

# Kentucky's Approach to Risk Assessment

KENTUCKY OFFICE OF ENERGY POLICY

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APRIL 4, 2023



# Focus Programs for OEP

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Kentucky ESF-12

Risk Overview

Tools to Use

# Kentucky ESF-12

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Kentucky ESF-12 responsibilities are shared between the Kentucky Office of Energy Policy (OEP) and the Kentucky Public Service Commission.

We are housed in the Kentucky Energy and Environment Cabinet which allows for coordination with ESF 3 and 10 along with Forestry and Natural Resources.

Kentucky ESF-12 success revolves around risk awareness, situational awareness, “staying one step ahead of an impact”, planning integration, and relationships.

- Understanding interdependencies
- Response is relationships

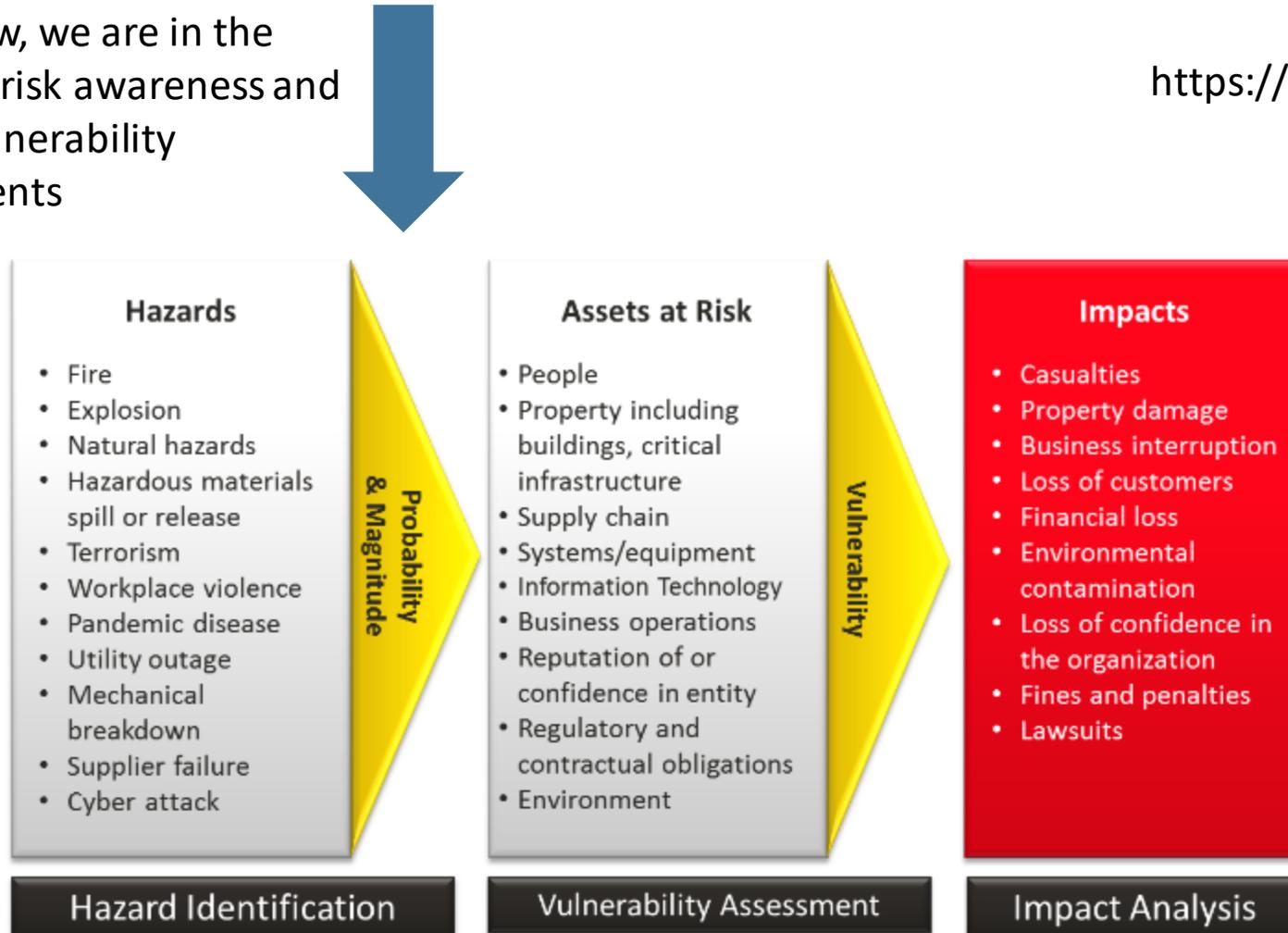
We couldn't get through many of our activations without coordination through NASEO, DOE, and our ESF colleagues in other states.



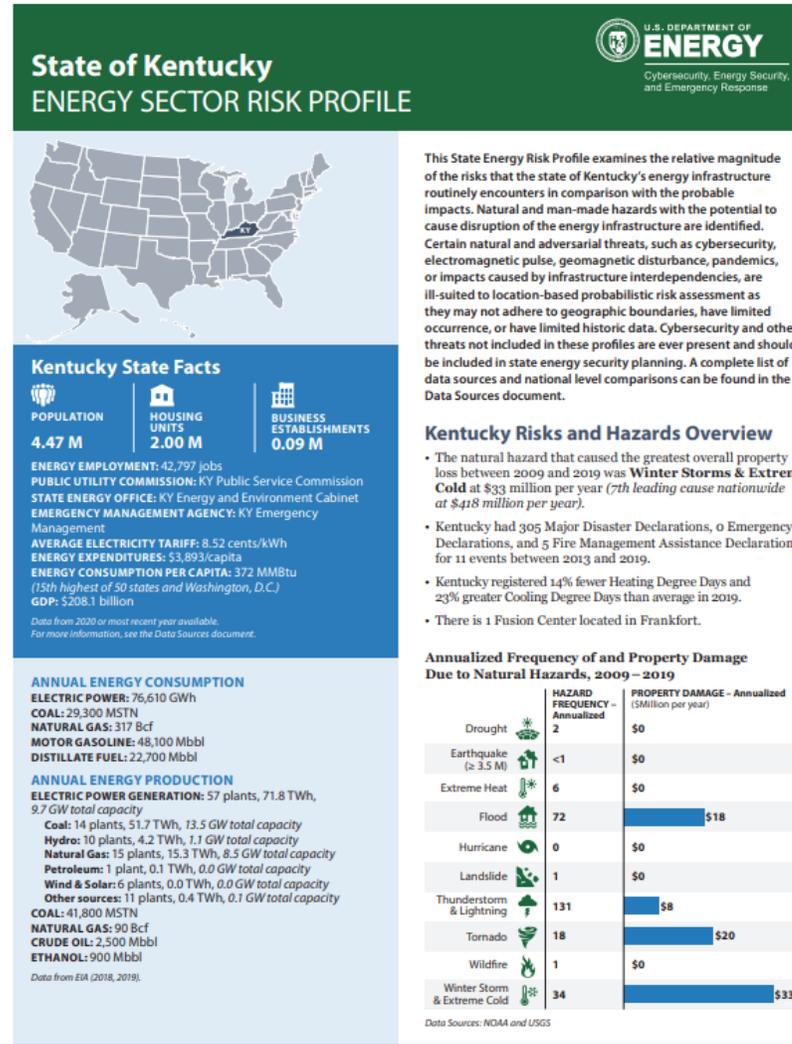
# Where's KY ESF-12 working?

Right now, we are in the realm of risk awareness and some vulnerability assessments

<https://www.ready.gov/risk-assessment>



# Step #1: Finding Your Risks



# State and County Plans

## 2022 FRANKLIN COUNTY/CITY OF FRANKFORT HAZARD MITIGATION PLAN

BLUEGRASS AREA DEVELOPMENT DISTRICT



### Kentucky Emergency Management

- Who We Are
- News
- Preparedness
- Programs
- Recovery
- Subrecipient Monitoring
- Training / Exercise
- Travel
- Weather



Home / Recovery / 2018 Kentucky Hazard Mitigation Plan

### 2018 Kentucky Hazard Mitigation Plan

CK-EHMP 2018, S1-S2, Planning Process, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 1, Revised Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 2, Flooding, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 3, RL, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 4, Dam, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 5, Drought, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 6, Earthquakes, Revised Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 7, Landslides, Revised Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 8, Karst, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 9, Mine Subsidence, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 10, Winter Storms, Revised Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 11, Wind, Revised Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 12, X-Temp, Revised Submittal	<a href="#">View</a>
CK-EHMP 2018, S3-S6, Risk Assessment, Hazard Identification, 13, Wildfire, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S7, Risk Assessment, Changes, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S8-S11, Mitigation Strategy, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S12, State Mitigation Capabilities, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S13-S16, Local Mitigation Policies, Programs, Capabilities, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S17-S18, Plan Review, Evaluation, and Implementation, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S19, Adoption, Original Submittal	<a href="#">View</a>
CK-EHMP 2018, S20, Assurance, Original Submittal	<a href="#">View</a>



ENERGY AND  
ENVIRONMENT CABINET

# Step #2: Mapping your Infrastructure and Critical Interdependencies

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We are a GIS office.

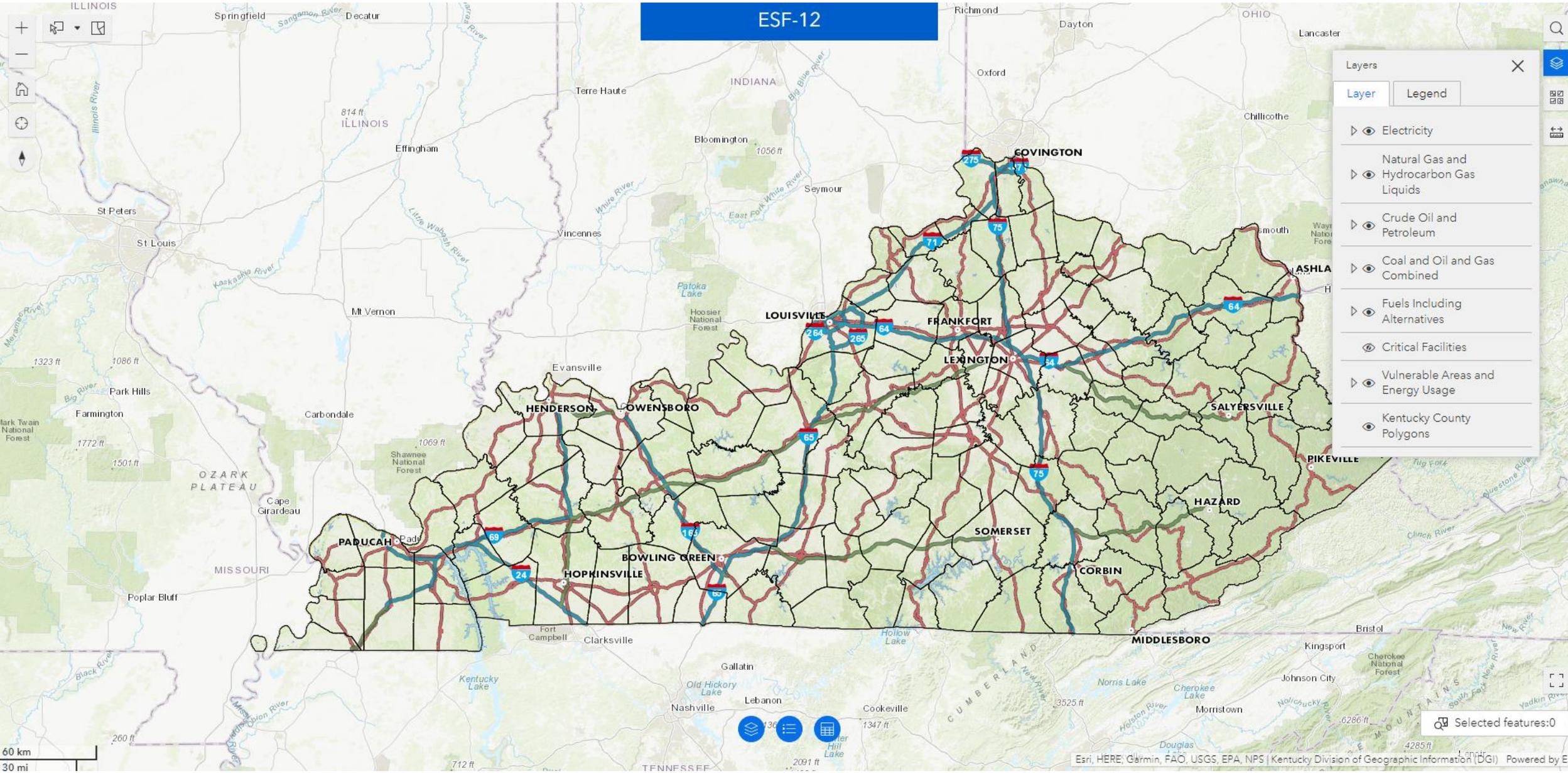
- EIA Energy Atlas
- HFLID Resources

ReadyOp allows for sharing across various ESFs of critical information

# ESF-12

Layers

- Layer Legend
- Electricity
- Natural Gas and Hydrocarbon Gas Liquids
- Crude Oil and Petroleum
- Coal and Oil and Gas Combined
- Fuels Including Alternatives
- Critical Facilities
- Vulnerable Areas and Energy Usage
- Kentucky County Polygons





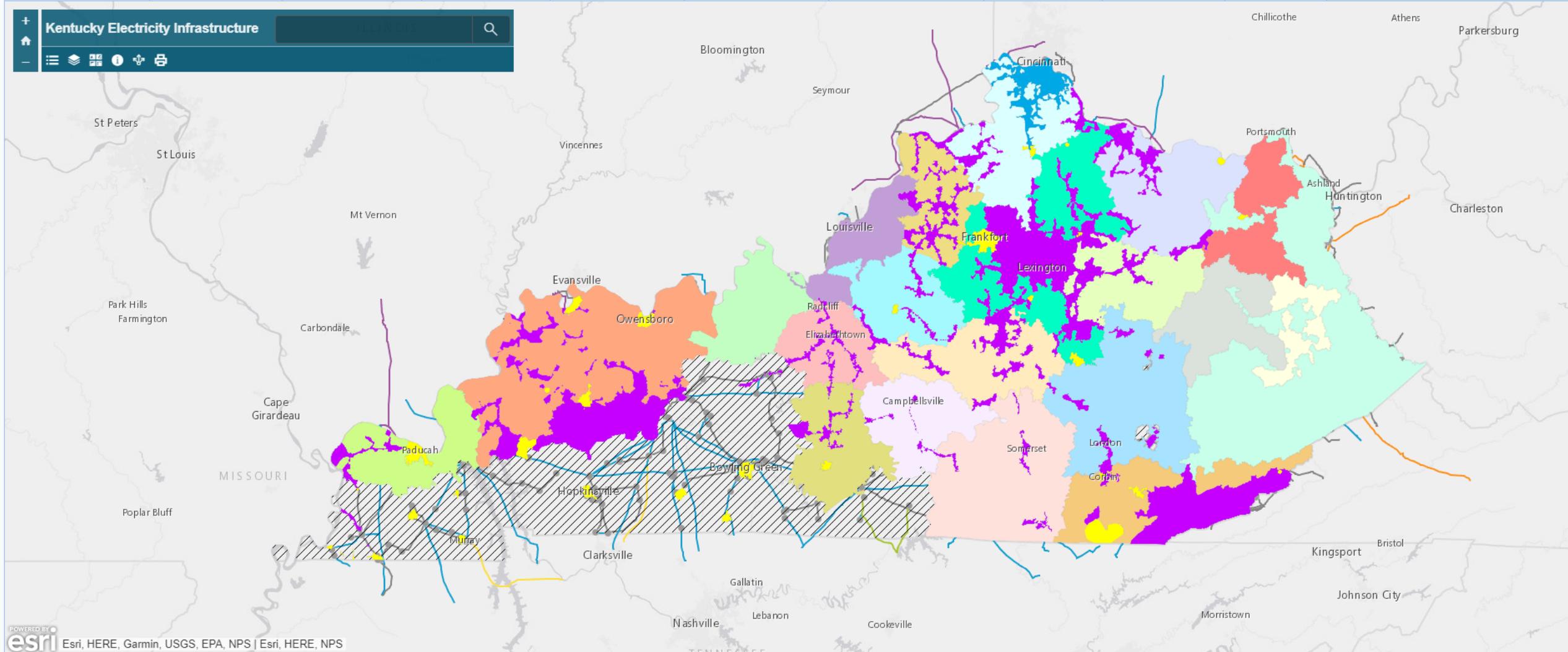
Kenya Stump (Agency Administrator) - You are currently online

Main Dashboard	Files	Roster	Dispatch	Logbook	Tracking	Forms	Emergency Response Team	County and Area EMs	Great Rivers Sub Area	Louisville Sub Area Plan	KY ERT Response Map (State Netwo	Drinking Water System Status	Wastewater Systems	Chemical Suppliers	Petroleum Sector
Petroleum Master Map	Midwest Transportation Fuel Flow	Electric Utility Sector	KY Electric Infrastructure	Natural Gas	Natural Gas Map	Fuel Infrastructure	EAAG	Vessel System	Highway & River Cameras	COVID-19 World Map	COVID-19 Kentucky Map	Public Health COVID-19			
KY Public Health Dashboard	Wild Turkey Camp Nelson	Gas Buddy Outage Tracker	Marion Water Dashboard	Waste Water GIS Mapping	Drinking Water GIS Mapping	KYTC Stream Work Dashboard	KYEM Ops Dashboard	KYTC Road Status Map	ReadyOp Tutorials						

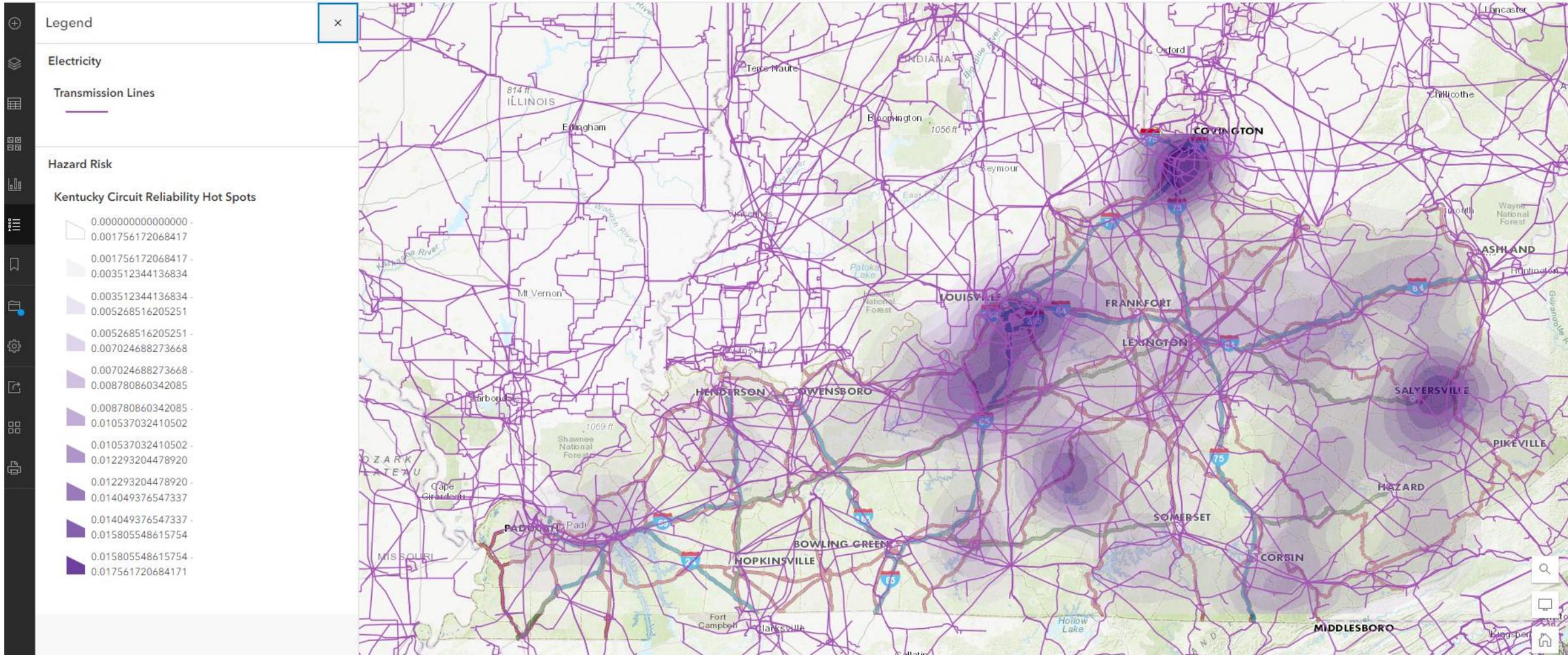
**Kentucky Electricity Infrastructure**

Search:

Home, Layers, Full Screen, Print, Share, Refresh icons



# Step #3: GIS Overlaying Risk Layers



[Details](#) [Add ▾](#) [Edit](#) [Basemap](#) [Analysis](#)

[Save ▾](#) [Share](#) [Print ▾](#) [Directions](#) [Measure](#) [Bookmarks](#)

[Info](#) [Layers](#) [Full Screen](#)

Legend

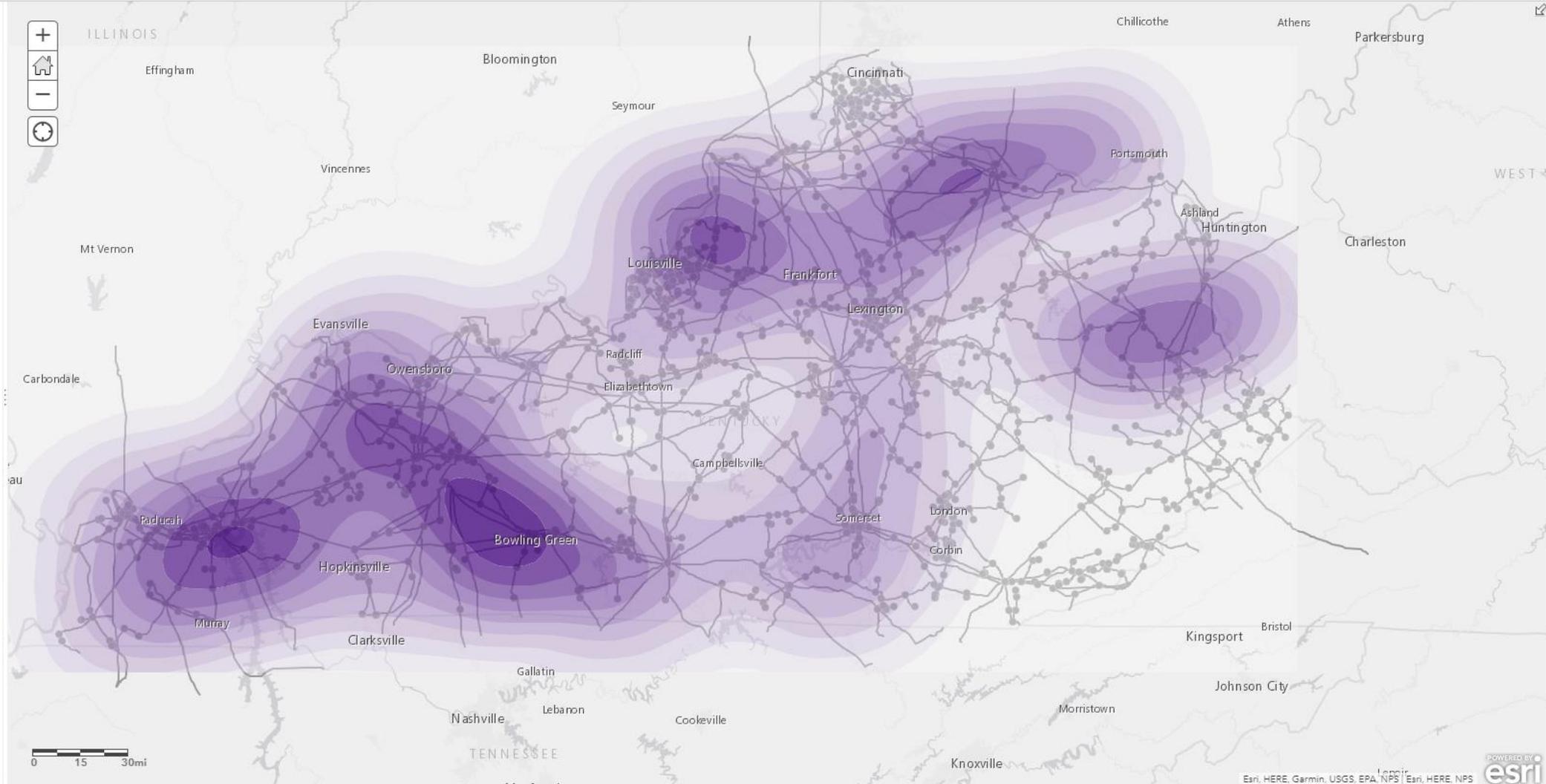
Ky\_Tornado\_tracks\_Density



KY\_Substations



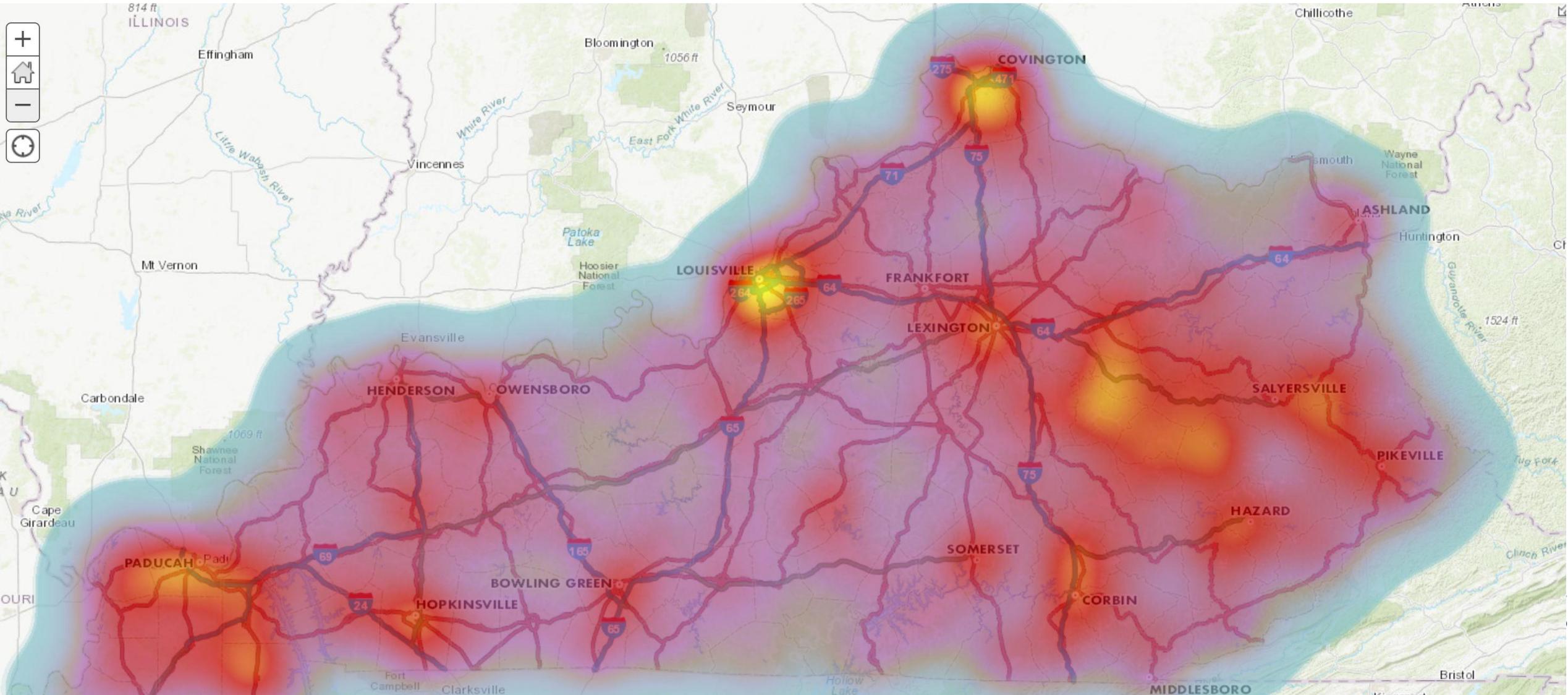
KY\_Transmission



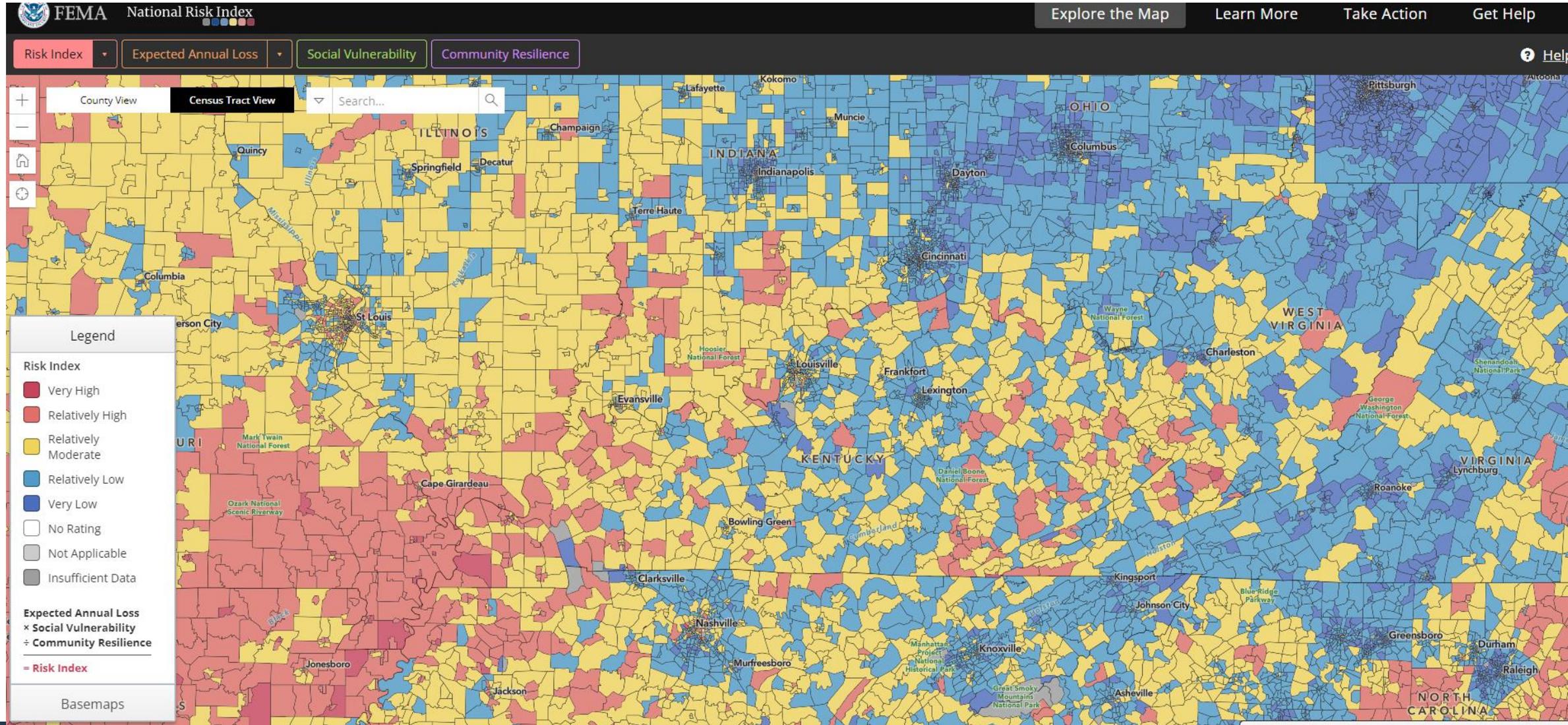
[Trust Center](#) [Contact Esri](#) [Report Abuse](#)

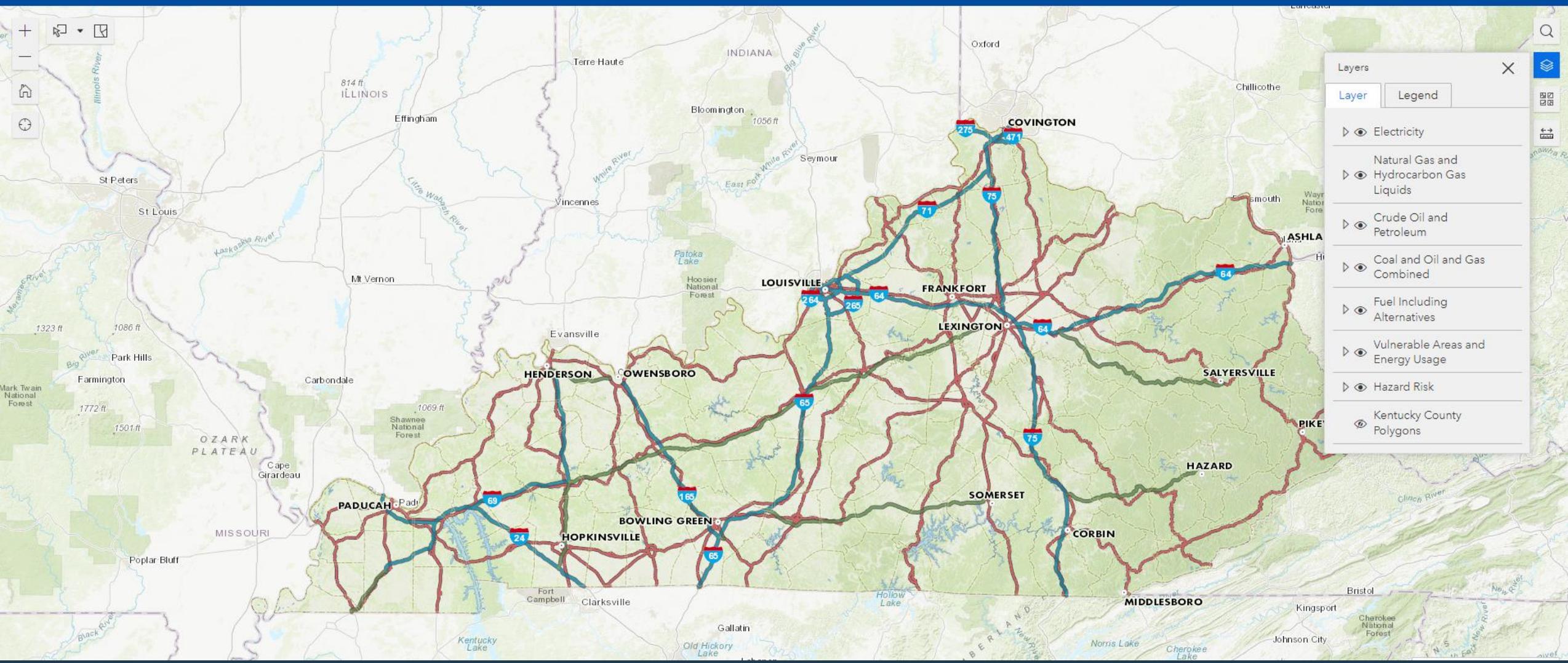
POWERED BY Esri, HERE, Garmin, USGS, EPA, NPS | Esri, HERE, NPS

# Heat Map of NOAA Storm Events 1950-2019



# FEMA National Risk Index





Layers

Layer Legend

- Electricity
- Natural Gas and Hydrocarbon Gas Liquids
- Crude Oil and Petroleum
- Coal and Oil and Gas Combined
- Fuel Including Alternatives
- Vulnerable Areas and Energy Usage
- Hazard Risk
- Kentucky County Polygons

# Other Tools

## Climate Mapping for Resilience and Adaptation

<https://resilience.climate.gov/#assessment-tool%20%3C%20Caution-https://resilience.climate.gov/#assessment-tool%20%3E>

## NOAA Disaster and Risk Mapping

<https://www.ncei.noaa.gov/access/billions/mapping>

## Summary Stats

Return billion-dollar weather and climate statistics for an area of interest over a selected period of time.

State:  Begin Year:  End Year:

Billion-dollar events to affect Kentucky from 1980 to 2022 (CPI-Adjusted)

Disaster Type	Events	Events/Year	Percent Frequency	Total Costs	Percent of Total Costs
Drought	10	0.2	12.8%	\$5.0B-\$10.0B	32.2%
Flooding	4	0.1	5.1%	\$500M-\$1.0B	3.9%
Freeze	3	0.1	3.8%	\$100M-\$250M	1.0%
Severe Storm	45	1.0	57.7%	\$10.0B-\$20.0B	51.4%
Tropical Cyclone	4	0.1	5.1%	\$1.0B-\$2.0B	5.4%
Wildfire	--	--	--	--	--
Winter Storm	12	0.3	15.4%	\$1.0B-\$2.0B	6.1%
<b>All Disasters</b>	<b>78</b>	<b>1.8</b>	<b>100.0%</b>	<b>\$20.0B-\$50.0B</b>	<b>100.0%</b>

<sup>1</sup>Deaths associated with drought are the result of heat waves. (Not all droughts are accompanied by extreme heat waves.)  
Flooding events (river basin or urban flooding from excessive rainfall) are separate from inland flood damage caused by tropical cyclone events.  
The confidence interval (CI) probabilities (75%, 90% and 95%) represent the uncertainty associated with the disaster cost estimates. Monte Carlo simulations were used to produce upper and lower bounds at these confidence levels (Smith and Matthews, 2015).

Select Time Period Comparisons of Kentucky Billion-Dollar Disaster Statistics (CPI-Adjusted)

Time Period	Billion-Dollar Disasters	Events/Year	Cost	Percent of Total Cost
1980s (1980-1989)	9	0.9	\$2.0B-\$5.0B	19.4%
1990s (1990-1999)	11	1.1	\$1.0B-\$2.0B	8.1%
2000s (2000-2009)	21	2.1	\$5.0B-\$10.0B	25.3%
2010s (2010-2019)	24	2.4	\$5.0B-\$10.0B	27.8%
Last 5 Years (2018-2022)	15	3.0	\$2.0B-\$5.0B	20.8%
Last 3 Years (2020-2022)	13	4.3	\$2.0B-\$5.0B	19.4%
Last Year (2022)	5	5.0	\$1.0B-\$2.0B	4.8%
<b>All Years (1980-2022)</b>	<b>78</b>	<b>1.8</b>	<b>\$20.0B-\$50.0B</b>	<b>100.0%</b>