Energy Emergency and Preparedness Data:
Frequently Asked Questions (FAQs) and Quick Guidance on Geographic Information Systems

NASEO
National Association of State Energy Officials

NARUC
National Association of Regulatory Utility Commissioners

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State Energy Offices and Public Utility Commissions rely on timely, accurate, and actionable information to perform their energy emergency response duties and execute their roles as state energy security planners. In support of this need, the National Association of State Energy Officials (NASEO) and the National Association of Regulatory Utility Commissions (NARUC) hosted an Energy Security and Data Analysis Workshop in Washington, DC to identify energy security response and planning data sources; and to share successful methods of data use and integration in state, federal, and private sector tools. Following the workshop, NASEO and NARUC hosted two topical data-centric webinars based on state priorities to identify best practices in Geographic Information Systems (GIS) and Crisis Communications programs leveraged in energy assurance planning and response. The GIS webinar reviewed existing state and federal GIS tools used for energy emergency response and resilience planning, including their current and practical applications, how the tools inform policy or regulatory decisions, why and how the tools were developed and funded, and how they could be replicated. Based on the workshop and webinars, this document summarizes commonly used data sources and includes frequently asked questions which may be used by state energy officials (i.e., consisting of staff from Public Utility Commissions and Governor-designated State Energy Offices) to help guide them in developing or improving their GIS capabilities.

GIS products are extremely useful in communicating the meaning of raw data points to policy and decision makers. By visualizing data and providing geographical context, GIS products can succinctly provide situational awareness in an approachable way and aid planners and decision-makers in determining where resilience investments can be made based on a number of location-based variables. There are a variety of GIS resources, including open-source and restricted options, available to State Energy Officials and Public Utility Commissions for use in energy emergency planning, mitigation, and response. The following frequently asked questions and answers have been developed for organizations interested in leveraging existing resources or developing their own GIS products.

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What federal GIS resources are available for use by State Energy Officials and Public Utility Commissions for energy security and response?

- The **U.S. Department of Energy's (DOE)** EAGLE-I system is available to state officials involved in energy emergency preparedness and response. It is an interactive GIS resource that allows users to view and map the nation's energy infrastructure and obtain near real-time informational updates concerning the electric, petroleum and natural gas sectors within one platform. Access to this tool is limited to DOE-approved accounts. State Energy Officials and Public Utility Commission staff can request an account here EAGLE-I™ (doe.gov).
- The **U.S. Department of Homeland Security's (DHS)** Homeland Security Information Network (HSIN) is a trusted network for homeland security mission operations to share sensitive but unclassified information, including energy and other critical GIS data. HSIN membership is the prerequisite for access to the Homeland Infrastructure Foundation-Level Data (HIFLD) Subcommittee, which houses additional licensed and sensitive GIS data and can be requested by verified HSIN members on an as-requested basis. DHS also offers public access of HIFLD Open Data which can be used for preparedness and resilience. For more information on how to request permission to join HSIN, click here.
- The **U.S. Energy Information Administration (EIA)** hosts a number of static and interactive resources through its Energy Atlas, **including** Energy Infrastructure and Resource Maps, which maps energy resources, infrastructure, and assets; and Energy Disruption Maps, which overlay active hazards and various energy infrastructure.

Is it possible for a State ESF-12 responder or Energy Emergency Assurance Coordinator (EEAC) member to request specific satellite imagery, flood imagery, or heat maps with infrastructure overlay from DOE to support their emergency response and recovery?

- **Yes,** in cases where access to energy infrastructure is prevented due to debris, road closures, or other physical impediments (i.e., there is a clear and present need for the visual data), a State Energy Office or Public Utility Commission can request satellite imagery from DOE's Office of Cybersecurity, Energy Security, and Emergency Response (CESER) during an active emergency. States are encouraged to send clear requests to CESER, and are encouraged to contact NASEO or NARUC if they need help facilitating those requests. The more targeted the request, the better. CESER may not be able to fulfill all requests depending on demand.

How can State Energy Officials PUCs register for the U.S. Department of Energy's Pre-Storm Regional Customer Outage Estimate?

- The estimate displays the potential peak number of electrical customer outages predicted by DOE's Argonne National Laboratory. The estimate is for awareness only and based on forecasts from the National Hurricane Center.
- Energy Emergency Assurance Coordinators (EEAC) program members in states that are expected to be impacted by a hurricane or other major weather event will receive these updates along with predictive outage models approximately 72 hours prior to landfall or impact. To register for these updates, State Energy Officials can request an account on ISERnet with this link.

How can a State Energy Office or PUC develop its internal Geographic Information System (GIS) capabilities? What resources exist for State Energy Officials looking to learn more about GIS?

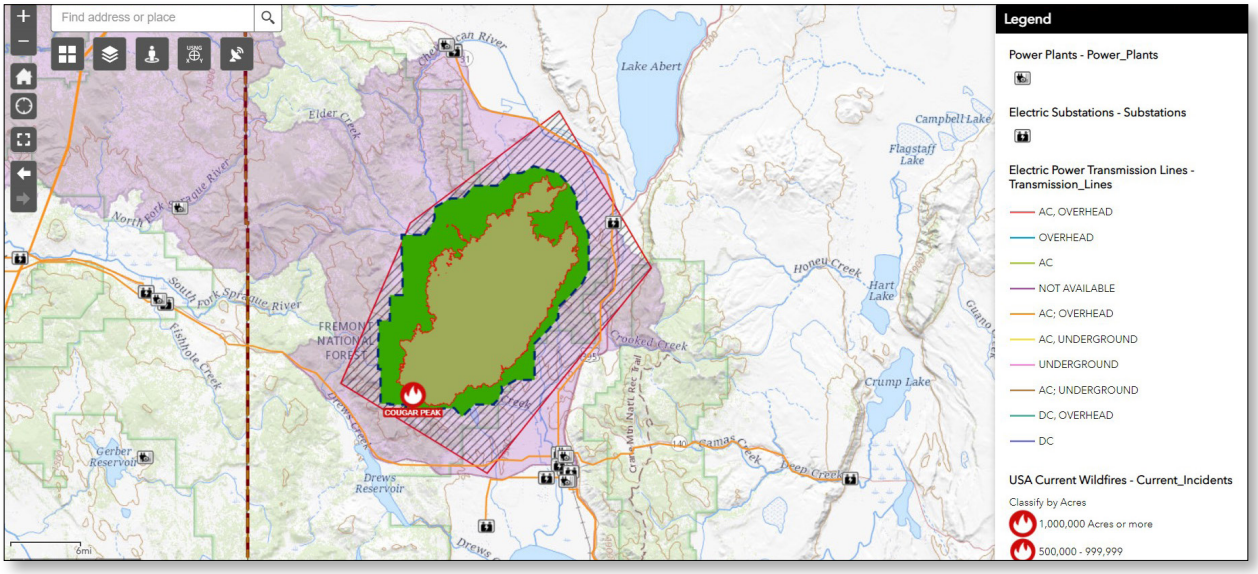
- A State Energy Office or PUC should first determine if other state agencies use GIS platforms or have licenses. Many states share GIS licenses or work collaboratively on GIS projects hosted by state emergency management agencies.
- **If other state agencies do not have a GIS license or enterprise platform that can be shared, a state should develop a multi-agency GIS Strategic Plan.** They may begin by forming a **multi-agency** GIS state government workgroup including Emergency Management, Natural Resources, and Water/wastewater agencies, as they may have existing GIS programs and more experience using them.
- States can also leverage the GIS capabilities at nearby state universities, colleges, and community colleges. Academic institutions often have GIS platforms which might be available to public officials for official or collaborative efforts.

State GIS Spotlights

RAPTR (Real-time Assessment and Planning Tool for Oregon)

- The State of Oregon and its emergency management partners use mapping applications and geographic information systems (GIS) data to "paint the picture" for what is happening in the state and across the world before, during, and after a disaster (see Figure 1).

Figure 1: Real-time Assessment and Planning Tool for Oregon

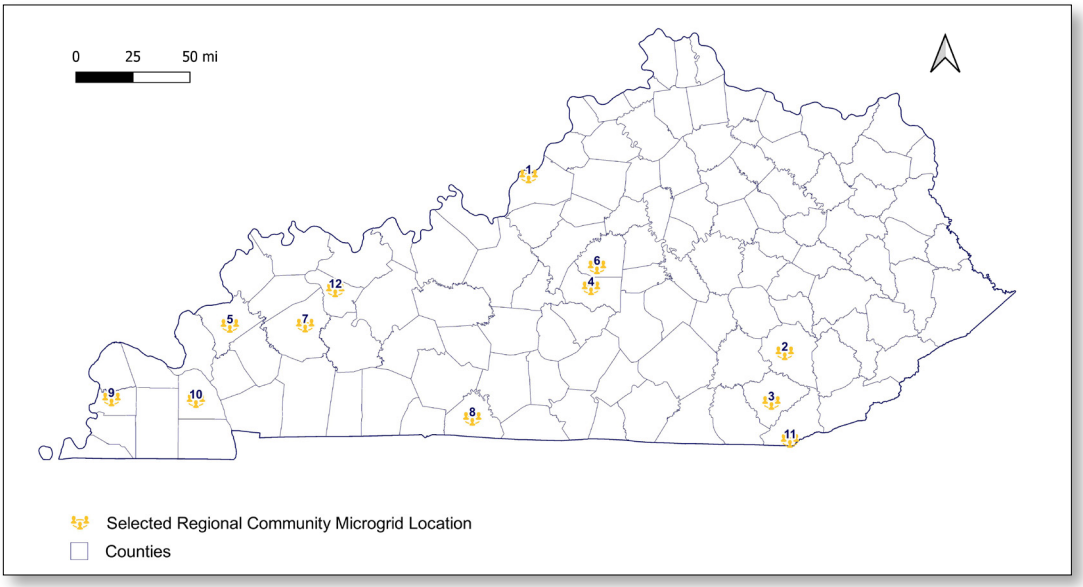


Source: Oregon Office of Emergency Management

State Spotlight: Kentucky Regional Microgrids for Resilience

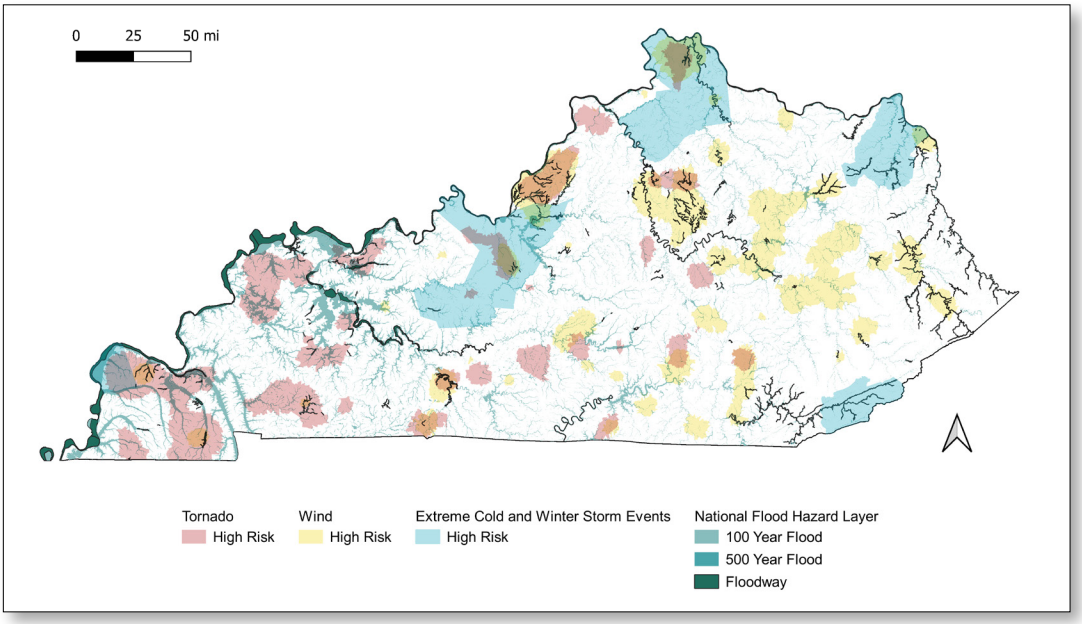
- The Kentucky Energy and Environment Cabinet's Office of Energy Policy (OEP), in partnership with Smart Electric Power Alliance (SEPA), released the "Kentucky Regional Microgrids for Resilience Study." (see Figure 2) The study leveraged GIS to identify potential microgrid deployments for critical facilities to increase the state-wide resilience in Kentucky against natural hazards. (see Figure 3.) This was determined by the overlap of geographic factors such as areas at high risk of hazards and the locations of critical facilities (e.g., hospitals, water treatment plants, grocery stores, etc.).

Figure 2: Selected Regional Community Microgrid Locations



Source: Smart Electric Power Alliance, 2021

Figure 3: Areas at High Risk of Tier 2 Hazards
Tornadoes, Wind, Extreme Cold and Winter Storm Events, and Floods



Source: Smart Electric Power Alliance (2021) based on data provided by NOAA's National Centers for Environmental Information Storm Events Database, HIFLD's Historical Tornado Tracks dataset, and FEMA's National Flood Hazard Layer (2020).

Which skill sets should State Energy Offices and PUCs target, develop, or leverage from other state agencies for internal GIS programs?

- Familiarity with the Esri suite of software.
- GIS **server experience** (if hosting services).
- **Web server experience** (for troubleshooting any issues with self-hosted applications).
- **Program management** and **communication skills** – Effectively translating and communicating data into a visual medium is critical to deliver value.

Which trainings are available to State Energy Offices and PUCs to develop GIS skill sets?

- Interested individuals may enroll in free **FEMA 100 level** Emergency Management Institute (EMI) courses for GIS, simply by entering "GIS" in the National Preparedness Course Catalog search function.
- State officials can utilize Esri's Enterprise Advantage Program (EEAP) and their technical support to help develop GIS skillsets.

What are some funding options for a State Energy Office or a PUC looking to establish or develop its GIS capabilities and in-house mapping resources?

- Depending on which agencies share the GIS program, potential funding options include State Energy Program (SEP) grants, Homeland Security Grant Funding, or Emergency Management Performance Grants. This will vary from state to state.

Which data sources could State Energy Offices and PUCs leverage for their energy mapping?

- Energy Information Administration (EIA) GIS Layers
- Homeland Infrastructure Foundation-Level Data (HIFLD)

Annex A: Data Resources Quick Guide

DATA RESOURCES QUICK GUIDE	
Source	**Description**
Environment for Analysis of Geo-Located Energy Information **(EAGLE-I) (DOE)**	DOE CESER's EAGLE-I™ is an interactive geographic information system (GIS) that allows approved users to view and map the nation's energy infrastructure and obtain near real-time informational updates concerning the electric, petroleum and natural gas sectors.
Electricity Forecasts and Projections **(EIA)**	A collection of generation and electricity usage projections that can be searched by resource type; includes EIA's Short Term Energy Outlook.
State Energy Profiles **(EIA)**	A collection of energy data by state. Data can be viewed and downloaded by state, energy source, or activity and be used to provide internal and external briefings and situation reports. A reliability and resilience topic includes pre-set graphs, but can be customized further.
Energy Infrastructure and Resource Maps **(EIA)**	Maps displaying energy resources, infrastructure, and assets. States may use this data and relevant layers to help their planning efforts to consider geographical factors. States may overlay these maps with historical hazard maps (e.g., flood maps) and determine the geographic relevance and value of interdependent energy infrastructure.
Energy Disruption Maps **(EIA)**	In contract to stagnant maps in EIA's Energy Infrastructure and Resource Maps, the Energy Disruption maps overlay active hazards and various energy infrastructure.
Energy Situational Awareness Reports **(Kentucky)**	Developed by the Kentucky Office of Energy Policy, this dashboard is a virtual compilation of select EIA resources for quick situational awareness regarding pricing around energy resources. The data included reflects national trends and prices.
Gasoline Prices **(GasBuddy)**	Live imagery showing availability and price of retail gasoline nationwide. States can use this resource to determine fuel availability, which can help inform response priorities and support emergency service route planning.
Homeland Security Information Network **(DHS)**	The Department of Homeland Security's official system for trusted sharing of sensitive but unclassified information between federal, state, local, territorial, tribal, international, and private sector partners. States may also download GIS resources, including data layers, into their own GIS systems.
Homeland Infrastructure Foundation Level Data, Open-Source Data **(DHS)**	National foundation-level geospatial data within the open public domain that can be useful to support community preparedness, resiliency, research, and more. The data is available for download and is accessible via web services to support application development and data visualization.
Natural Gas Monthly **(EIA)**	A collection of natural gas data including storage levels, exports, imports, and prices updated on a monthly basis. This resource can help states determine ahead of time if preemptive actions might be needed to mitigate disruptions to already low natural gas stocks.
National Hurricane Center Satellite Imagery **(NOAA)**	Collection of satellite imagery displaying live and recent visuals of storm systems, weather trends, and severe weather events. This can be used by states as triggers to convene emergency preparedness calls and to support preemptive actions based on anticipated impacts.
State and Regional Energy Risk Profiles **(DOE)**	DOE CESER's Energy Risk Profiles examine the relative magnitude of risks at a regional and State level, highlighting energy infrastructure trends and impacts. The profiles present both natural and man-made hazards with the potential to cause disruption to electric, petroleum, and natural gas infrastructure. They can help raise states' awareness of energy sector risks and help them prepare for disruptions.

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