

# Geographic Information Systems: Big Data - Big Information

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<http://gis.ky.gov>

## Keeping Current Seminar

Wednesday January 31<sup>st</sup>, 2018

4:00 PM – 4:30 PM

Computer Science Department

1<sup>st</sup> Floor Theater

Davis Marksbury Building – Lexington Campus

University of Kentucky



## Geographic Information System (GIS)

The primary responsibilities of the Division of Geographic Information (DGI) are the maintenance of the Commonwealth's enterprise Geographic Information Systems (GIS) services, on-going support of the [Kentucky Geography Network](#), and oversight of the [KYFromAbove](#) Program. DGI collaborates with geospatial publishers to provide a wealth of GIS-related information, including downloadable data sets, web mapping services and map products. These valuable resources support education and training, research, decision support, and policy development for a multitude of organizations in Kentucky and across the United States.

Looking for GIS Data? Try the powerful search capabilities of the [KYGeoportal](#) to locate maps and geographic data content for a particular part of the state or search based on keyword or content type.

If you are not looking for GIS data, but want to explore some web maps please browse the currently highlighted content using [KyGovMaps](#) page or check out our guidance documents on how to connect directly to our ArcGIS Server services.

We encourage you to share ideas and information with Kentucky's Geographic Information Systems (GIS) community through the [KYGIS listserv](#).



Kentucky Division of Geographic Information

<http://gis.ky.gov>

### Contact Information

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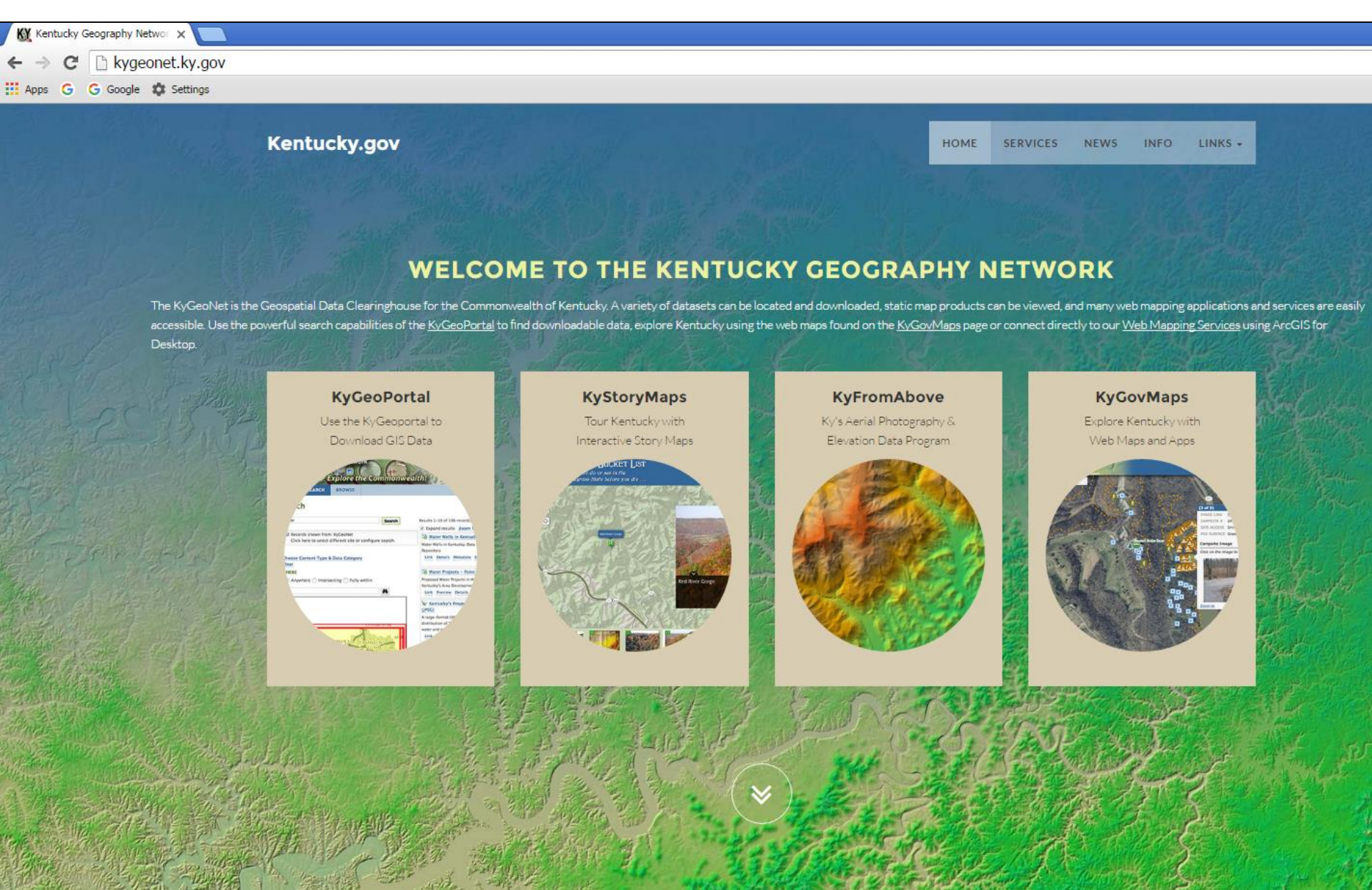
### Office Location

Commonwealth Office of Technology  
Kentucky Division of Geographic  
Information  
669 Chamberlin Avenue  
Frankfort, KY 40601

[View Map](#)

[Additional Map](#)

This page was last modified 11/7/2017 10:21 AM

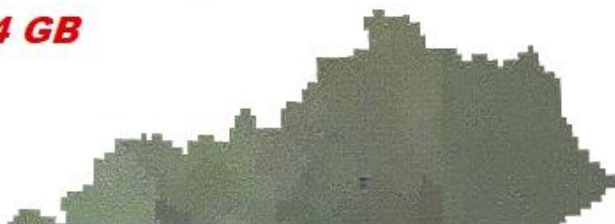




# National Agricultural Imagery Program (NAIP) - 8 bit

2004 - 3 band - 1 meter

**554 GB**



2006 - 3 band - 0.6 meter

**1.46 TB**



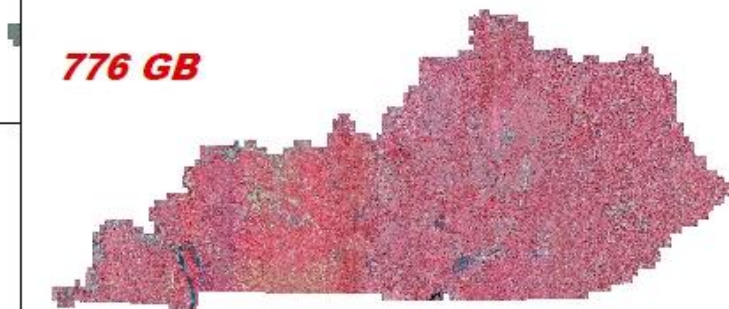
2008 - 3 band - 1 meter

**564 GB**



2010 - 4 band - 1 meter

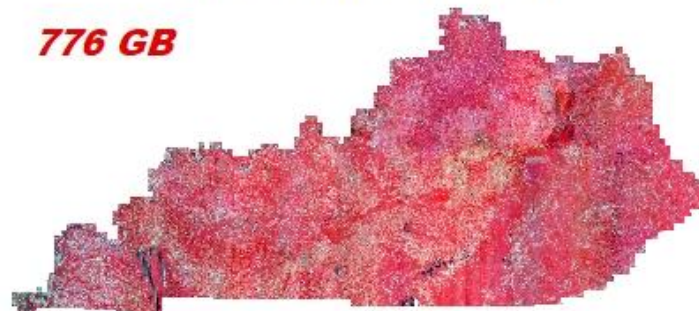
**776 GB**



USDA, DGI

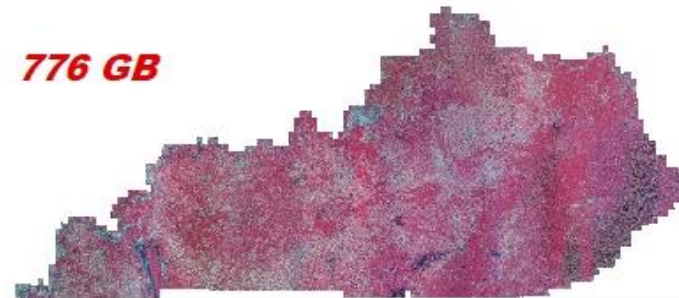
2012 - 4 band - 1 meter

**776 GB**



2014 - 4 band - 1 meter

**776 GB**



2016 - 4 band - 0.6 meter

**1.93 TB**



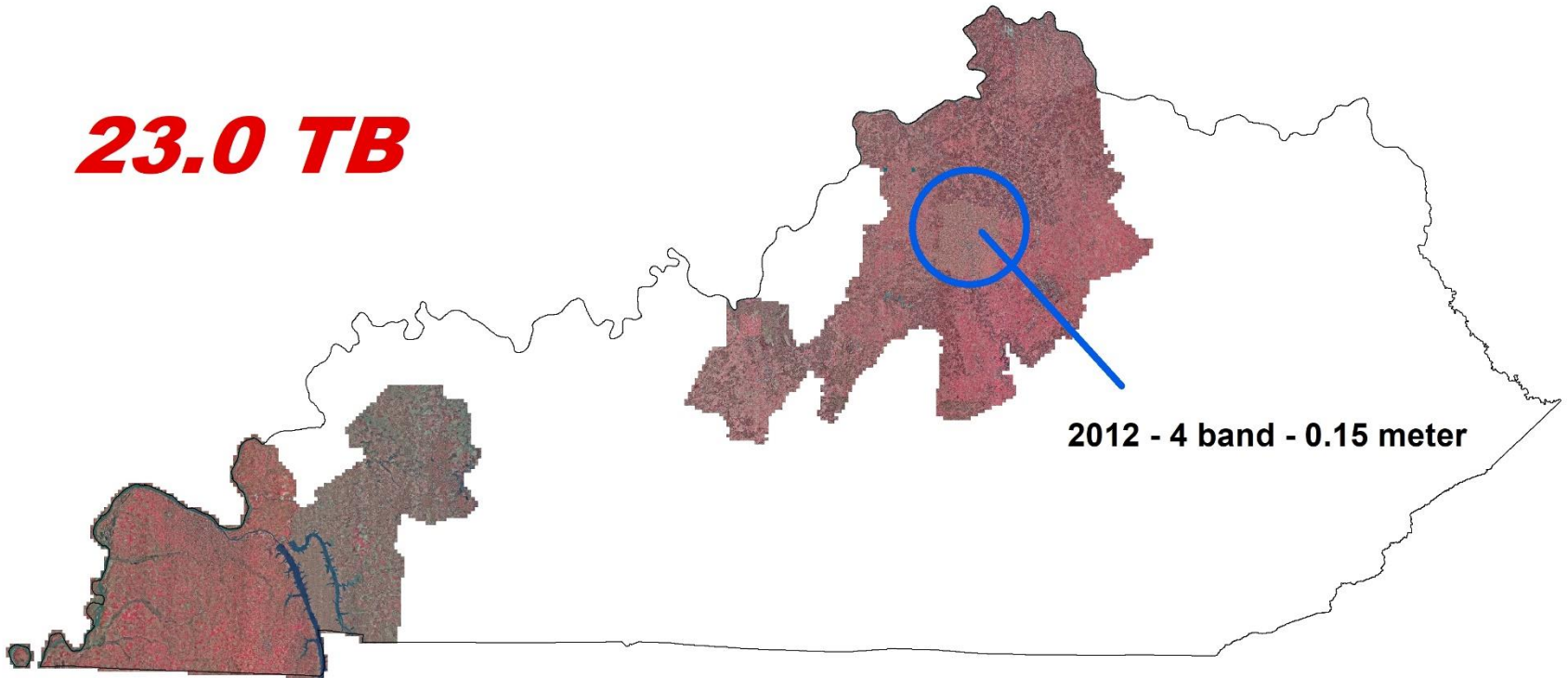
USDA, DGI

# Kentucky Aerial Photography and Elevation Data Program (KYAPED)

- 8 bit -

2012 - 4 band - 0.30 meter  
2013 - 4 band - 0.30 meter  
2014 - 4 band - 0.30 meter

***23.0 TB***



2012 - 4 band - 0.15 meter

# KY From Above Program Status

- **2012** – “Golden Triangle”
- **2013** – “Purchase”
- **2014** – “Western Kentucky”
- **2015** – “Central Kentucky”
- **2016** – “South Central Kentucky”
- **2017** – **Completed!!**

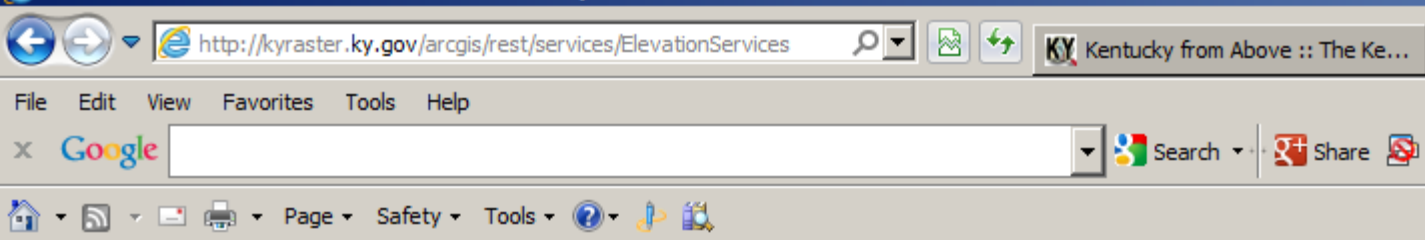
*Data is available for download or via service for all acquisition periods through 2017. Data acquired in 2017 is already partially available*

# Website



<http://kygeonet.ky.gov/kyfromabove/>





## ArcGIS REST Services Directory

[Home](#) > [services](#) > [ElevationServices](#)

[JSON](#) | [SOAP](#)

### Folder: ElevationServices

**Current Version:** 10.11

**View Footprints In:** [ArcGIS.com Map](#)

#### Services:

- [ElevationServices/Ky DEM KYAPED 5FT Hillshade](#) (ImageServer)
- [ElevationServices/Ky DEM KYAPED 5FT PercentSlope](#) (ImageServer)
- [ElevationServices/Ky DEM KYAPED 5FT ShadedRelief](#) (ImageServer)
- [ElevationServices/Ky DEM KYAPED 5FT](#) (ImageServer)
- [ElevationServices/Ky DEM LOJIC 2009 5FT](#) (ImageServer)
- [ElevationServices/Ky DEM USGS 10M](#) (ImageServer)
- [ElevationServices/Ky Hillshade 10M](#) (ImageServer)
- [ElevationServices/KY ShadedRelief USGS 10M](#) (ImageServer)
- [ElevationServices/Ky Slope USGS 10M](#) (ImageServer)

**Supported Interfaces:** [REST](#) [SOAP](#) [Sitemap](#) [Geo Sitemap](#)

<http://kyraster.ky.gov/arcgis/rest/services/ElevationServices>



# KYAPED Questions?

**Kent Anness**

**KYAPED Program Manager**

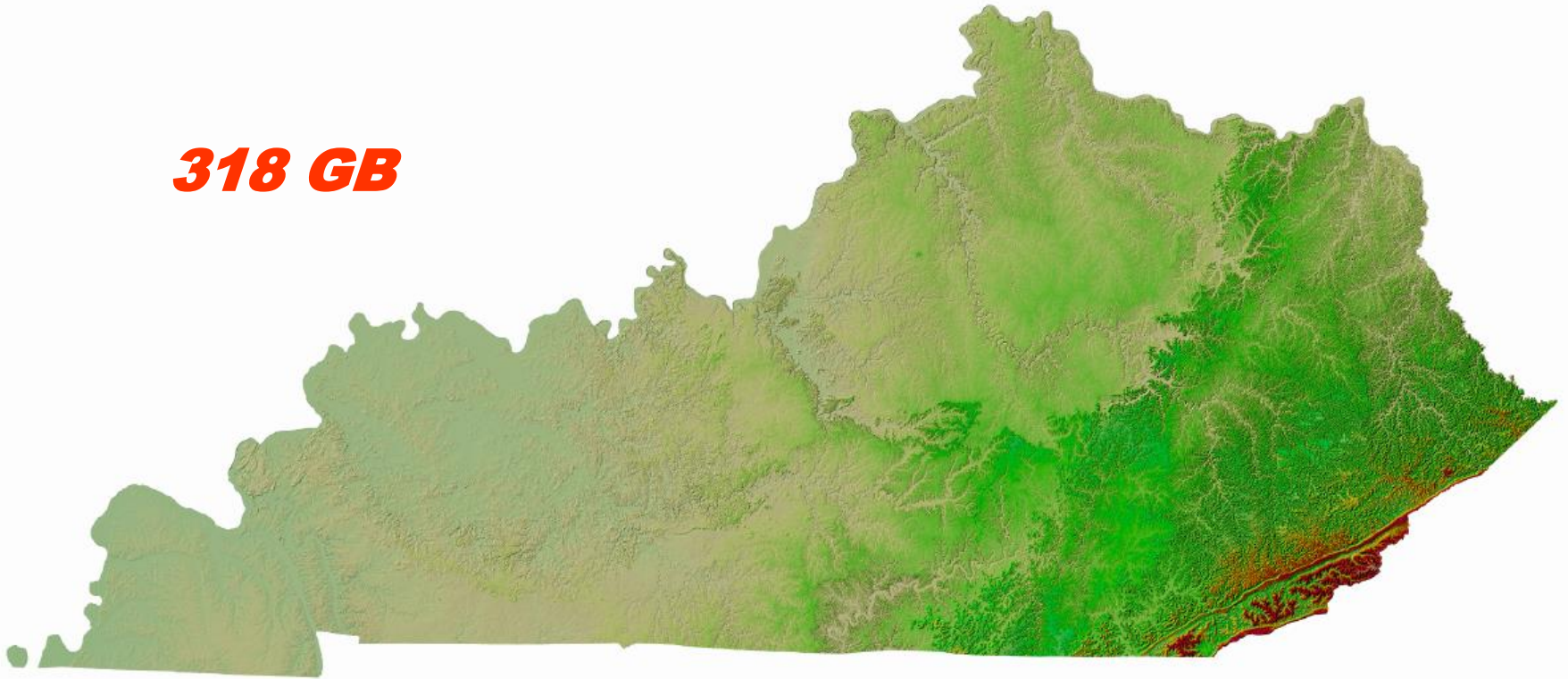
*Geographic Information Systems Branch - COT*

**[kent.anness@ky.gov](mailto:kent.anness@ky.gov)**

Website: **<http://kygeonet.ky.gov/kyfromabove/>**

# LiDAR Coverage Complete!

***318 GB***



# Kentucky Aerial Photography and Elevation Data Program (KYAPED)

Digital Elevation Model (LiDAR derivative) - 1.5 meter - floating point

## *Derivatives:*

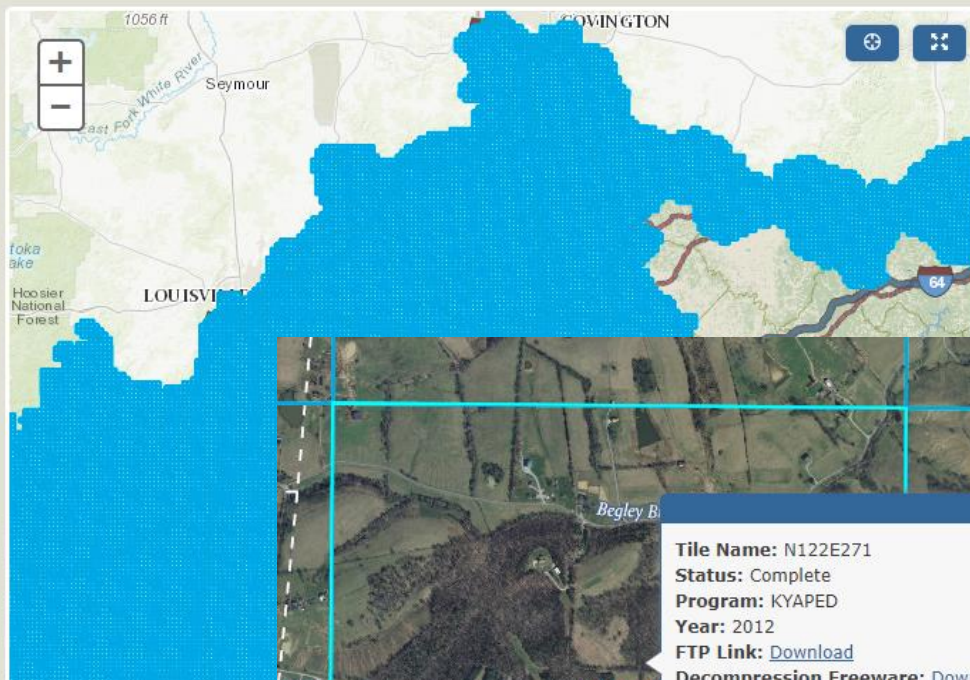
- *Slope*
- *Contour lines*
- *Volumetrics*
- *3D visualization*
- *etc.*



## KyFromAbove

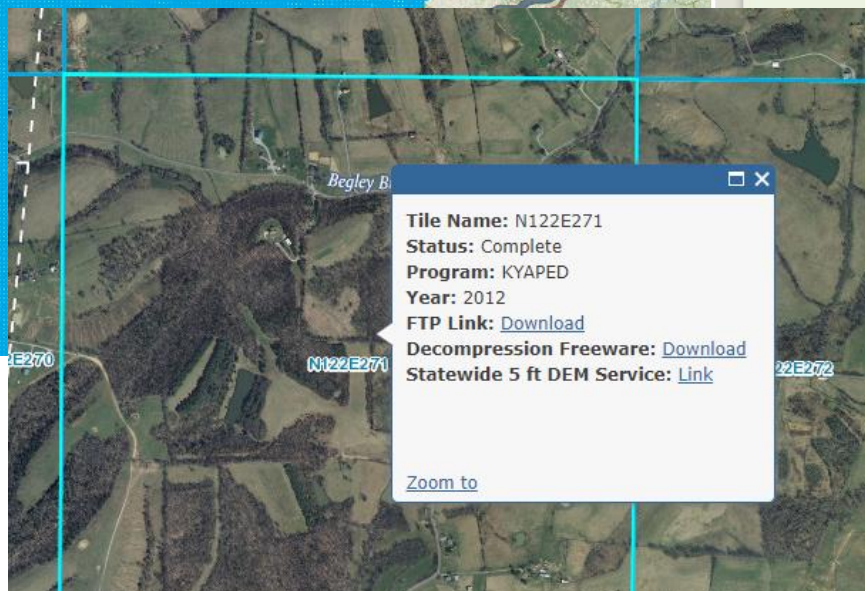
## Kentucky LiDAR Point Cloud Data

This web map provides access to LiDAR point cloud data tiles for the Commonwealth of Kentucky. This data was used to create the 5 foot Digital Elevation Model (DEM). Information regarding year acquired is included in the attributes.

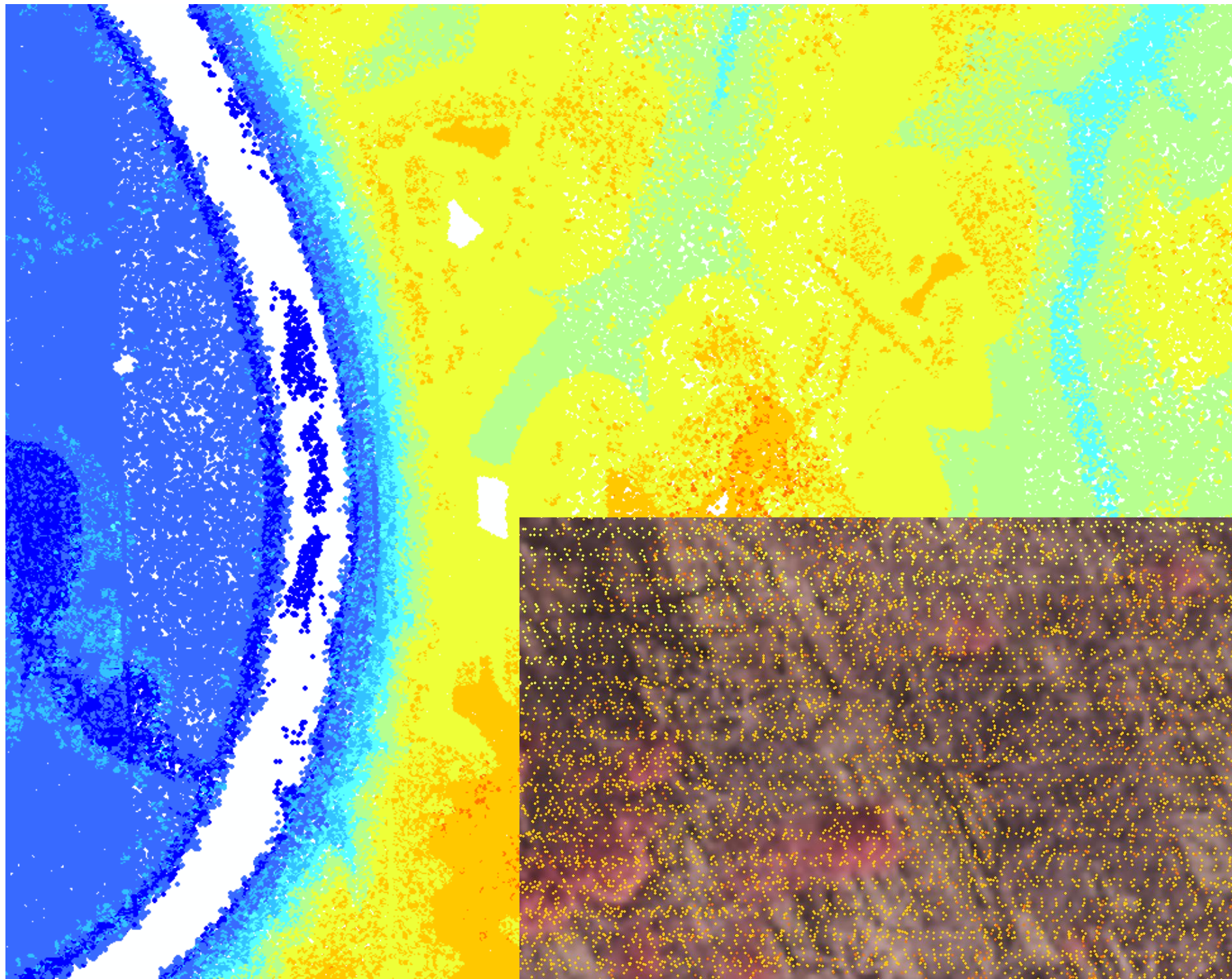
[Switch Basemap](#)

### Legend

Kentucky Point Cloud  
Tiles  
KYAPED Point Cloud Tile  
Index







# Open Source (not necessarily free)

- LAS to LAZ conversion
  - laszip.exe (Rapid Lasso Tools by Martin Isenburg)
  - rapidlasso (<https://rapidlasso.com/author/downtownfarm/>)
  - Compression ratio: approx. 10 – 20 %

**46,105 tiles (5,000 x 5,000 US Survey Feet)**

**COMPRESSED (.laz)= 2.2 TB**

**DECOMPRESSED (.las)= 15-20 TB**

# Some Pointers

- “Data science”
- Sensors on UAV/UAS (“drones”) platforms creating Pbytes as we speak

## *Methods/Output/Applications:*

- Dense Image Matching - correlation
  - Digital Surface Models
  - LiDAR and other sensors (thermal IR, multispectral)
  - 3D visualization – VR/AR
  - etc.
- Data fusion
  - Information from data: machine learning, computer vision, etc.
  - “Analytics”
  - Etc.

# THANK YOU!!

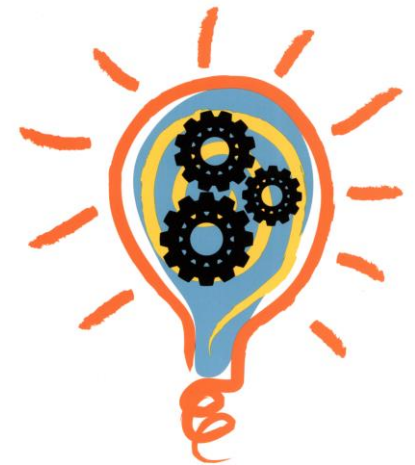
## Questions??

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# KENTUCKY

