

Addressing Landslides in Kentucky: A State Perspective

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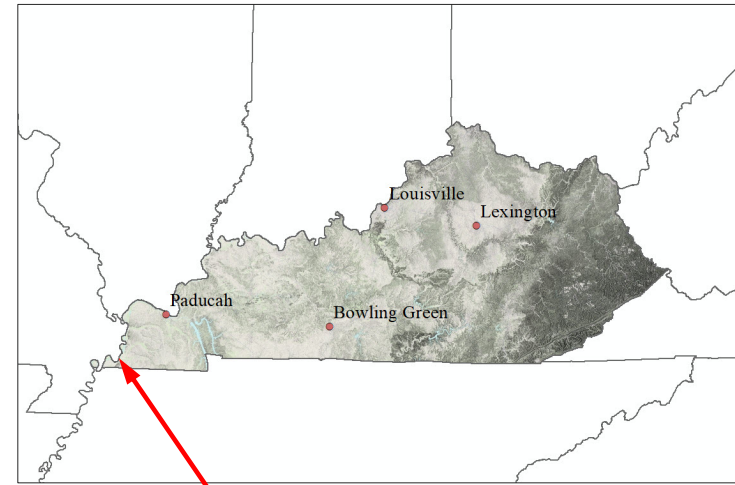
Hazards Caucus Alliance Congressional Landslides Briefing

June 7, 2019

Washington, D.C. – Dirksen Senate Office Building

Impact

- KY Emergency Management and FEMA spent ~\$11.2 million on landslide mitigation projects for homes from 2003 to 2015
- KY Transportation Cabinet incurs costs of ~\$20 million/yr for landslides that damage roads
- Annual landslide **direct costs** = ~\$10-20 m (rivals flood costs!!)
- Cincinnati and northern KY combine to have one of highest cost per capita due to landslide damage
- Record 4 disaster declarations in 2015, 2 in 2018, 1 in 2019



Fulton Co.

Debris flow

Floyd Co., KY



Abandoned road in Lewis Co., KY.



Damaged home, Boyd Co., KY



Challenges

- No systematic catalog of occurrence
 - Damage/cost is poorly documented
 - Part of another event; flood or earthquake
 - Generally not covered by insurance plans
- Hazard assessment is difficult
 - No standard model
 - Risk and loss reduction strategies depend on site variability and slide behavior
- Various roles of federal, state, local officials to address mitigation

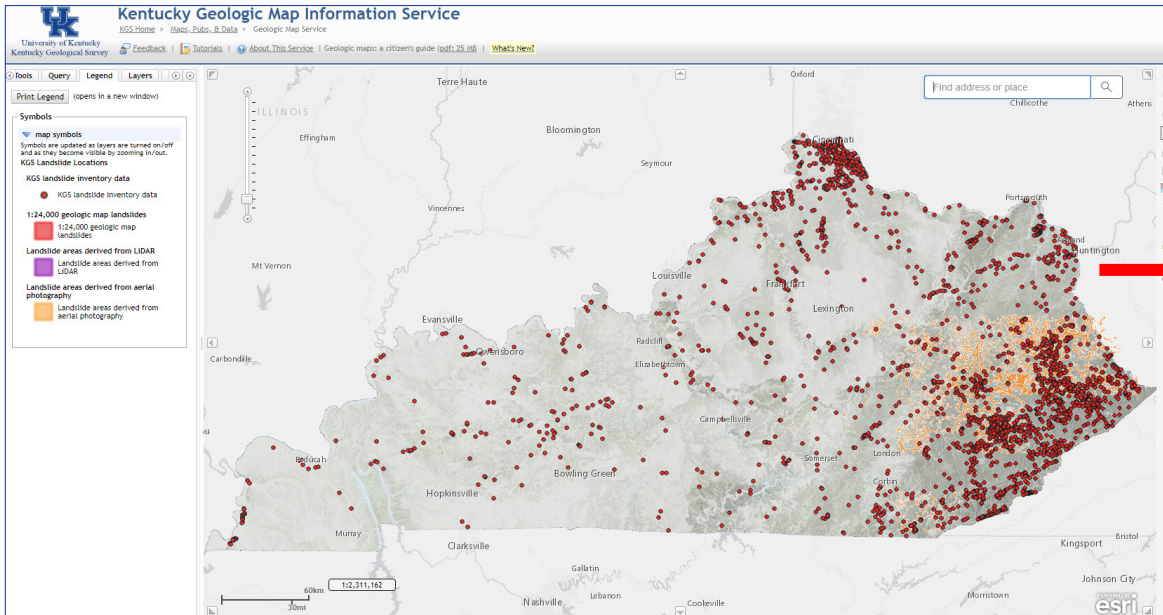


Perry Co., KY

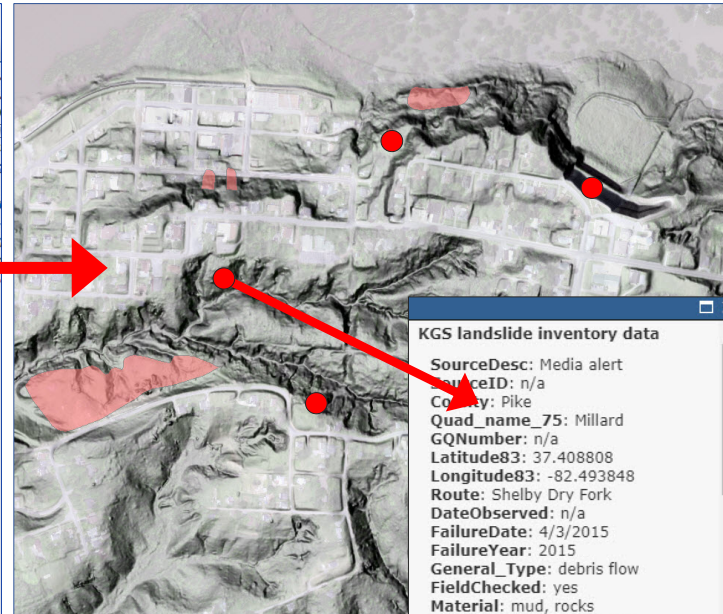


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Landslide Inventory



Interactive map service

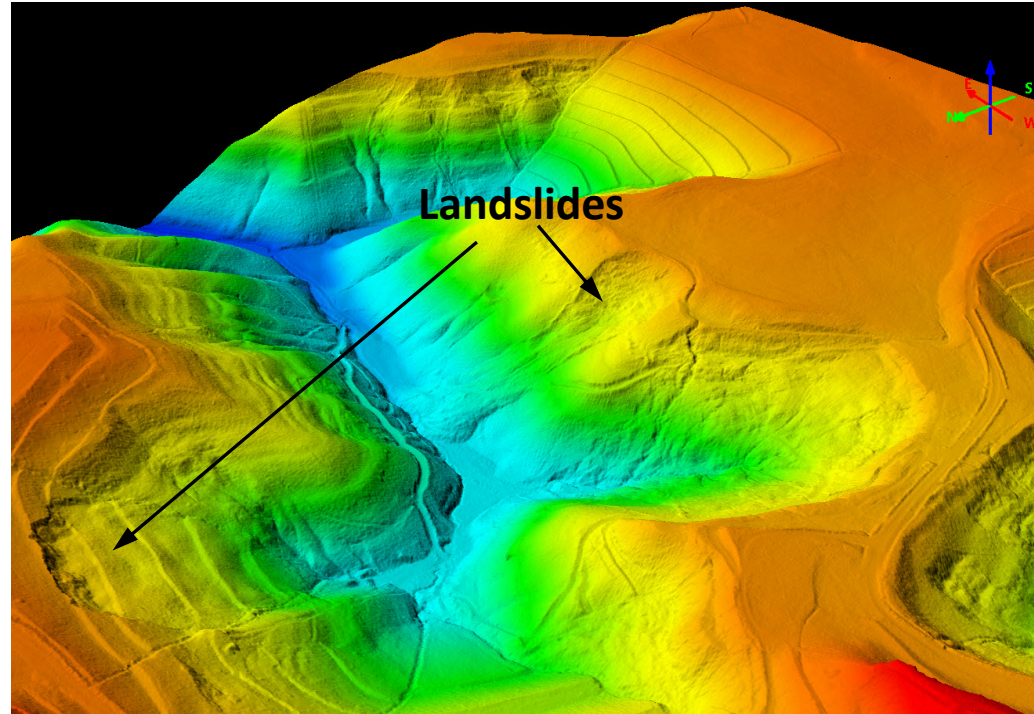


Zoomed in

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Light-Detection and Ranging (LiDAR!)

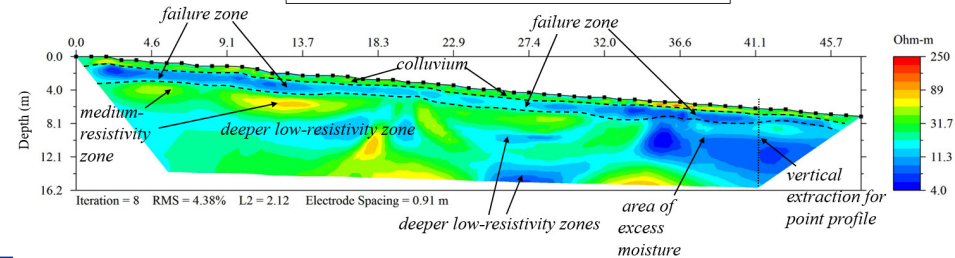
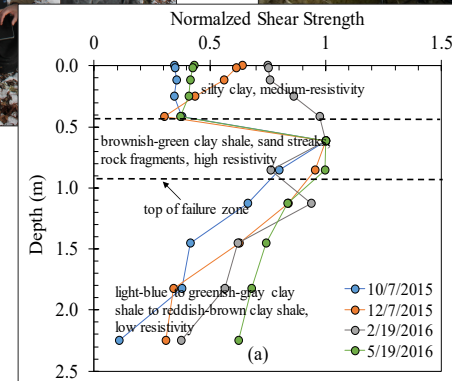
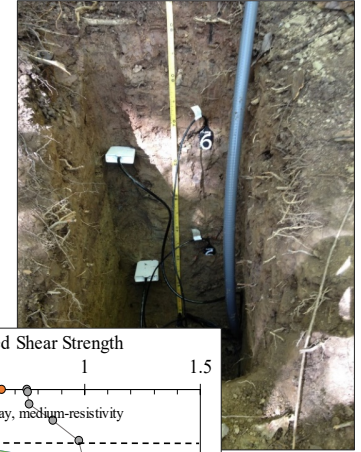
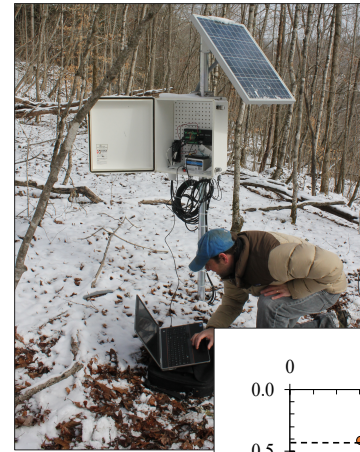
- Mapping landslides
- Susceptibility modeling
- Change detection



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Site-specific Investigations

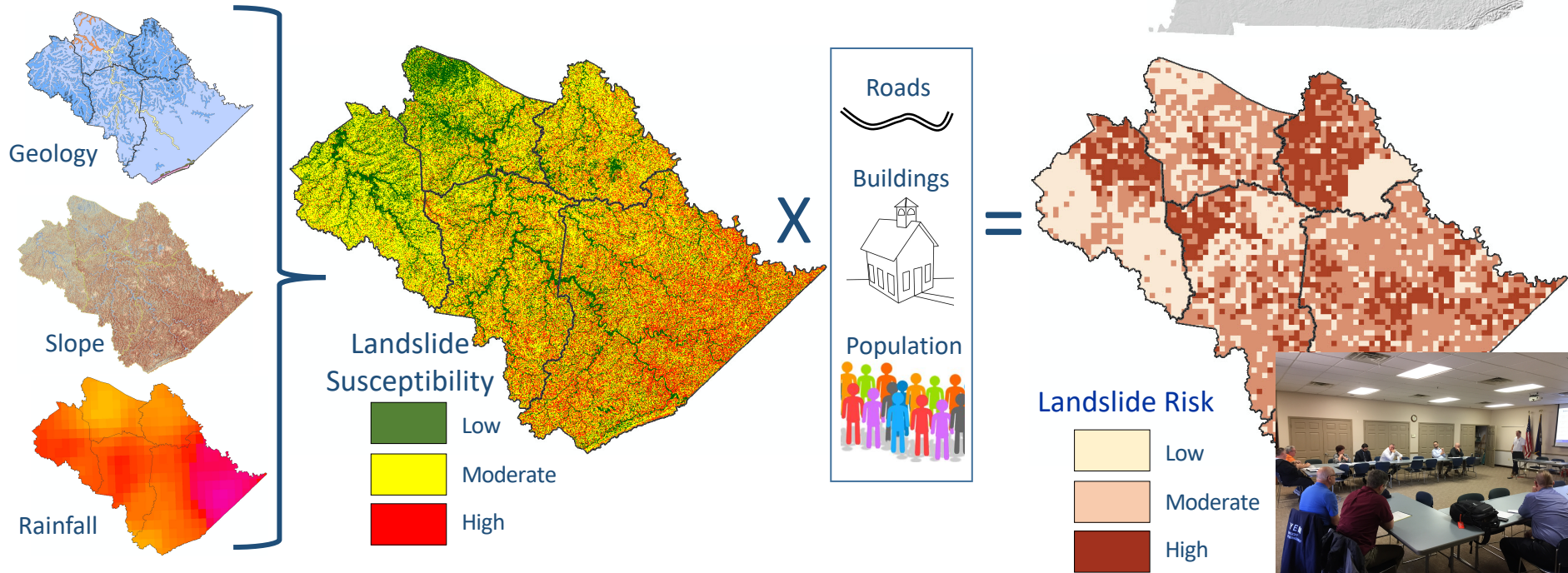
- Soil moisture
- Rainfall
- Geotechnical soil properties
- Movement
- Geophysics



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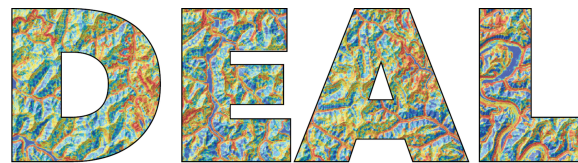
Landslide Hazard and Risk Assessment

FEMA Pre-Disaster Mitigation Grant to focus on landslide susceptibility and risk assessment, designed to reduce the risk to individuals and property

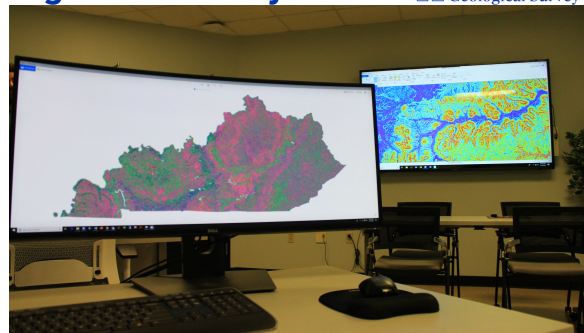


Why Is the State Role So Important?

- Landslides occurrence is not just in the western U.S.
- U.S. Geological Survey cannot be everywhere, often have different goals
- State experts can establish relationships with stakeholders, demonstrate technical scientific capability to be a primary source of geologic information

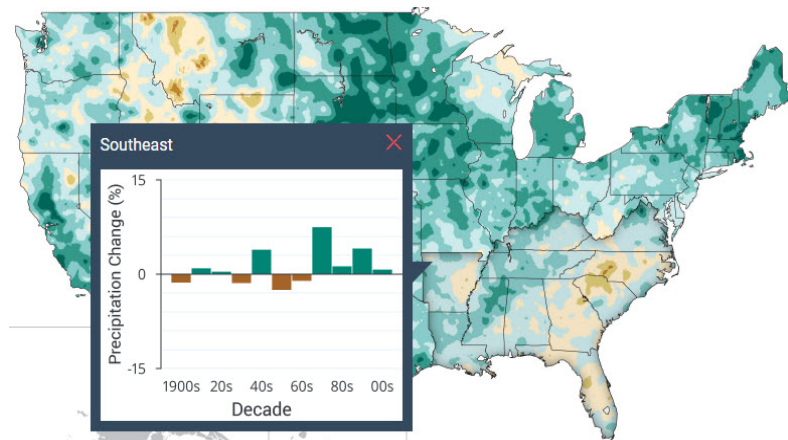


Digital Earth Analysis Lab  Kentucky Geological Survey



Summary

- Landslides in KY damage roadways, infrastructure, and homes costing \$10-20 million/year
- KGS conducts research investigating landslide susceptibility and risk, and is a credible resource for geologic hazards
- Further collaboration with communities and government agencies that support hazard assessment will greatly reduce risk, lower costs, and improve general landslide awareness



Annual precipitation changes for 1991-2012 compared to 1900-1960

National Climate Assessment 2014