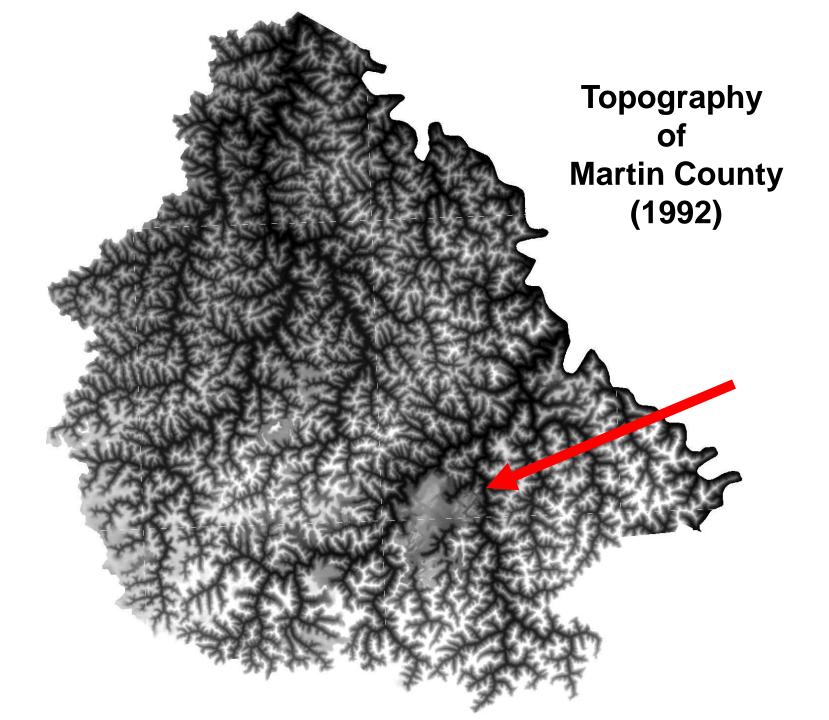


#### MARTINTOPO.mxd - ArcMap - ArcInfo



<u>File Edit View Bookmarks Insert Selection Tools Window H</u>elp





🖉 Geospatial Data Library, Maps and GIS Kentucky Geologica	al Survey site - Windows Internet Explorer	
🚱 🗢 🙋 http://www. <b>uky.edu</b> /KGS/gis/kgs_gis.htm	🖌 🗟 🗲 🗙 🧖 Live Search	. م
🗙 🍓 Convert 🔻 🔂 Select		
🚖 Favorites 🛛 🚖 🔊 Free Hotmail 🔊 Web Slice Gallery 🔻 🏈 Suggested Sites 👻		
🖉 Geospatial Data Library, Maps and GIS Kentu	🏠 🔹 🔝 🔹 🖶 👻 Page 👻 Safety 👻 T	ools 🔻 🔞 🗸 👋
Kentucky Geological Survey		^
University Of Kentucky Search KGS   Contact KGS	KGS Home   UK Home	
		_

#### KGS Home > Maps and GIS

#### Geospatial Data Library

The Kentucky Geological Survey and other state and federal agencies have electronic maps and GIS data that you can download for your use. The KGS GIS data are in ArcView shapefiles (registered by ESRI). The files were zipped using the WinZip utility. All the KGS datasets, unless explicitly noted, are in latitude and longitude, decimal degrees, NAD 83.

- Kentucky Geography Network: Electronic warehouse of maps and GIS data from the Kentucky Geography Network.
- Map Imagery : Scanned, georeferenced topographic, geologic, and other maps.
- <u>Elevation Data</u>: Digital elevation models at various scales.
- Political and physical boundary data: Maps (coverages) showing political boundaries, map indexes, regions, area development districts (ADD's), grids.
- 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.

Contact Information: If you have any questions regarding the GIS information provided by the Kentucky Geological Survey, please contact <u>Dan Carey</u>, telephone (859) 257-5500, fax (859) 257-1147, Kentucky Geological Survey, 228 Mining and Mineral Resources Building, University of Kentucky, Lexington, KY 40506-0107

😜 Internet

🐴 🔹 🔍 100% .

- <b>-</b> - 646	e boulinai y series, m	ара ана ою пентаску о	eviv5icai J	игтеуэне - тппиотта п	inerner Exhinier 🛛 🖻	ور الم
00	🗢 🙋 http://www. <b>uky.edu</b> /KGS	6/gis/bounds.htm		👻 😣 🗲 🗶 🌌 Liv	ve Search	<b>P</b> -
x 🍖	Convert 🔻 🔂 Select					
🚖 Favor	ites   👍 🙋 Free Hotmail 💋 V	Web Slice Gallery 👻 🏉 Suggested S	Sites 🔻			
🏉 State	Boundary Series, Maps and GIS	Kentuc		👌 🔹 🗟 🕤 🖃	🖶 🔹 Page 🔻 Safety 👻 Tools 🤊	• 🕢 • »
	KCS Kentucky Ge	ological Survey				^
	Luniversity Or.	Kennucky Search & Search	iantaziFKQu'yZKi	Wirmure' / USS kannes		
	KGS Home > Maps and GIS					
	State Boundary Series			l	1	
	Coverages showing political boundaries	s, map indexes, regions, area development (	districts (ADDs), g	Congressional Districts of Kentucky	kycongress.zip (0.5 Mb)	
	Description	Click to Download by FTP (file size)		Kentucky State House Districts	kyhouse.zip (2.0 Mb)	
	Area Development District boundaries	ADDS.ZIP (0.06 Mb)		Kentucky Senate Districts	kysenate.zip (1.3 Mb)	
	Census blocks, 1990	CENTRACT.ZIP (7 Mb)		Regions of Kentucky	REGIONS.ZIP (0.06 Mb)	
	Census tracts, 2000	kytracts2000.zip (1.7 Mb)		Kentucky Zip Codes	ZIPKY.ZIP (0.72 Mb)	_
	Census blocks, 2000	Census Blocks 2000 by County		7.5-minute guadrangle index grid	QUADSKY.ZIP (0.04 Mb)	
	Census block groups, 2000	kyblkgrp2000.zip (7.3 Mb)		15-minute quadrangle grid	QUADS15.ZIP (0.01 Mb)	
	County boundaries	From KY/GEONET (scroll down)		100,000-scale USGS map grid index	MAPS100K.ZIP (0.003 Mb)	-
	ucky Cities and Populated Places	From KYGEONET (scroll down)		250,000-scale index grid	MAPS250K.ZIP (0.004 Mb)	
	Kentucky state boundary	<u>KY.ZIP</u> (0.09 Mb)			MARS22011.21P (0.004 MD)	<b>~</b>

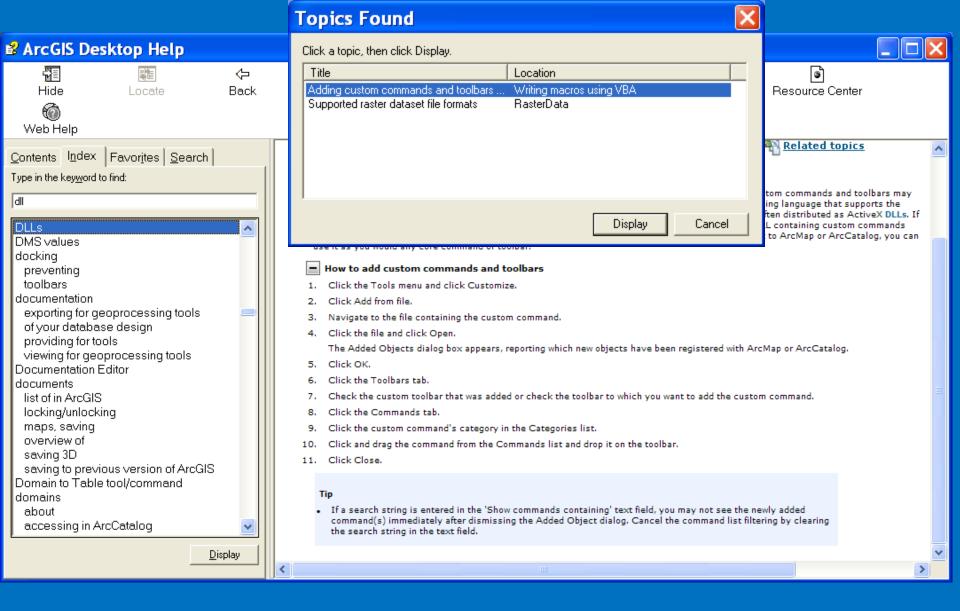
읳 Internet

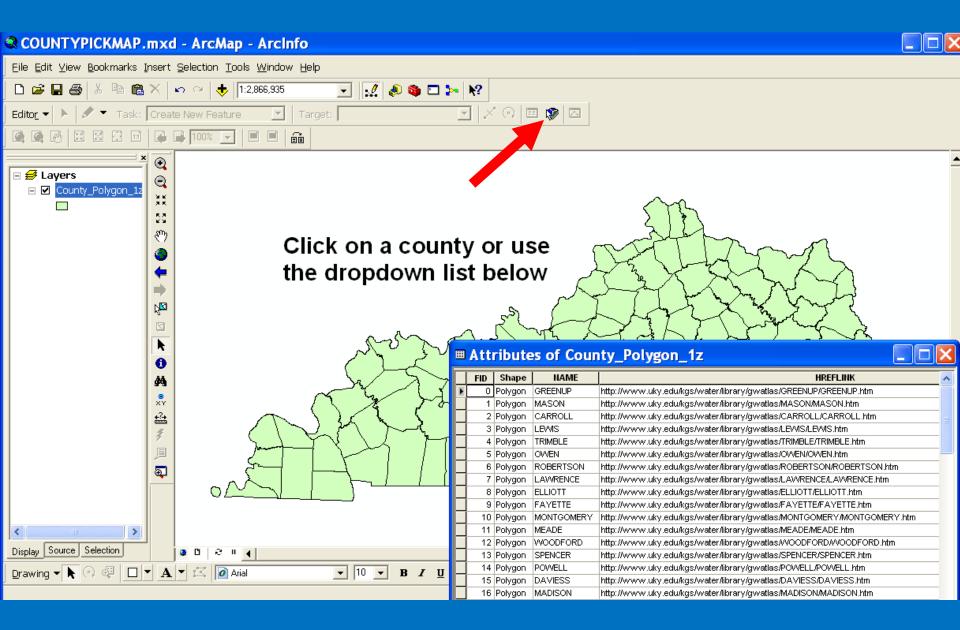
🖓 🔹 🔍 100% 🔹 🛒



## www.ESRI.com/Support/Downloads/ArcScripts

ArcScripts Home - ESRI Support - Windows I	nternet Explorer		
😋 🔄 🔻 🙋 http://arcscripts. <b>esri.com</b> /	<ul> <li>E</li> <li>E</li></ul>	🔀 🖉 esri	<b>P</b> -
x 🗣 Convert 🔻 🔂 Select			_
🖕 Favorites 🛛 👍 🔊 Free Hotmail 🖉 Web Slice Gallery 🔻 🏈 Sugg	ostad Citas 💌		
			• »
ArcScripts Home - ESRI Support	â • (	🗟 🕤 🖃 🖶 🔻 Page 🔻 Safety 👻 Tools 👻 (	•
You are here: <u>Home</u> > <u>Downloads</u> > ArcScripts	HTML Image Map Creator		^
Search ArcScripts			
	download contact author   download help   ]	add bookmark I view bookmarks	
Use the following options to customize your search:		Them and the second	1
All languages 🗸	Author	<u>kevin robicheau</u>	1
	File Name	ImageMapper.zip	
All ESRI software	Language	Visual Basic	
10 💌 Results per page 🗆 Show script summare	Last Modified	Jun 10 2005	
Kesuics per page 🖾 Show script summare	Status of work	Public Domain	
Search for IMAGEMAP Search Tips	Software	ArcGIS Desktop	
	File Size	135.32 kb	
Ouick Searches	Downloads	2205	=
<ul> <li><u>Top ten ArcScripts</u> The ten most popular ArcScripts.</li> <li><u>Latest ArcScripts</u> The most recent ArcScripts.</li> <li><u>View all ArcScripts</u> A complete list of all ArcScripts.</li> </ul>	the moderator if this script is a demo, trial-ve	s is intended for the free exchange of scripts and too rsion, or an advertisement for a retail product. map (a clickable map) from a polygon layer. It work: ap polygon from. e of contents.	-
My ArcScripts	HREF is the link, for example -	dded to the table of the feature class.	
<ul> <li><u>Upload a script</u> (login required)</li> <li>Do you want to share a script with the ESRI user community?</li> <li>Upload it here!</li> <li>Edit mutation (logic required)</li> </ul>	http://www.boston.com NAME is the text that shows up when the poin Output is a jpeg and a html page. this is a dll -you can add it to ArcGIS though	nter hovers over a polygon. the customize window- and the code to compile it.	~





🖉 Geospatial Data Library, Maps and GIS Kentucky Geological Su	urvey site - Windows Internet Explorer	
💽 🗢 🖉 http://www. <b>uky.edu</b> /KGS/gis/kgs_gis.htm	🖌 🗟 🗲 🔀 Live Search	. م
🗙 🔩 Convert 🔻 🛃 Select		
🚖 Favorites 🛛 🚖 🙋 Free Hotmail 🙋 Web Slice Gallery 🔻 🏈 Suggested Sites 👻		
🥖 Geospatial Data Library, Maps and GIS Kentu	🏠 🔹 🔝 🔹 🖶 🝷 Page 👻 Safety 💌	Tools 🔻 🔞 👻
KCS Kentucky Geological Survey		^
University Of Kentucky Search KG8   Contact KG8   KG8	Home   UK Home	

#### KGS Home > Maps and GIS

#### Geospatial Data Library

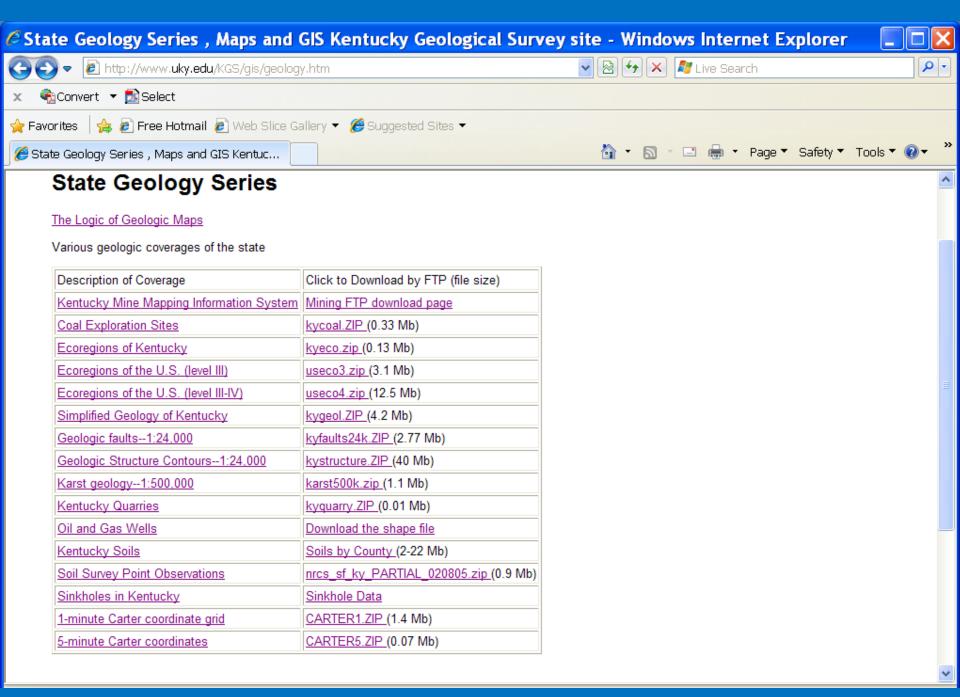
The Kentucky Geological Survey and other state and federal agencies have electronic maps and GIS data that you can download for your use. The KGS GIS data are in ArcView shapefiles (registered by ESRI). The files were zipped using the WinZip utility. All the KGS datasets, unless explicitly noted, are in latitude and longitude, decimal degrees, NAD 83.

- Kentucky Geography Network: Electronic warehouse of maps and GIS data from the Kentucky Geography Network.
- Map Imagery : Scanned, georeferenced topographic, geologic, and other maps.
- <u>Elevation Data</u>: Digital elevation models at various scales.
- Political and physical boundary data: Maps (coverages) showing political boundaries, map indexes, regions, area development districts (ADD's), grids.
- 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.

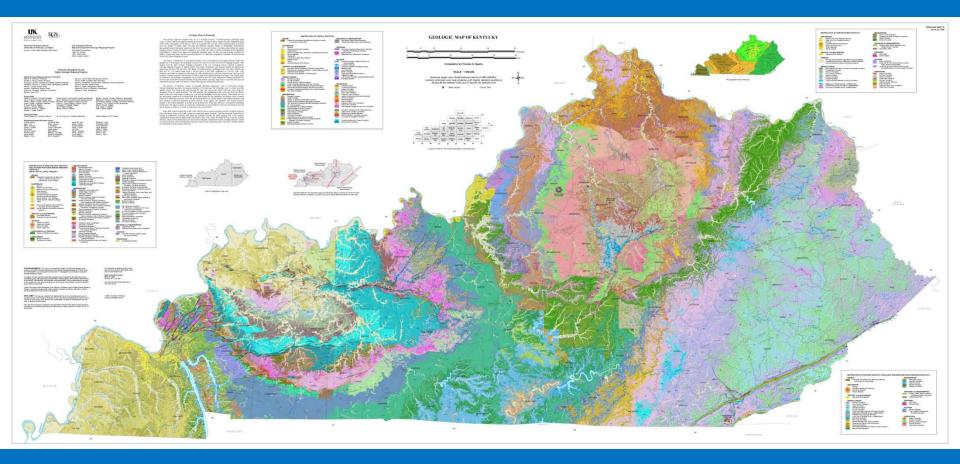
Contact Information: If you have any questions regarding the GIS information provided by the Kentucky Geological Survey, please contact <u>Dan Carey</u>, telephone (859) 257-5500, fax (859) 257-1147, Kentucky Geological Survey, 228 Mining and Mineral Resources Building, University of Kentucky, Lexington, KY 40506-0107

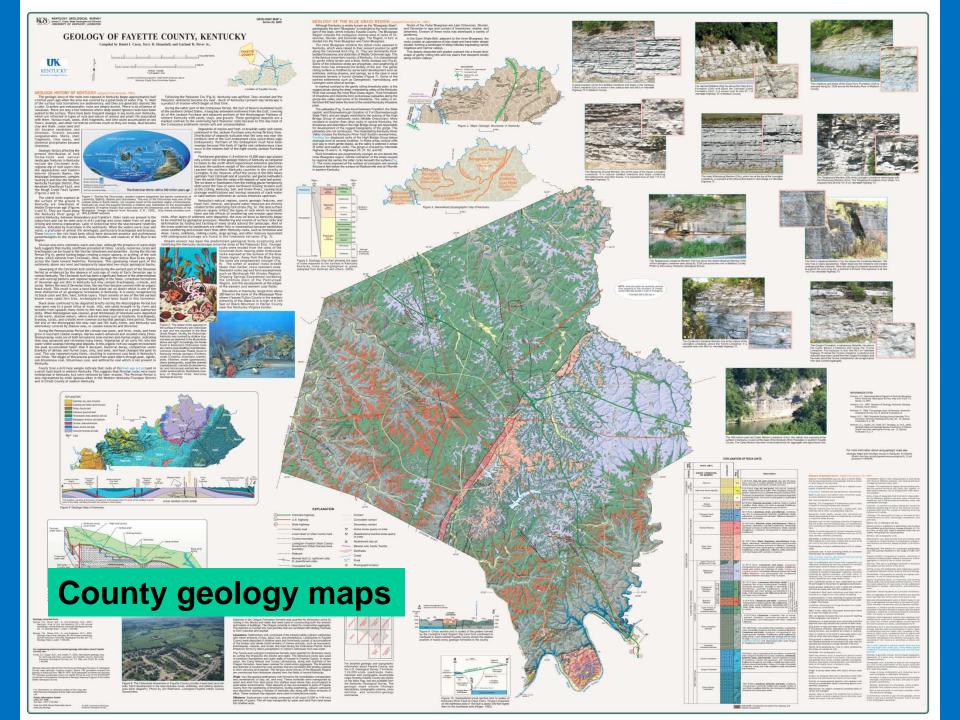
😜 Internet

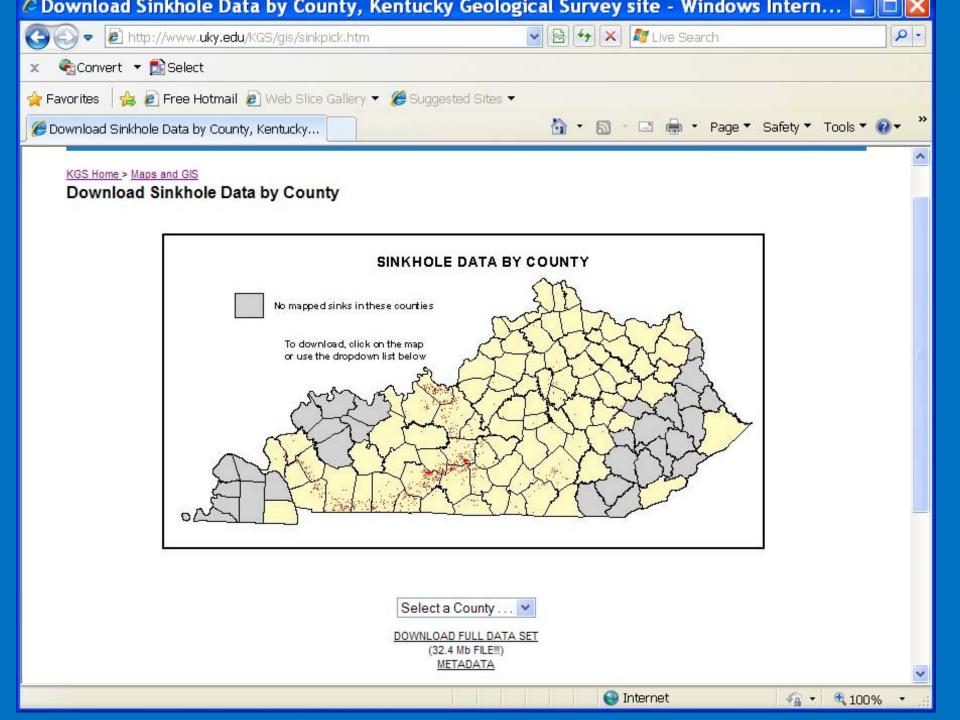
🐴 🔹 🔍 100% .

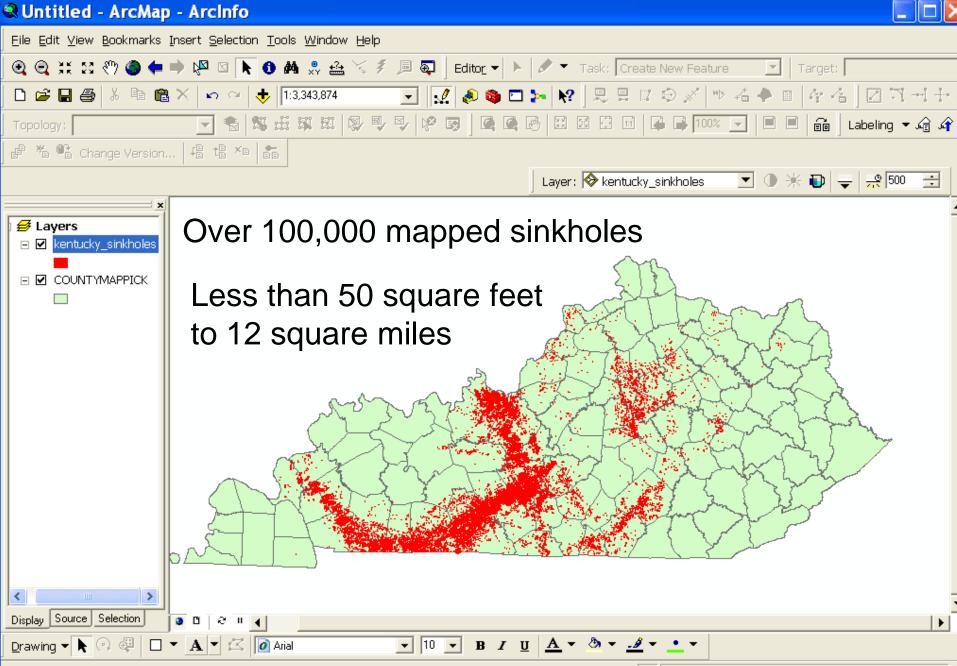


## Digital geology at 1:24,000 for entire state









4222359.951 4146696.965 Feet

## Mapping underground flow paths in karst with ArcGIS



In the second second second

file operation in the second riterers als think is singled in terrain 2 whiteled as a rear בי בשיעה איז איני ביי אלגע עין אינירייני and the state of the

rates lader duck shalls add

\* Kahilapingka Salamyana musi hanyi \* Ingin - gana La Paluphi mujikanan \*\* Kahilapingka musi kana ang mujikana musi kana ang mujikana ang mujikan Kana ang mujikana Kana ang mujikana Kang mujikana ang mujikana Nusi kang mujikana ang muj Nusi kang mujikana ang muji The party of the second s A before the set of th <sup>10</sup> Constitution in the first state of any first difference between the constitution in the first state of a state of Som/Arab n. M. S. Vershammerkani until

4 Sq +100, 17 y T Manual A. (To count in an Name County includents of a linear

pers. Filler Verster, Nationalet Healigner, Harr,

Construction Carries terin A representative A . & cast mean time fre They, \$1, 10, 10 areas to some to the cost of the state o

the state of the s

and the second sec Photo State Andreas State Andreas State

" Interfact to Associate the Barry Vision To Statistics · Debut Abire at least in a rest of a range <sup>10</sup> Delevit, Weiderstein bei Schlass für v

· Kan physic rubble works the second

tractif, its in some in our dust hat give local, "I below?, its is not

an land, sa bagan ang

and the second s 

the first Report to the state in the state of the second state of What Life is your photoers when a beyond

The VIA SHITTER PLET FOR

term d. 7 May in the hit for provide the first Street, Lot and

and the second s And the second sec the lot of the surger of the s

bertiftent wie imele stater mer in Andrik (mark a servaire out) date start an find a state of the find the first of the \* (aug 1, as and A.S.A. above a providence at the base of a Malay dataset a particular to a (\* ) Barbary T. (B. ) Spilling parts a set day line day (Part Margan and and part and provide the start of the st

With a first state of a sub-transmission of a sub-Exhibition definition of the mark the Wyiss-

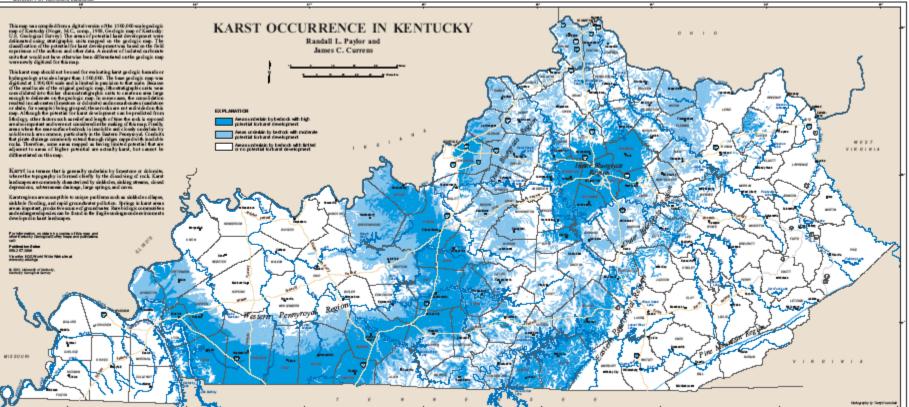
**論**•

22

Contraction of the

## Mapping Karst Geology

#### NEW TUCKY GERLOGKAL SURVEY



BAP AND CHART 33 Series 23, 25 CT

🖉 Geospatial Data Library, Maps and GIS Kentucky Geological Su	urvey site - Windows Internet Explorer	
💽 🗢 🖉 http://www. <b>uky.edu</b> /KGS/gis/kgs_gis.htm	🖌 🗟 🗲 🔀 Live Search	. م
🗙 🔩 Convert 🔻 🛃 Select		
🚖 Favorites 🛛 🚖 🙋 Free Hotmail 🙋 Web Slice Gallery 🔻 🏈 Suggested Sites 👻		
🥖 Geospatial Data Library, Maps and GIS Kentu	🏠 🔹 🔝 🔹 🖶 🝷 Page 👻 Safety 💌	Tools 🔻 🔞 👻
KCS Kentucky Geological Survey		^
University Of Kentucky Search KG8   Contact KG8   KG8	Home   UK Home	

#### KGS Home > Maps and GIS

#### Geospatial Data Library

The Kentucky Geological Survey and other state and federal agencies have electronic maps and GIS data that you can download for your use. The KGS GIS data are in ArcView shapefiles (registered by ESRI). The files were zipped using the WinZip utility. All the KGS datasets, unless explicitly noted, are in latitude and longitude, decimal degrees, NAD 83.

- Kentucky Geography Network: Electronic warehouse of maps and GIS data from the Kentucky Geography Network.
- Map Imagery : Scanned, georeferenced topographic, geologic, and other maps.
- <u>Elevation Data</u>: Digital elevation models at various scales.
- Political and physical boundary data: Maps (coverages) showing political boundaries, map indexes, regions, area development districts (ADD's), grids.
- <u>Geology and Soils data</u>: 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.

Contact Information: If you have any questions regarding the GIS information provided by the Kentucky Geological Survey, please contact <u>Dan Carey</u>, telephone (859) 257-5500, fax (859) 257-1147, Kentucky Geological Survey, 228 Mining and Mineral Resources Building, University of Kentucky, Lexington, KY 40506-0107

😜 Internet

🐴 🔹 🔍 100%

G	📀 🔻 🙋 http://www.uky.edu/KGS/gis/hydro.htm	🔽 🗟 🐓 🗙 🌌 Live Search	P .
х	🎨 Convert 🔻 🔂 Select		
🔶 F	avorites 🛛 👍 🙋 Free Hotmail 🙋 Web Slice Gallery 🔻	🥖 Suggested Sites ▼	
	🏈 State Hydrology Series, Kentucky Geological	in an	🔹 Tools 👻 🌘
^	State Hydrology Series		
	Hydrologic and watershed coverages		

Descriptions	Click to Download by FTP (file size)
Kentucky Water Resources Information System	Public Water and Sewer (KIA)
14-DIGIT HUCS	Download 14-digit HUCS
Hi-res National Hydrography Data	High-res data by basin (up to 22 Mb)
Hi-res National Hydrography Data	NHD 100k Streams by county (up to 280 Kb)
Hi-res National Hydrography Data	NHD 24k Streams by County (up to 1.7 Mb)
Hi-res National Hydrography Data	NHD 24k Waterbodies by County (up to 1.9 Mb)
TMDL data from KY DOW	TMDL data from KY DOW (KYGEONET)
USGS surface water monitoring sites	usgsgage.ZIP (0.04 Mb)
About USGS Peak Flow Stream Data	USGS Peak Flow Stream Data (KYGEONET)
About FEMA Q3 Flood Data	Flood Data (FEMA Q3) (KYGEONET)
Source-Water Protection Areas	Source-Water Protection Areas (KYGEONET)
305(b) Streams - Overall Use Support	Download 305(b) Streams - Overall Use Support (5.6 M
305(b) Streams - Swimming	Download 305(b) Streams - Swimming (1.4 Mb)
305(b) Streams - Fish Tissue Consumption	Download 305(b) Streams - Fish Tissue Consumption (C
305(b) Streams - Drinking Water	Download 305(b) Streams - Drinking Water (0.19 Mb)
305(b) Streams - Aquatic Life	Download 305(b) Streams - Aquatic Life (5.24 Mb)
Springs	springs.ZIP (2.5 Mb)
Water Wells	wwells.ZIP (2.5 Mb)
Groundwater Sensitivity Regions	sensitivity.ZIP (3.7 Mb)
Karst Dye Traces	karstdye.ZIP (0.7 Mb)
Kentucky Sinkhole Drainage Areas	Download Kentucky Sinkhole Drainage Areas (80Mb)

\*

305(b) Streams - Fish Tissue Consumption	Download 305(b) Stream
305(b) Streams - Drinking Water	Download 305(b) Stream
305(b) Streams - Aquatic Life	Download 305(b) Stream
Springs	springs.ZIP (2.5 Mb)
Water Wells	wwells.ZIP (2.5 Mb)
Groundwater Sensitivity Regions	sensitivity.ZIP (3.7 Mb)
Karst Dye Traces	karstdye.ZIP (0.7 Mb)
Kentucky Sinkhole Drainage Areas	Download Kentucky Sinkl
Karst Geology (500k)	karst500k.zip (1.1 Mb)
Named LakesKentucky Fish and Wildlife	KDFWR Named Lakes.zi
305(b) Lakes	Download 305(b) Lakes (
Regulated Dams	dowdams.ZIP (0.3 Mb)
Wetlands Inventory	Wetlands Maps
Wetlands Inventory	NWIP Wetlands by Count
Wetlands Inventory	Statewide wetlands (KY)
Wildlife Management Areas	KDFWR wmas 061603.

Catalog of Hydrologic Units

🕘 Internet

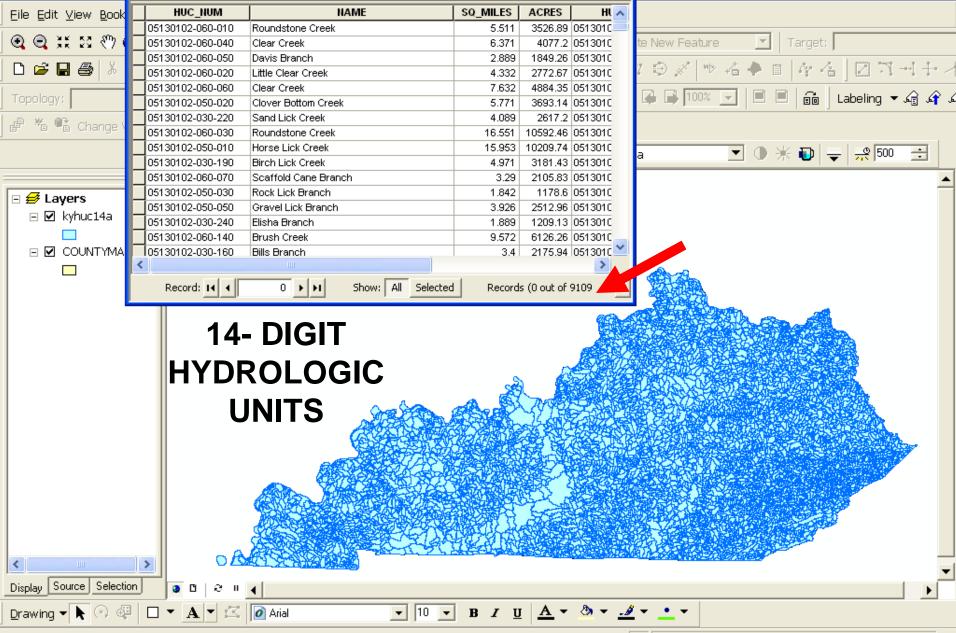
😪 Untitled - ArcMap	- Ar	cinfo												
_ Eile Edit ⊻iew Bookmarks I	(nsert	Selection Tool	ls <u>W</u> indow	<u>H</u> elp										
D 🚅 🗖 🎒 🕺 🖻 🖻	$\times  $	🗠 🗠 🔶 📘	:2,866,935	•	🧟 🔕	🖸 🋌	<b>N</b> ?							
🛛 Edito <u>r</u> 👻 🕨 🖉 🕶 Task: 🖡	Creat	e New Feature		Target:		T	]   × 0   I	•	1					
		100% 🗸												
► COUNTYMAPPICK		Wa		• 11 <sup>2</sup> - a	ty asse		53	s, 30	)5b					-
23		WATERSHED	Ohio River	<b>X_DIGIT</b> 5090203	HU COUNTY KENTON CO	WAH_C	AH PCR SC	R FISH_CO	DNSU DŴS	ASSESSMEN	<u>" ^ </u>	many C.	LI L	1
2 mg		Salt/Licking	Ohio River	5090203 5090203	KENTON CO	2-FS 2-FS	3 3	3	3	2		god f	1 mg	AN
and and		Satt/Licking	Ohio River	5090203	KENTON CO	2-FS	3 3	3	3	2	5	TY	i In	
7		Salt/Licking	Ohio River Ohio River	5090203 5090203	KENTON CO KENTON CO	2-FS 2-FS	33 33	3 3	3	2		>2 m	Aur	Show
		Salt/Licking	Ohio River	5090203	KENTON CO	2-13 2-FS	3 3	3	3	2		× 1× 1		
		Salt/Licking	Ohio River	5090203	BOONE CO	2-FS	3 3	3	3	2		SLY /	C X	and the second
		Salt/Licking	Ohio River	5090203	BOONE CO	2-FS	3 3	3	3	2				
		Satt/Licking	Ohio River Ohio River	5090203 5090203	BOONE CO BOONE CO	2-FS 2-FS	33 33	3 3	3 3	2				
		Satt/Licking	Ohio River Ohio River	5090203 5090203	BOONE CO	2-FS 2-FS	3 3	3	3	2				
+		Salt/Licking	Ohio River	5090203	BOONE CO	2-FS	3 3	3	3	2	~			
•	111	<								3				
	Ē	Record: 14	• •	1 🕨 🖬	Show: All Sele	ected	Records (0 ou	t of 7936 Sele	ected)	Options 👻	Ŀ	•		
541 Feet													4646099.8	363 441409



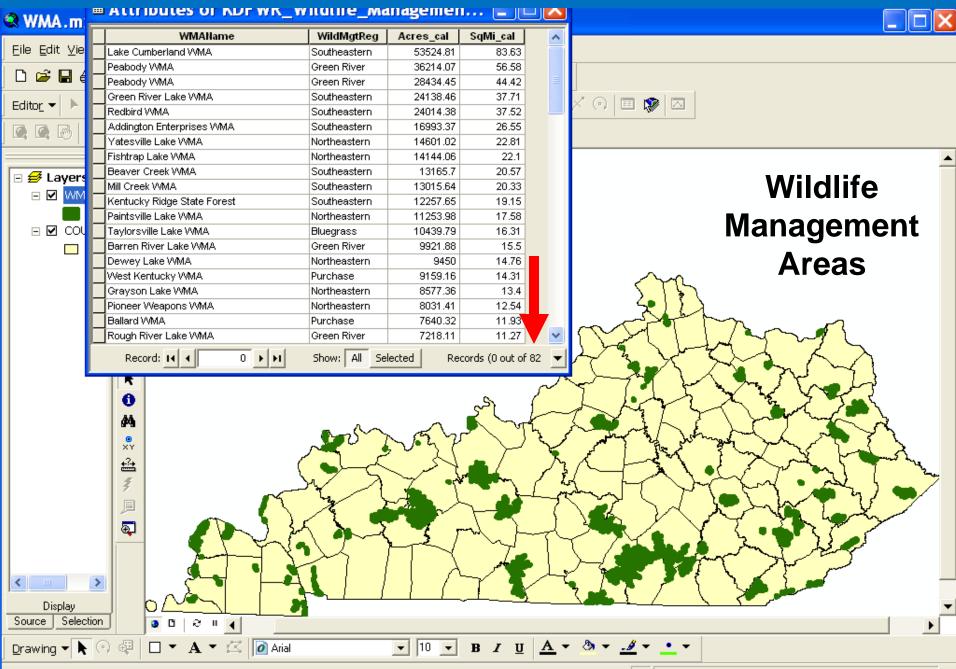
#### 🗬 HUC14.mxd 🛛 🗏 Attributes of kyhuc14a

#### 



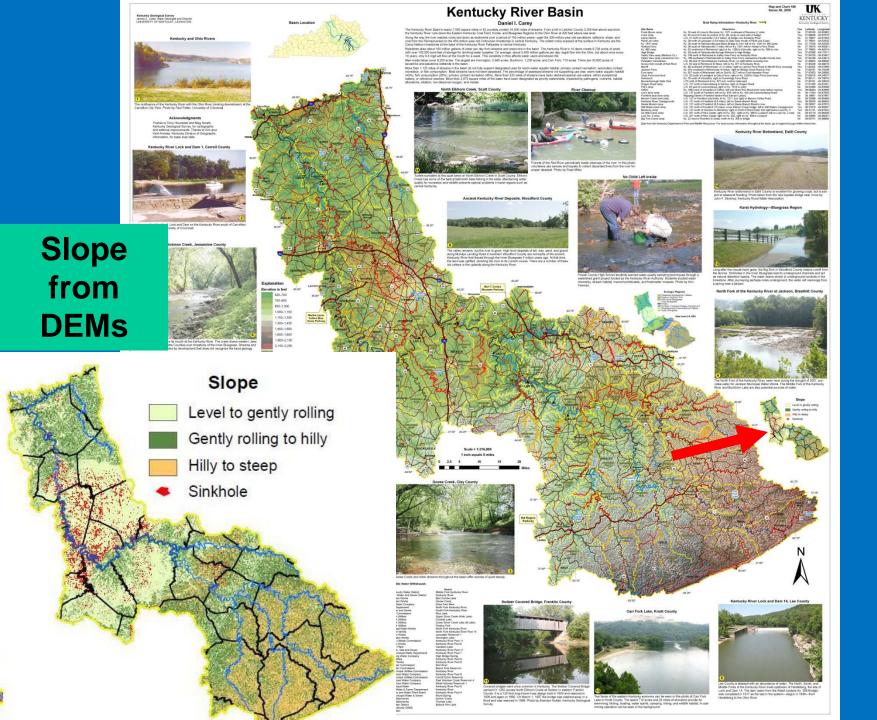


4516146.621 4159195.524 Feet



4133030.407 4016039.922 Feet

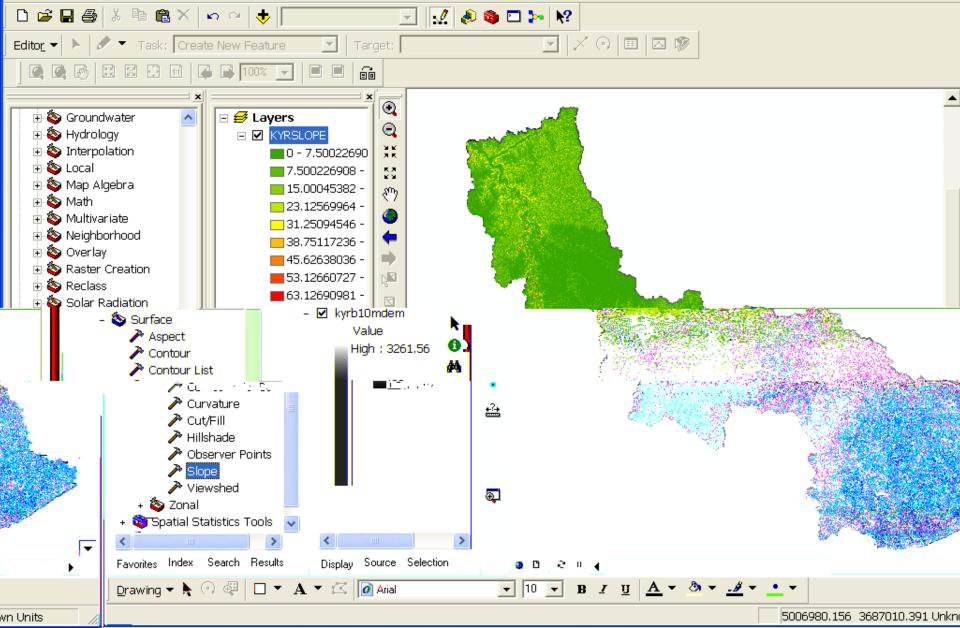
1



#### 📽 Untitled - ArcMap - ArcInfo

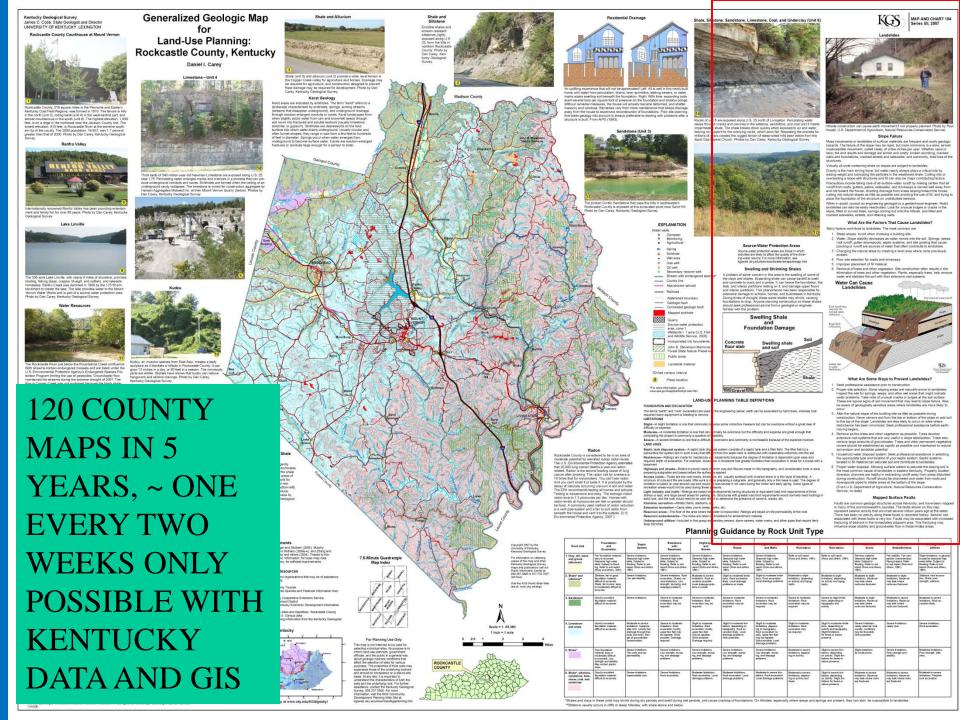


Eile Edit View Bookmarks Insert Selection Tools Window Help



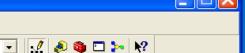
🥭 Geosp	atial Data Library, Maps and GIS Kentucky Geological Survey site - Windows Internet Explorer 🛛 🖃 🔀
00-	🖉 http://www.uky.edu/KGS/gis/kgs_gis.htm
🗞 Con	vert 🔻 🛃 Select
🚖 Favorites	🚖 🙋 Free Hotmail 🙋 Web Slice Gallery 🔻 🏈 Suggested Sites 🔻
🏉 Geospati	al Data Library, Maps and GIS Kentu
K	Kentucky Geological Survey
<u> </u>	University Of Kentucky, South KCS L Context KCS L KCS Home LIK Herrow
	GS Home >- Mape and GIS
	Geospatial Data Library
Π.	he Kentucky Geological Survey and other state and federal agencies have electronic maps and GIS data that you can download for your use. The KGS GIS data are in Arc View
	hapefiles" (registered by ESRI). The 'files' were zipped using the WinZip utility. 'All the KGS datasets, unless explicitly noted, are in latitude and longitude, decimal degrees, NAD 83.
	Kentucky Geography Network: Electronic warehouse of maps and GIS data from the Kentucky Geography Network.
	Map-Imagery: Scanned, georeferenced topographic, geologic, and other maps
	Elevation Data : Digital elevation models at various scales.
	Political and physical boundary data: Maps (coverages) showing political boundaries, map indexes, regions, area development districts (ADD's), grids.
	Geology and Soils data: Geologic coverages of the state, oil and gas wells, coal exploration sites.
	Hydrology data: Hydrologic and watershed coverages, water wells, karst dye traces, wetlands, NHD streams in Kentucky.
	Transportation data: Roads and highways in Kentucky.
	<ul> <li>County basemap data: From ESRI, TIGER/Line® filesroads, railroads, rivers, lakes, political boundaries, census statistical boundaries, etc., covering the entire United States by county or state.</li> </ul>
	Benchmark Data: National Geodetic Survey data.
	<u>Cohverter to convert latitude/brigitude in DMS to decimal degrees:</u>
	contact.Information; If you have any questions regarding the GIS information provided by the Kentucky Geological Survey, please contact <u>Dan Carey</u> , telephone (859) 257-5500, fax 359) 257-1147, Kentucky Geological Survey, Geological Survey, 228 Mining and Mineral Resources Building, University of Kentucky, Lexington, KY 40506-0107.
0	then sites related to Kentusky <u>GIS:</u>
	Kentucky Office of Geographic Information Systems
	USGSKentucky
	Kentucky Geography Network
	Kentucky Infrastructure Authority
	Kentucky Department of Fish and Wildlife Information System
::	😜 Internet 🤹 🔹 🔍 100% 🝷



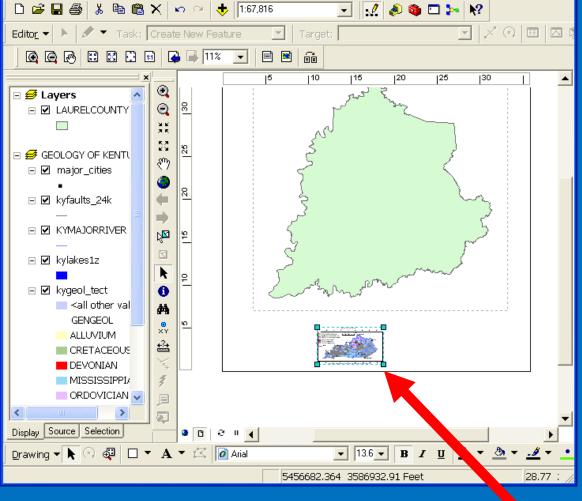




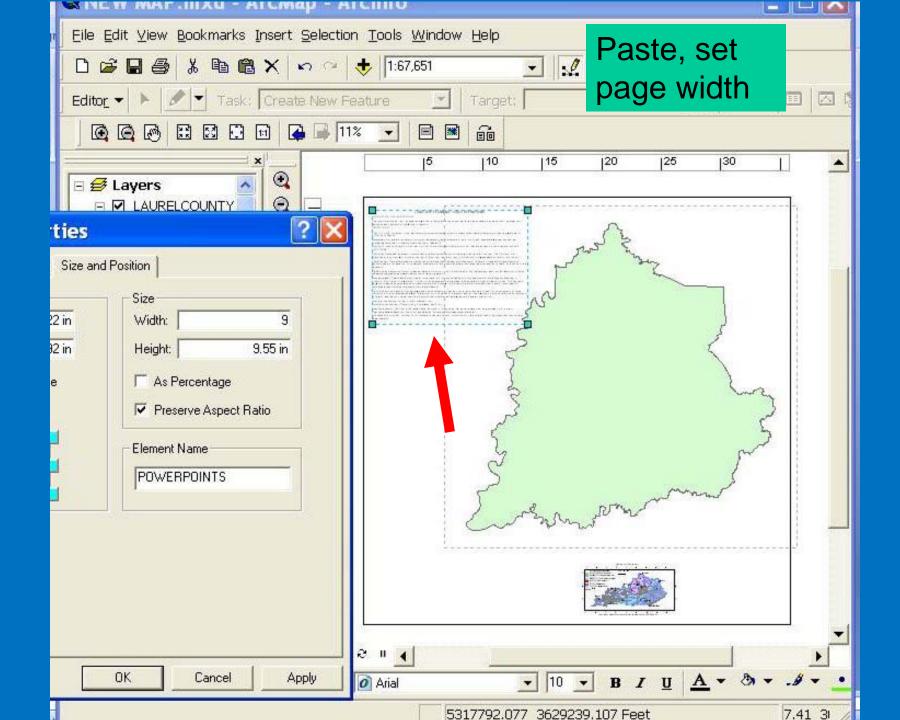
Eile Edit View Bookmarks Insert Selection Tools Window Help



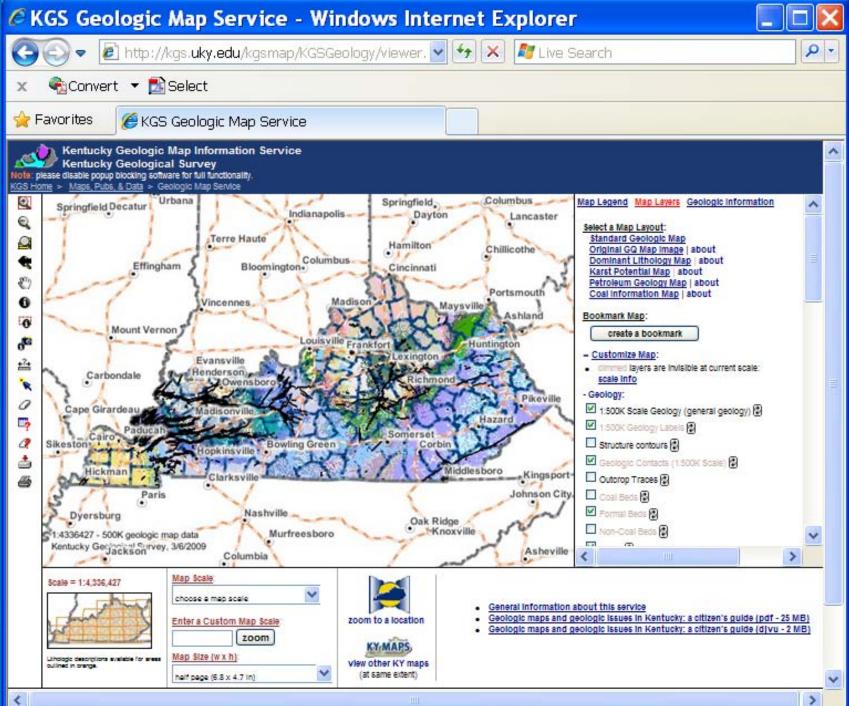
# Copy from one map layout to another



No margins, set page width, copy

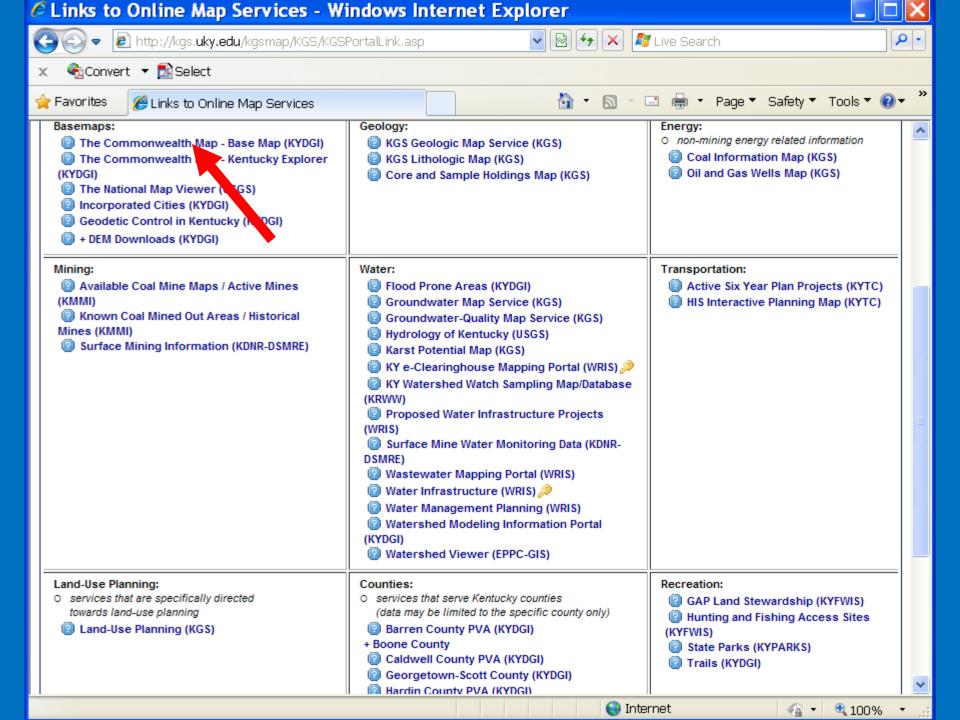


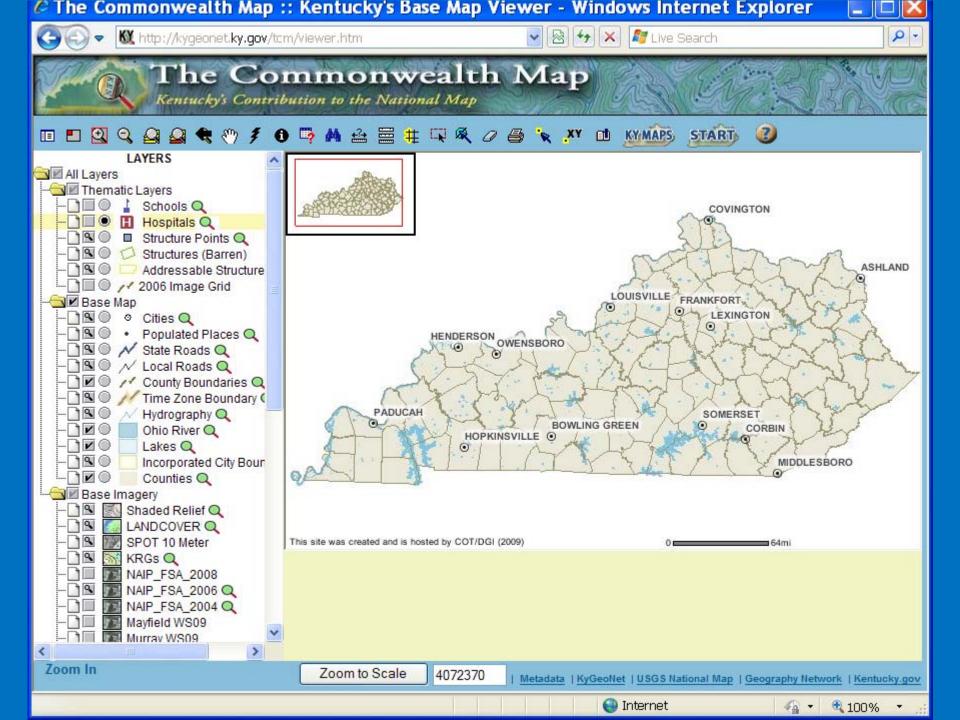
🖉 Maps and GIS Kentucky Geological Survey site - Windows Internet Explorer	
🚱 🕤 🔻 🛃 http://www. <b>uky.edu</b> /KGS/gis/index.htm	P -
🗞 Convert 🔻 🛃 Select	
🚖 Favorites 🛛 👍 🔊 Free Hotmail 🖉 Web Slice Gallery 🔻 🏀 Suggested Sites 👻	
🌈 Maps and GIS Kentucky Geological Survey site 👘 🔹 🗟 🔹 🖃 👘 🝷 Page 🔻 Safety 🔻 Tools	• 🕡 • »
KCS Kentucky Geological Survey	^
University Of Kentucky Search KGS   Contact KGS   KGS Home   UK Home	
KGS Home	
Maps and GIS	
GIS Data: Links to the best GIS data we know, whether KGS or someplace else.	
<ul> <li>Mapping and GIS Research: Summaries of KGS GIS mapping and research projects.</li> </ul>	
<ul> <li>Search for Published KGS Maps and Data: Search for KGS publications, maps, and data on oil and gas, water, coal, etc.</li> </ul>	
<ul> <li>Map and GIS Information: L inks to all kinds of maps, GIS data, and GIS information.</li> </ul>	
<ul> <li>Staff: List and e-mail contacts for everyone in the KGS Geospatial Analysis Section.</li> </ul>	
Geologic Map Information Service	
Interactive and customizable geologic maps with links to related data.	
County Land-Use Planning Maps	
Links to KGS land-use planning maps for Kentucky counties.	
Internet Map Services Search for information using interactive maps on the Internetoil and gas, water, coal, rock cores, geology, land-use and development planning.	
KGSGeoPortal	
Search for geographic areas in Kentucky and link to data and map web services for the same area.	_
Topographic and Geologic Index Maps	
Index maps and links to data.	
New Mapping and GIS Products at KGS Learn about the latest map and GIS products at KGS.	
Digitally Vectorized Geologic Quadrangles (DVGQ's)	
7.5-minute geologic map data for GIS.	_
The external links in these pages may open in a new browser window. If a new browser window has been opened and the Back button is not	
available, close the new window to return to these KGS pages.	
	~
🚱 Internet 🛛 🖓 🔹 🔍 100%	•

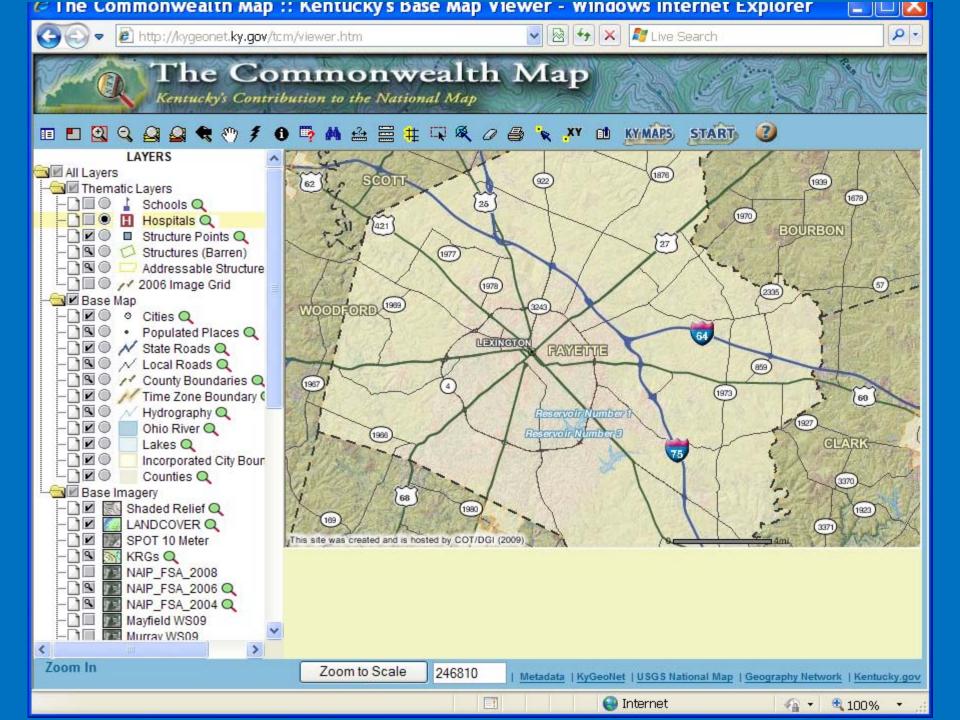


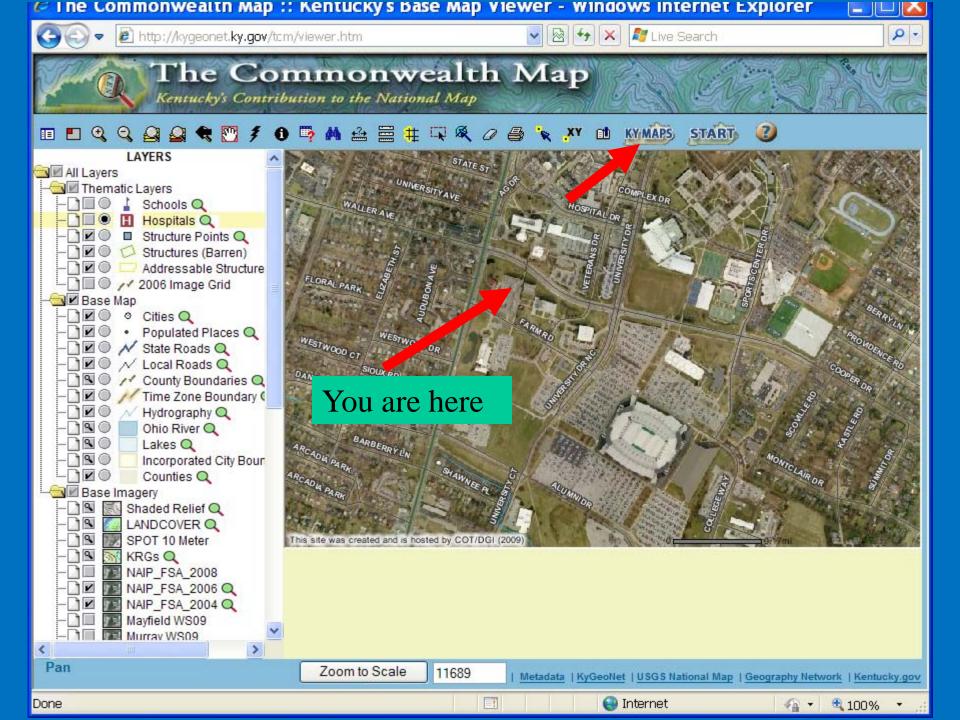
<

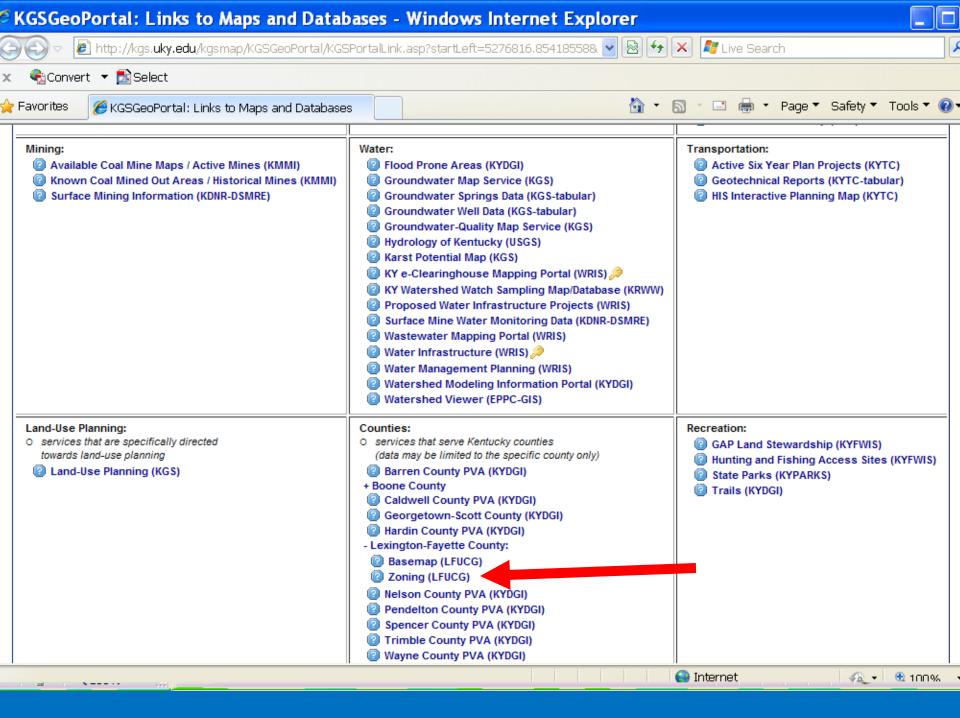
<ul> <li> <ul> <li></li></ul></li></ul>
<ul> <li>Favorites</li> <li></li></ul>
Maps and GIS Kentucky Geological Survey site       Image: Survey Survey         Image: Kentucky Geological Survey         University Of Kentucky       Search KGS   Contact KGS   KGS Home   UK Home         KGS Home
Kentucky Geological Survey         University Of Kentucky       Search KG8   Contact KG8   KG8 Home   UK Home         KGS Home
University Of Kentucky Search KGS   Contact KGS   KGS Home   UK Home
KGS Home
Maps and GIS
•
<ul> <li>GIS Data: Links to the best GIS data we know, whether KGS or someplace else.</li> </ul>
<ul> <li>Mapping and GIS Research: Summaries of KGS GIS mapping and research projects.</li> </ul>
Search for Published KGS Maps and Data: Search for KGS publications, maps, and data on oil and gas, water, coal, etc.
<ul> <li>Map and GIS Information: L inks to all kinds of maps, GIS data, and GIS information.</li> </ul>
<ul> <li><u>Staff</u>: List and e-mail contacts for everyone in the KGS Geospatial Analysis Section.</li> </ul>
Geologic Map Information Service
Interactive and customizable geologic maps with links to related data. County Land-Use Planning Maps
Links to KGS land-use rianning maps for Kentucky counties.
Internet Map Services
Search for information using interactive maps on the Internetoil and gas, water, coal, rock cores, geology, land-use and development planning.
KGSGeoPortal Search for geographic areas in Kentucky and link to data and map web services for the same area.
Topographic and Geologic Index Maps
Index maps and links to data.
New Mapping and GIS Products at KGS
Learn about the latest map and GIS products at KGS. Digitally Vectorized Geologic Quadrangles (DVGQ's)
7.5-minute geologic map data for GIS.
The external links in these pages may open in a new browser window. If a new browser window has been opened and the Back button is not
available, close the new window to return to these KGS pages.
. Channag with polic MCCV, and a second s











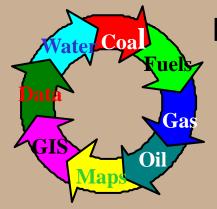
## ArcGIS classes mcrawford@uky.edu



Dan Carey -- carey@uky.edu

kgs.uky.edu/kgsweb/download/nov18.pptx kgs.uky.edu/kgsweb/download/nov18.pdf





### Kentucky Geological Survey The University of Kentucky

"Earth Resources—Our Common Wealth"

