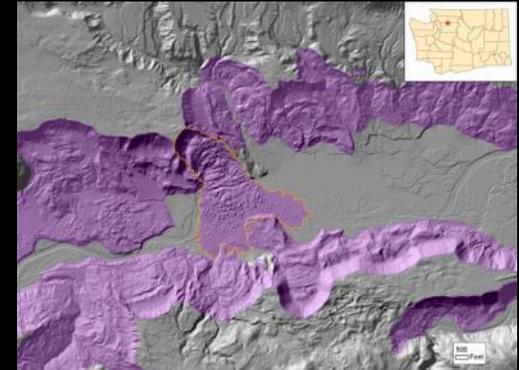


# SR530 LANDSLIDE IN WASHINGTON STATE AND THE NEED FOR A NATIONAL LANDSLIDE PROGRAM

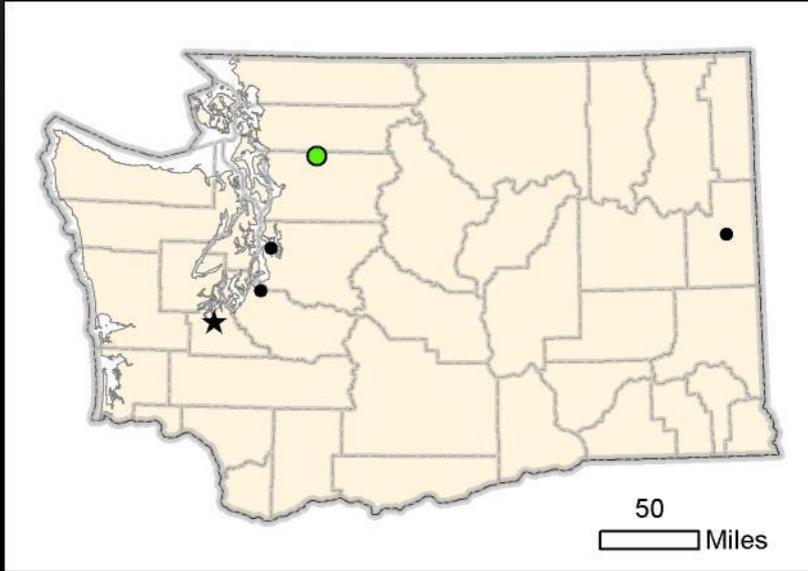
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David K. Norman, LHG, LEG  
State Geologist

# SR530 Landslide, Snohomish County, WA



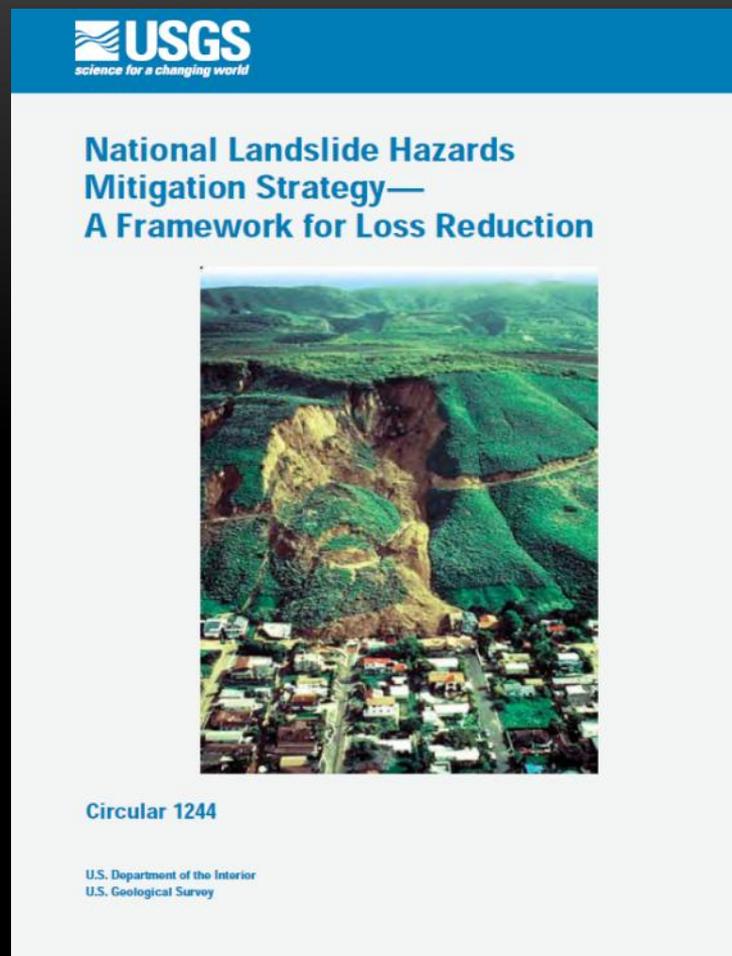
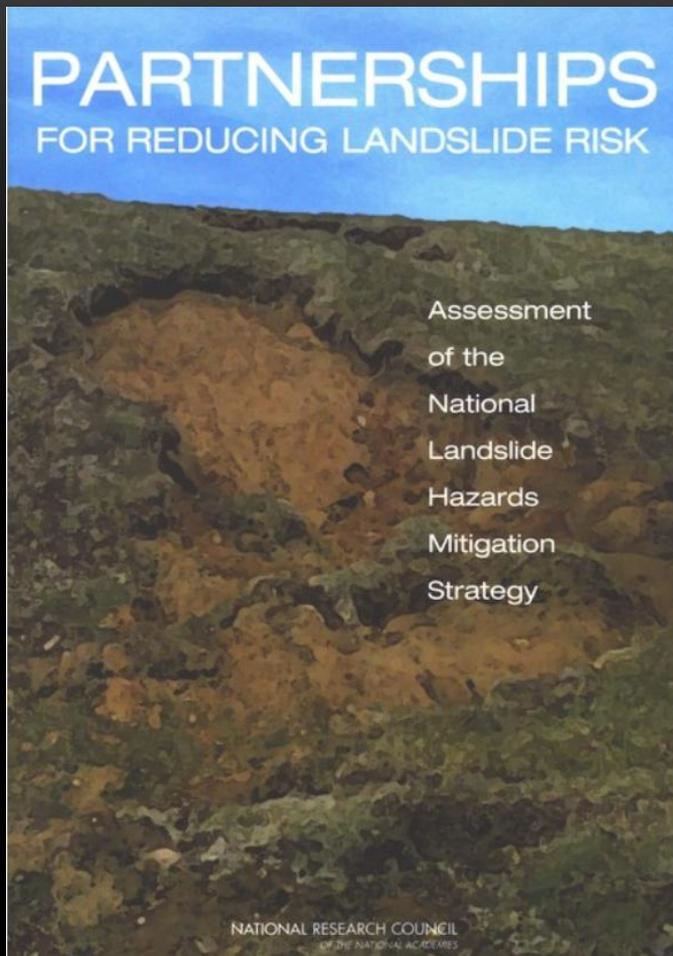
- March 22, 2014 at 10:37 am
- Speed estimated at 60mph
- < 1 minute to cross valley
- 10 million cubic yards
- 42 people killed, 1 person missing
- Landslide area: 286 acres, 0.45 mi<sup>2</sup>
- Recovery mostly in 100 acre area
- Flooded 0.6 mi<sup>2</sup>
- More than 1100 personnel working at one time
- 28 geologists - County, state, and federal
- Response was for over 70 days
- Cost is >\$120 million so far. Does not include costs from DOT and EMD
- To date 38 lawsuits have been filed against the state and county

# OVERVIEW OF THE SR530 LANDSLIDE AND OUR CONCERNS AS WE FLEW INTO THE LANDSLIDE AREA

- Potential instability of the March 22 landslide and the safety implications for the first responders
- What was happening with the landslide dammed river upstream and the river downstream
- Are other landslides in the valley also going to fail soon?



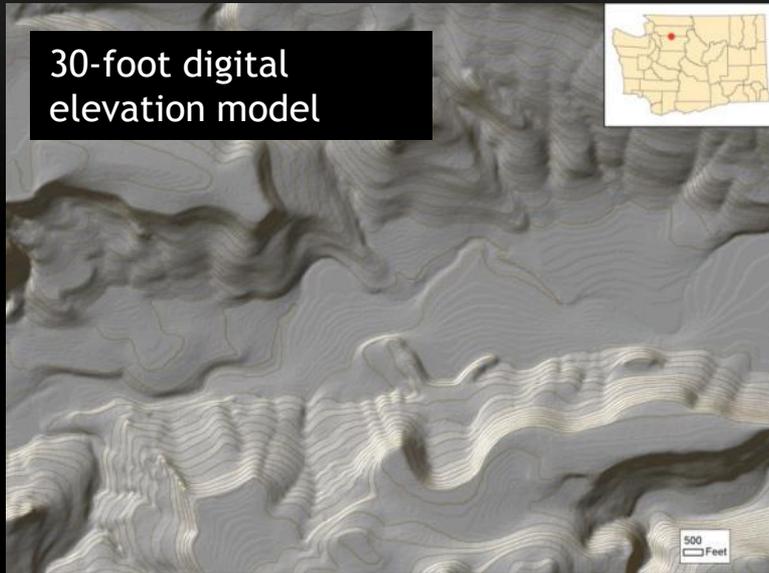




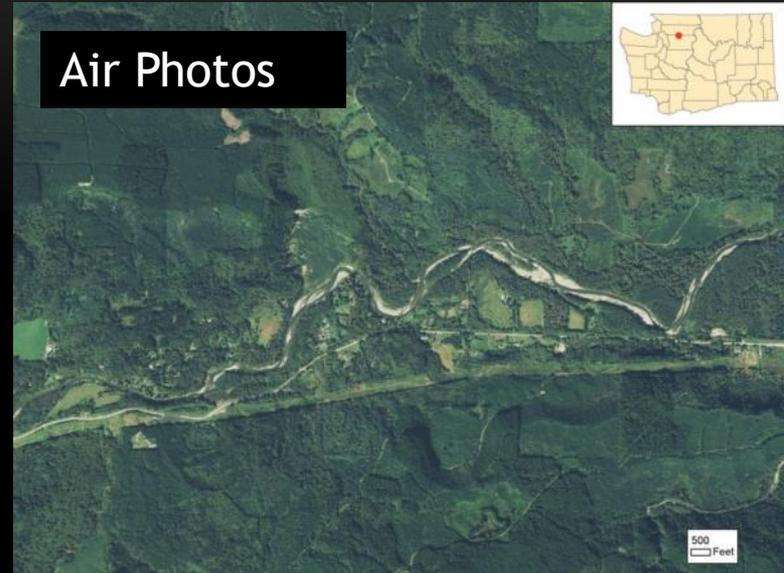
- USGS (2003) and National Research Council (2004) Recommendations for a National Landslide Mitigation Strategy can save lives and reduce economic impacts
- State Geological Surveys roles
- High resolution Lidar is a critical tool that is needed

# LANDSLIDE MAPPING WITHOUT LIDAR

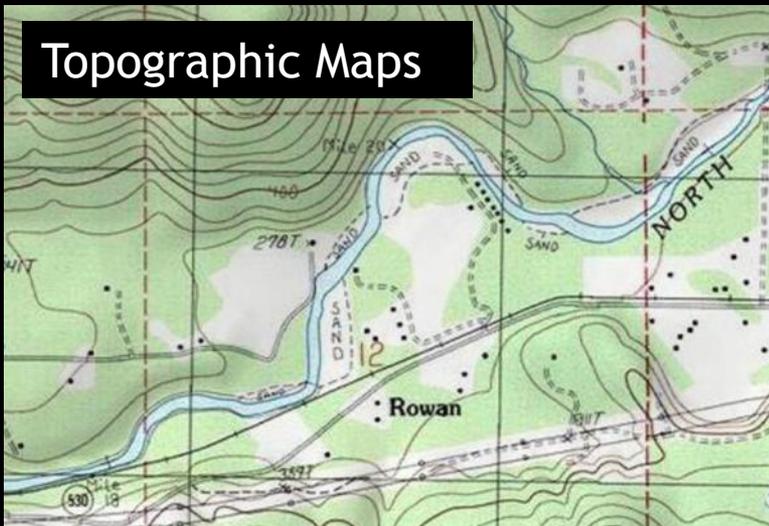
30-foot digital elevation model



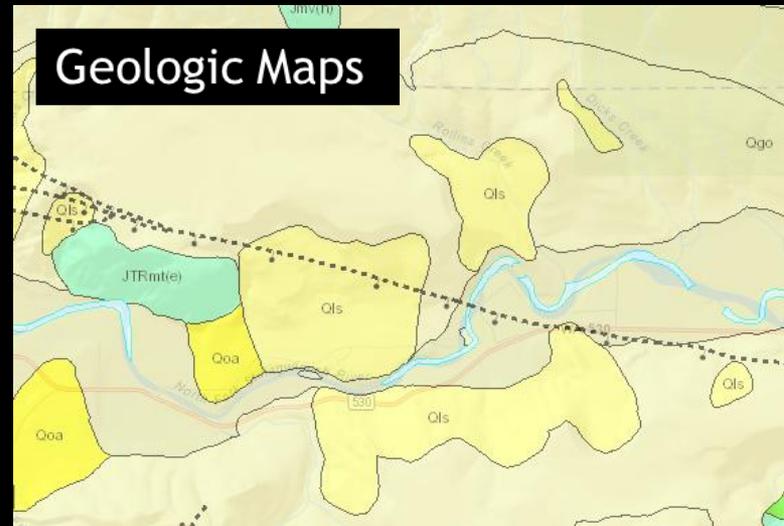
Air Photos



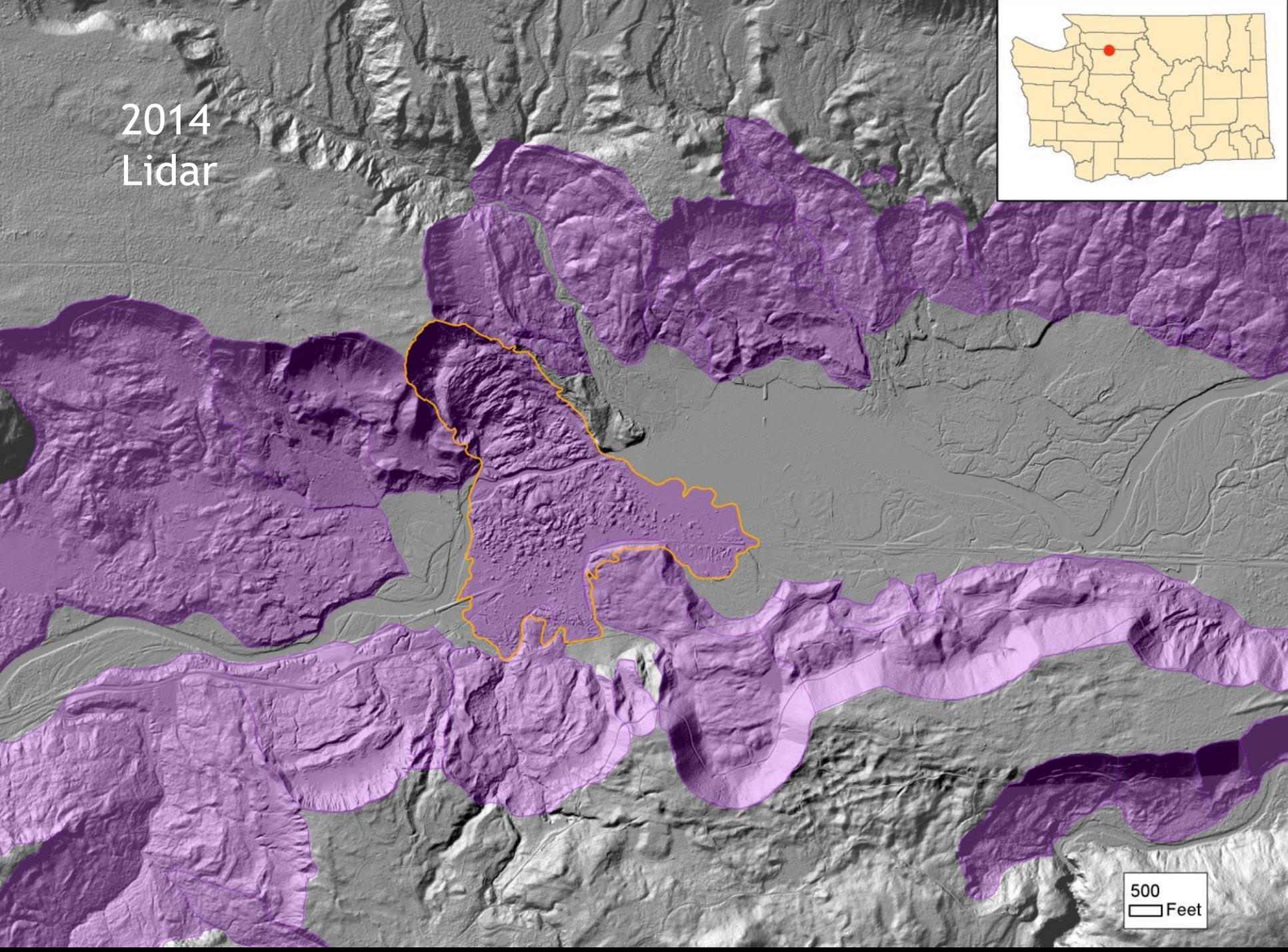
Topographic Maps



Geologic Maps



2014  
Lidar



500  
Feet

# GAPS

- Currently there is no national coordination or standards on landslide hazard mapping among private sector or federal, state, and local government agencies
- There is no cooperative landslide program between USGS or other federal agencies and the State Geological Surveys as recommended in the 2004 National Research Council report - much of the country remains insufficiently mapped
- High resolution Lidar data is absent in many key areas of the country and Lidar is a fundamental tool for accurate landslide hazard mapping
- Critical information regarding landslides hazards must be communicated to local government and the public and be part of a comprehensive solution