



Local Landslide Assessment : The Hennepin County (MN) experience

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Hennepin County Emergency Management

AGI Policy and Critical Issues Webinar: Identifying and Reducing Landslide Risk





2014 – **3 homes evacuated**, with one condemned and razed in Eden Prairie. (over \$1 million)



2013 – **2 children killed** and 2 injured when their school’s fossil field trip was hit by a landslide in Saint Paul. (over \$2 million)



2014 – Large Minneapolis hospital nearly shut down when landslide threatens electric and oxygen systems. Leads to **Federal declaration** in Hennepin. (over \$8 million and 2.5 years to stabilize)



This is the Hennepin County experience...

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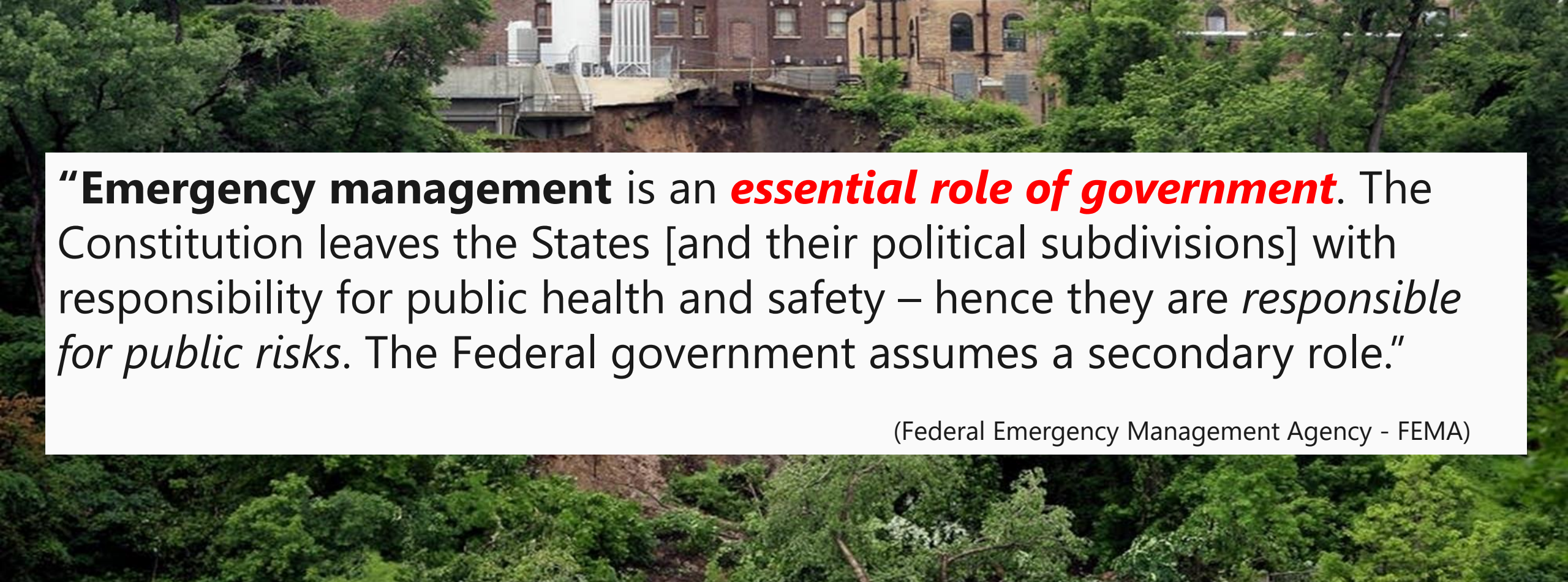


An Emergency Manager is a key player for an assessment

- It is important for the local emergency managers recognize the landslide hazards in their jurisdiction.
- Local emergency managers write the jurisdiction's emergency plans and coordinate with all organizations having a response or recovery role.
- Grants funds used to mitigate and prepare for disasters are usually obtained and managed by the local emergency manager.

Local Emergency Manager

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“**Emergency management** is an ***essential role of government***. The Constitution leaves the States [and their political subdivisions] with responsibility for public health and safety – hence they are *responsible for public risks*. The Federal government assumes a secondary role.”


(Federal Emergency Management Agency - FEMA)

All Disasters Are Local

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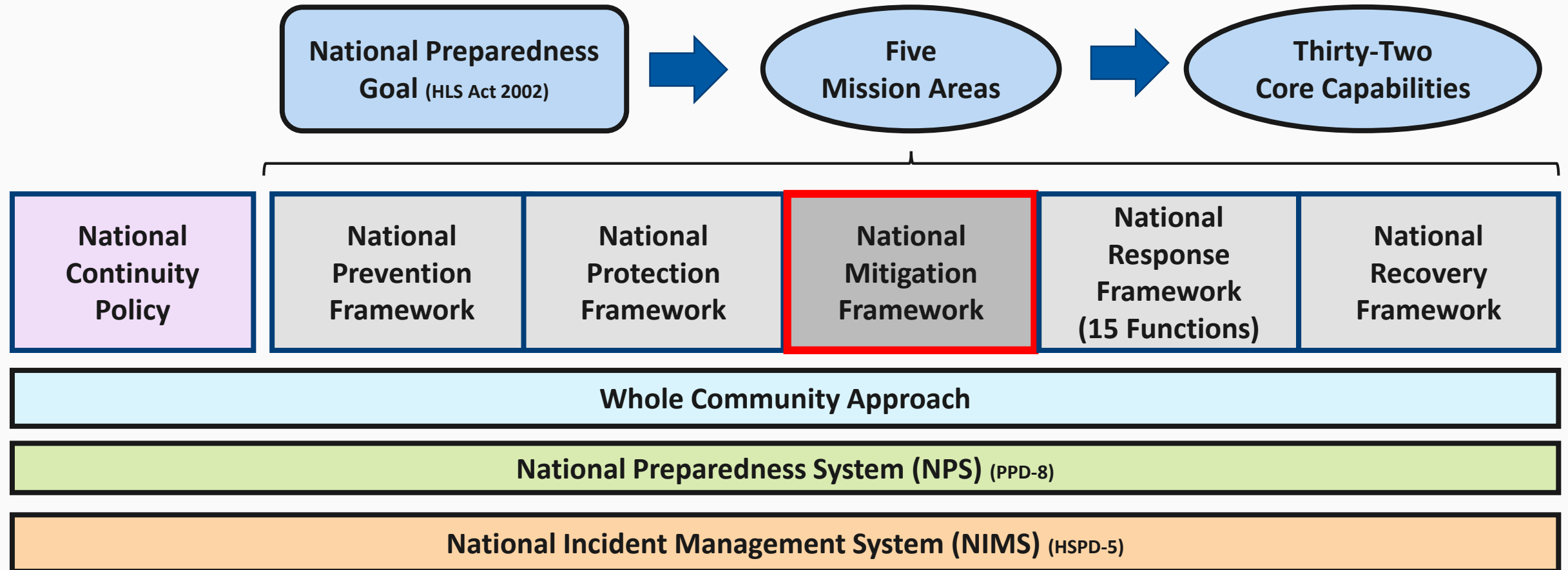
“**Emergency management** is a ***jurisdiction-wide system*** that provides for management and coordination of prevention, mitigation, preparation, response and recovery activities for all hazards. The system encompasses all organizations, agencies, departments and individuals having responsibilities for these activities.”

(Emergency Management Accreditation Program - EMAP)

Emergency Management

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Emergency Management frameworks and systems



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**Incident
Command System
(ICS) (OSHA)**



Threats and Hazards Identification

Identify the hazards that occur in the geographic area and determine their frequency and magnitude;

Incorporate hazard assessment into a planning processes so as to clearly understand the needs of a community.

This capability involves the continual collection of timely and accurate data – including the future impacts of climate change.

National Mitigation Framework, 2nd ed., page 17

National Mitigation Framework

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Grand Challenges for Disaster Reduction
National Science and Technology Council (2005)

- **Provide hazard and disaster information where and when it is needed.**
- **Understand the processes that produce hazards.**
- **Promote risk-wise behavior**
- **Develop hazard mitigation strategies and technologies.**

Grand Challenges for Disaster Reduction

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Hennepin *West* Mesonet: *Continuous hazard monitoring for public safety*



Provide hazard and disaster information where and when needed

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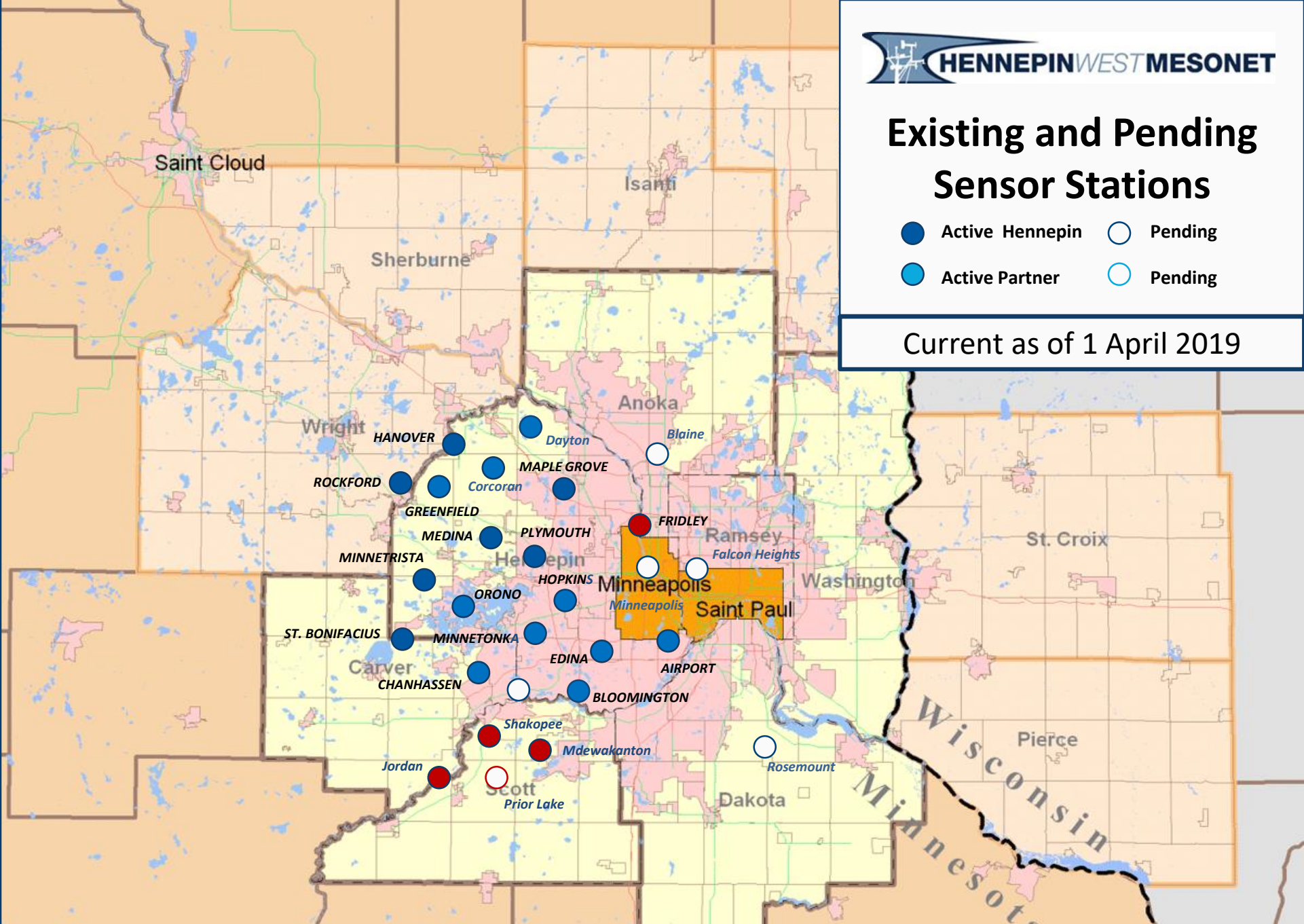
<http://hennepinwestmesonet.org>



Existing and Pending Sensor Stations

- Active Hennepin
- Pending
- Active Partner
- Pending

Current as of 1 April 2019



Understand the processes that produce hazards

Hennepin County Landslide Assessment Group



HENNEPIN COUNTY

- Emergency Management
- Regional Rail Authority
- Geographic Information Systems



MN DEPARTMENT OF NATURAL RESOURCES

Water Resources



US GEOLOGICAL SURVEY



UNIVERSITY OF MINNESOTA

- Earth Sciences Department
- Minnesota Geological Survey



FRESHWATER SOCIETY

and
WATERSHED
DISTRICTS



NATIONAL WEATHER SERVICE

Chanhassen Forecast Office

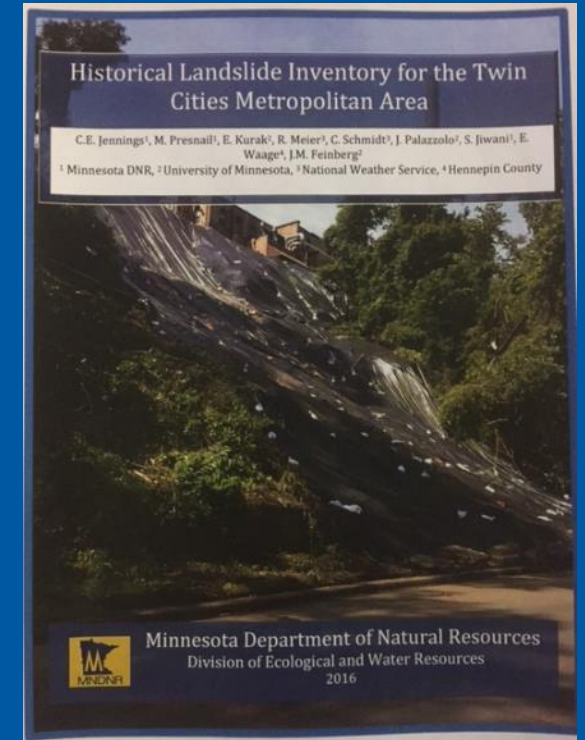
Historical Archives Search



1894 Stillwater Landslide



1984 Eden Prairie Landslide



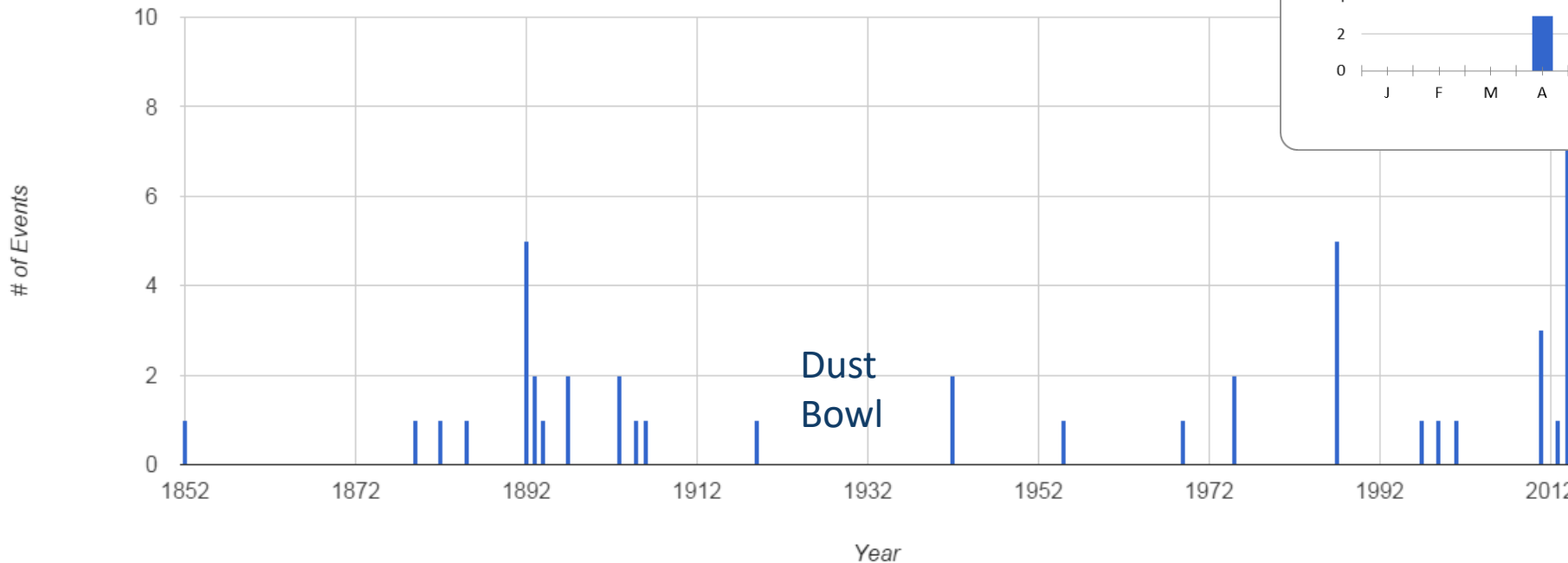
MN Department
of Natural Resources
Historic Landslide
Inventory for the
Twin Cities Metropolitan
Area. (2016)

51 documented Twin Cities landslides/mudslides found in historic sources.

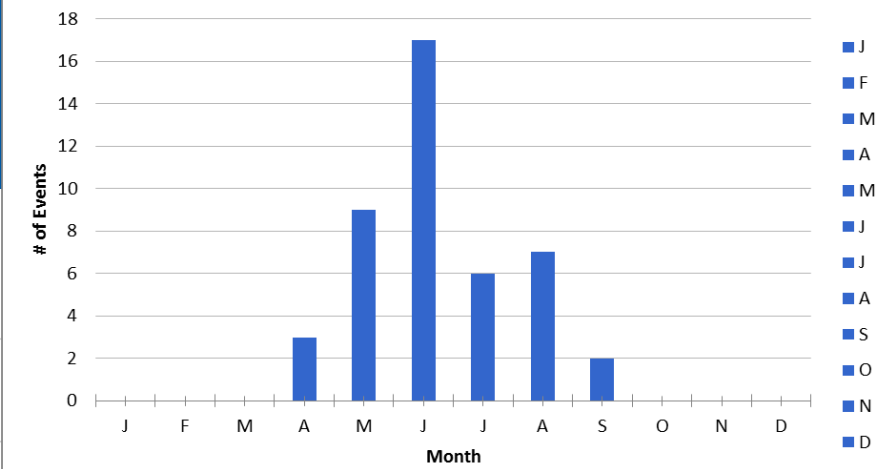
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Climate & Seasonal Correlation

Year Versus Landslide Events



Landslides by Month



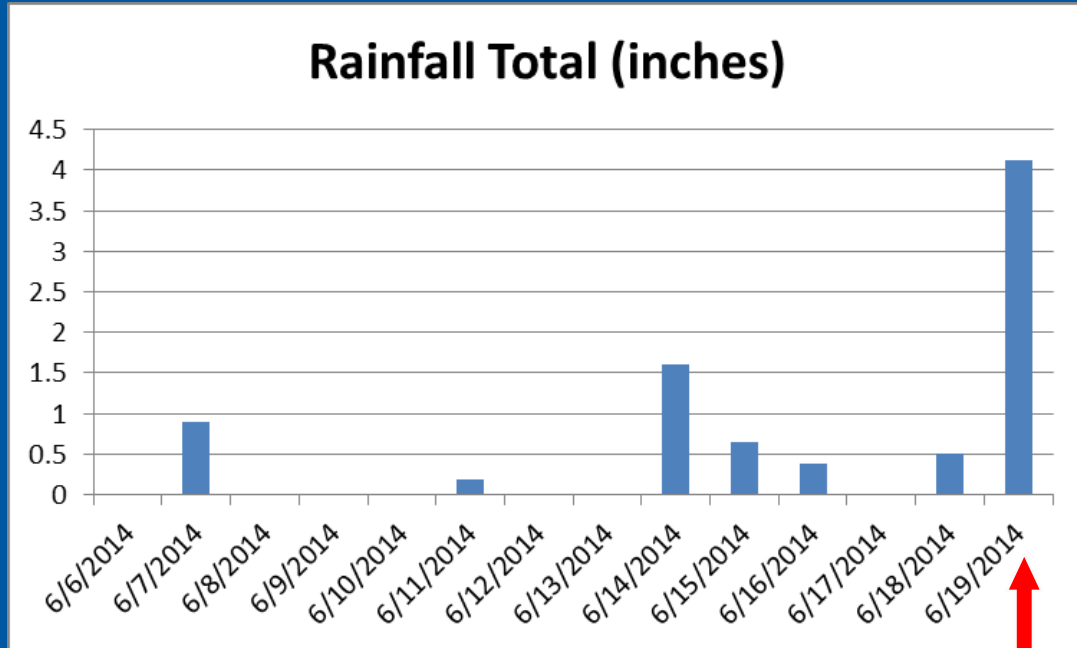
The Twin Cities' "landslide season" April through September*

*not including falls and topples which are often triggered by freeze-thaw action

Correlation between wet decades and landslides versus dry decades with no slides



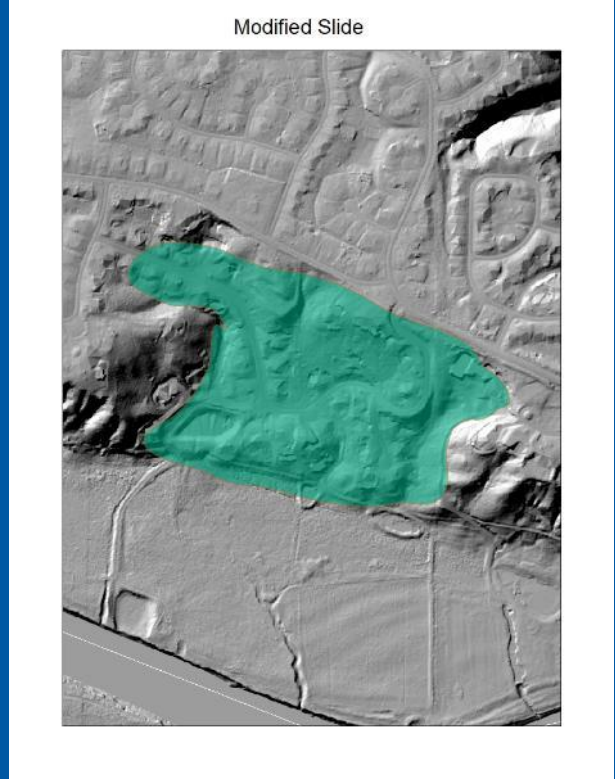
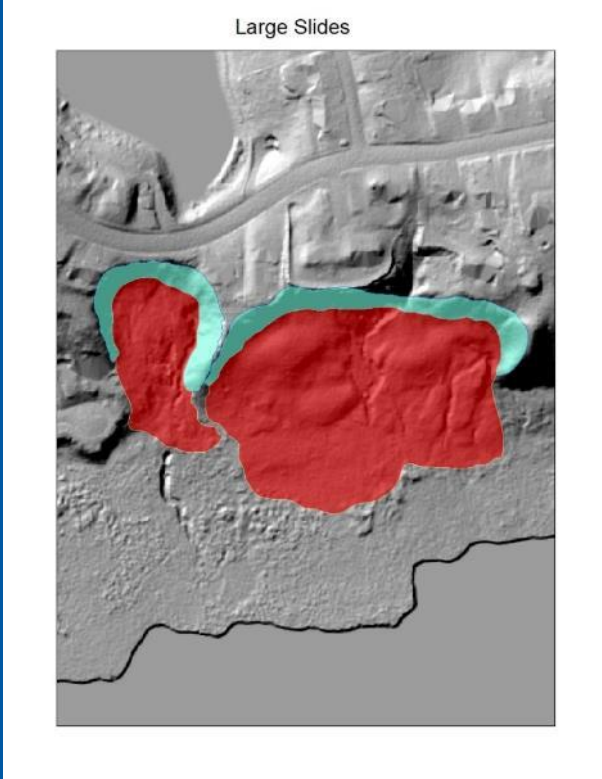
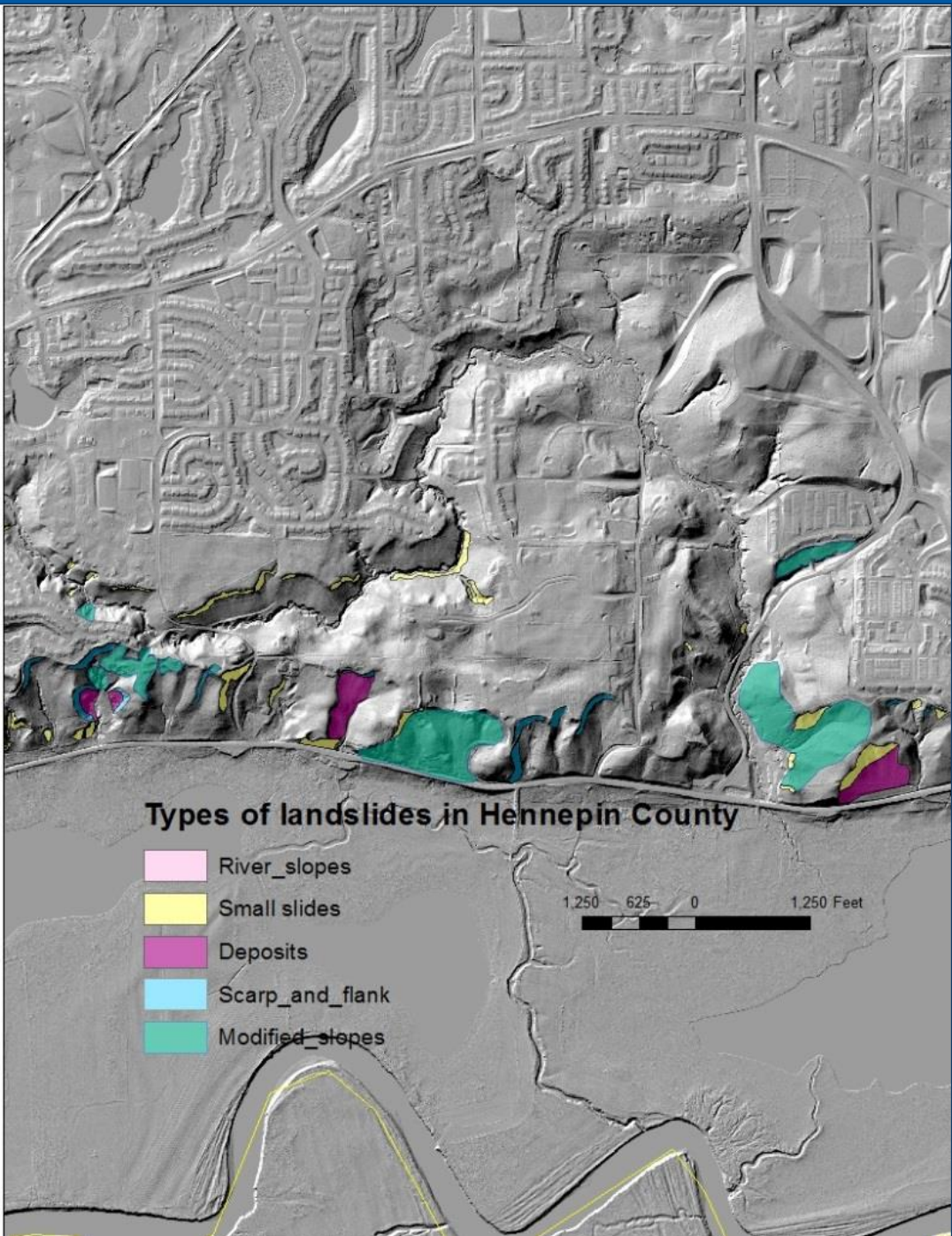
Landslide Weather Correlation



Conditions prior to the June 19, 2014 landslide at Fairview-University Hospital, Minneapolis



LIDAR Landslide



Three areas of landslide activity

1. Mississippi River Gorge
2. Minnesota River Valley and tributaries
3. Glacial deposits

"A **fundamental challenge** for emergency managers is to ***improve the recognition and protective awareness about local hazards*** among government officials and the public. For many people once hazards strike, the unanticipated emergency appears like a surprising 'bolt out-of-the-blue.' In fact, most natural hazard tragedies and losses are foreseeable and some are even preventable after some deliberate investigation."

(Hennepin County Landslide Atlas - HCEM)

Promote Risk-Wise Behavior

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Develop hazard mitigation strategies and technologies

- Land use planning and zoning
- Transportation and infrastructure planning
- Prevention and protection actions
- Education and outreach
- Sample ordinances and codes

Landslide Mitigation Strategies



Prepared for:



FEMA



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Hennepin County
Emergency Management



General funds (local property tax)

Hennepin County Emergency Management
Hennepin County Regional Rail Authority
Watershed District funds

Freshwater Society Geologist
University of Minnesota Geologists

In-kind assistance

Minnesota DNR, National Weather Service, US Geological Survey,
US Natural Resources Conservation Service

Environment and Natural Resources Trust Fund (MN)

“Landslide Hazards and Impacts on Minnesota’s Environment” \$500,000

Hennepin County Assessment Funding

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Hennepin County
Emergency Management



Stafford Disaster Relief & Emergency Assistance Act.

FEMA administered program - *Presidential Disaster Declaration*
Refer to FEMA policy RP9524.2 “Landslides and Slope Failures”

Emergency Watershed Protection (EWP).

USDA (NRCS) administered program.

Emergency Relief (ER) for Federal Aid Highways

USDOT (FHWA) administered program.

Federal Disaster Relief – Response & Recovery

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Hazard Mitigation Grant Program (HMGP).

FEMA Stafford Act program. 15% of the amount provided to states and localities following a major disaster declaration is set aside for the impacted states.

Pre-Disaster Mitigation Grant Program (PDM).

FEMA Stafford Act program. Nationally-competitive grant.

To be considered for funding under HMGP or PDM, a project must conform with the FEMA approved state and locally adopted hazard mitigation plans.

States and tribes are eligible HMGP and PDM grant applicants. Local governments are eligible sub-applicants.

Federal Disaster Mitigation Grants

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QUESTIONS

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Eric Waage
17 April 2019



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