

# Lessons from The Great Vermont Flood of 10-11 July 2023



House Transportation and Environment and Energy Committees : January 3, 2024  
Ben DeJong – Vermont Geological Survey



# Your Vermont Geological Survey



*Ben DeJong, Ph.D.*



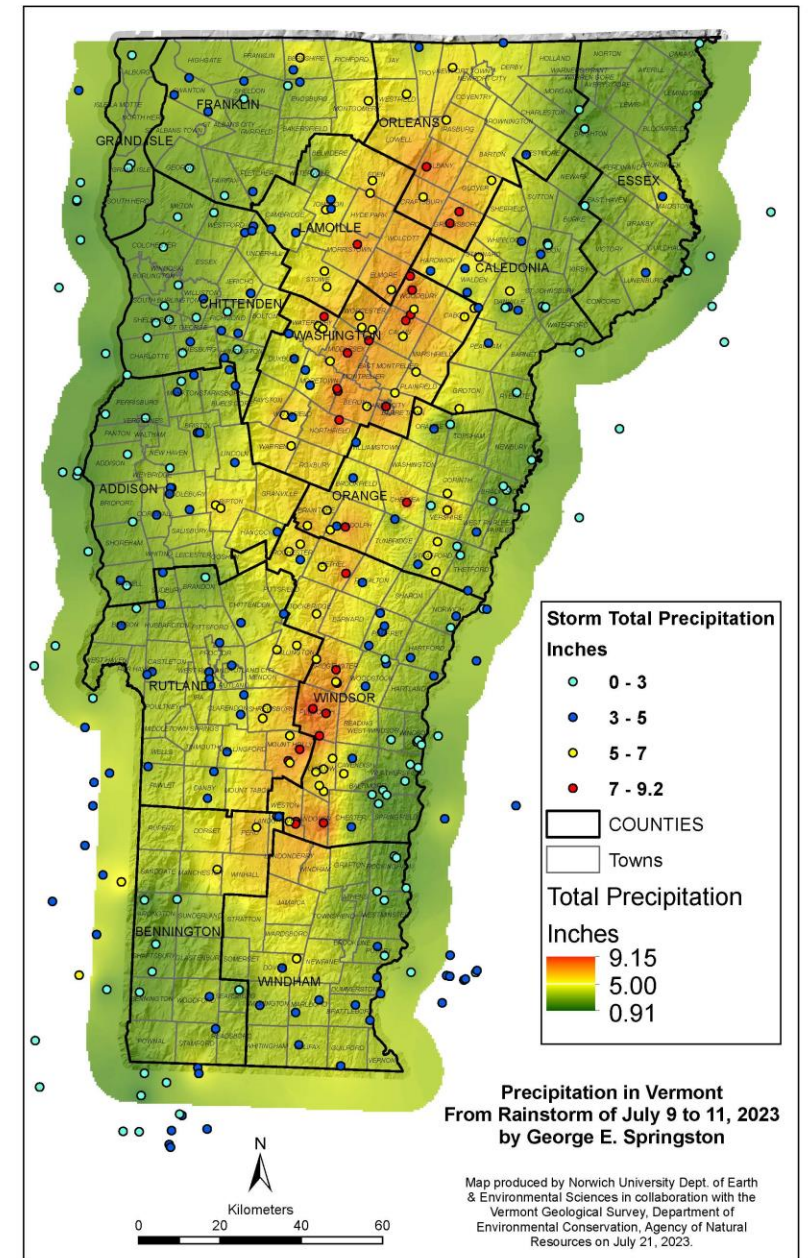
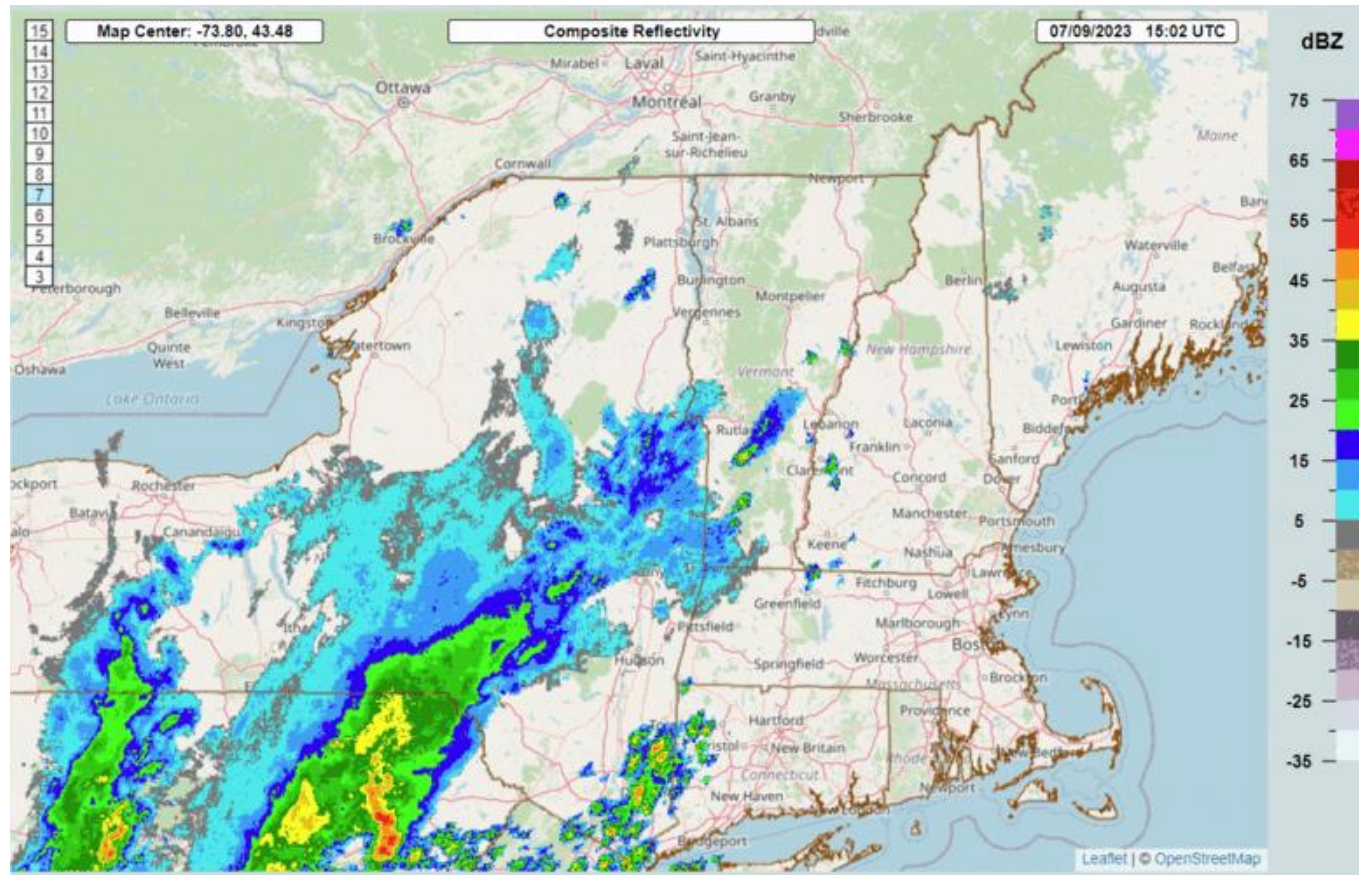
*Jon Kim, Ph.D.*



*Peter Strand, Ph.D.*

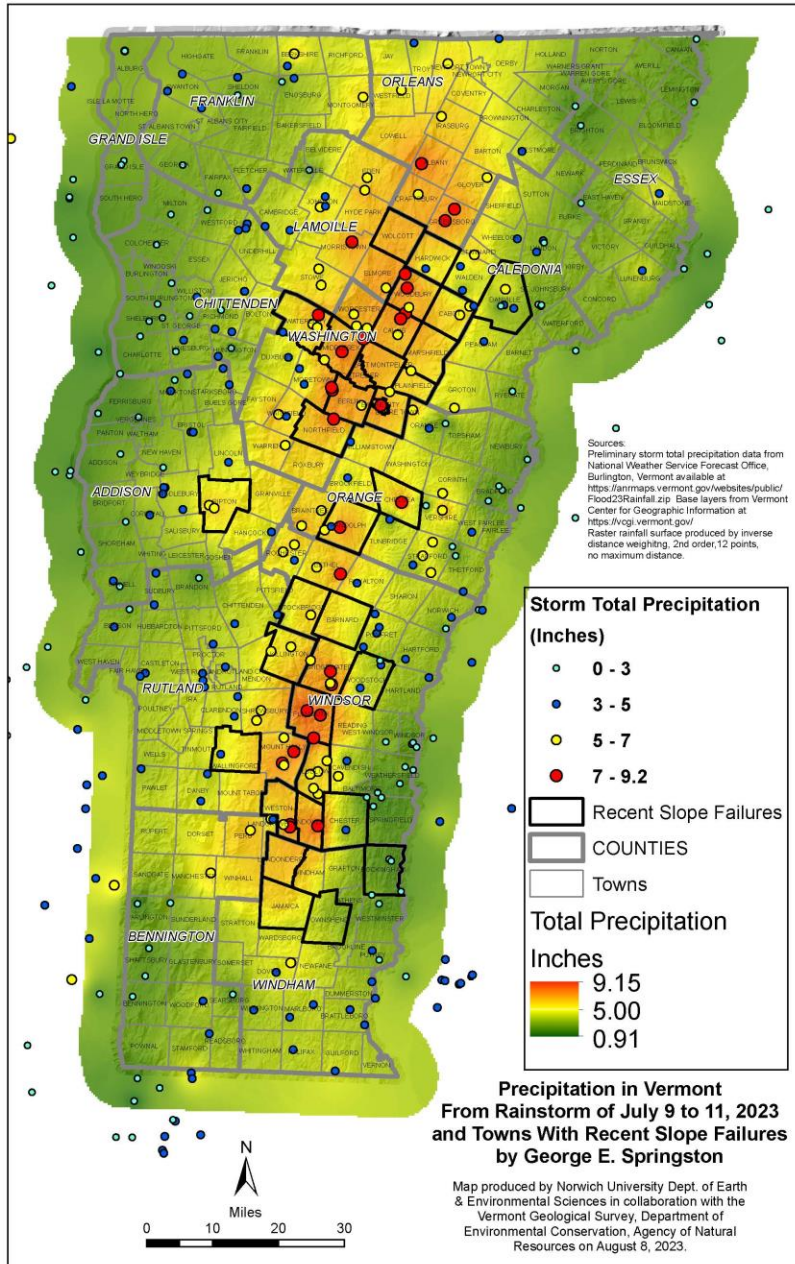


# The Green Mountain "Juicer"





# Historic Landslide Hazards



**From:** Dejong, Benjamin <[Benjamin.DeJong@vermont.gov](mailto:Benjamin.DeJong@vermont.gov)>

**Sent:** Wednesday, July 12, 2023 7:53 AM

**To:** Beling, John <[John.Beling@vermont.gov](mailto:John.Beling@vermont.gov)>

**Subject:** Landslides

Hi John,

Rather than email all Directors and plug up DEC and inter-agency email, I thought I'd just direct this simple request to you:

The past couple days, focus has been on the rivers and flooded areas. Starting today, this will begin pivoting to the hills and adjacent areas experiencing erosion and landslide hazards. I'll be assembling something of a "landslide team" with our academic partners to respond to concerns.

*As you hear about and/or receive emails regarding landslides, could you please forward them to me so I can inventory all the issues?*

Thanks,  
Ben



**VERMONT**  
AGENCY OF NATURAL RESOURCES  
Vermont Geological Survey



# Landslide Status by the Numbers

Status	Sites
1	39
2	31
3	0
4	11*
<b>Total</b>	<b>81</b>

*\*2 roads; 1 fire dept.; 8 residential structures*

## 1. No Immediate Risk/Action Required



## 2. Unstable; Needs Mitigation or Ongoing Monitoring



## 3. Unstable; Needs Evaluation by State Fire & Safety



## 4. Evacuation Recommended; Review by State Fire & Safety





# Significantly Increased Coordination

- Close, frequent contact with SEOC
- Immense support from Norwich University partners
- Deputized two prior VGS staff members
- State partners
  - Geotechnical evaluation by VTrans staff
  - Structural engineering perspective from Urban Search and Rescue
  - Department of Public Safety Fire (VEM, Fire Safety)
- Geotechnical Support from PennDOT under EMAC



*Enabled Fast & Effective Response*







# 2022 NOAA Climate Summary for VT

**Key Message 1: Temps have risen 3 degrees F since the beginning of the 20<sup>th</sup> century**

**Key Message 2: Annual average precipitation has increased nearly 6" since 1960s**

## KEY MESSAGE 3

Extreme weather events, particularly floods and severe storms, are having a stronger impact on Vermont. At the same time, multiyear meteorological and hydrological droughts continue to pose challenges for water-dependent sectors. Extreme rainfall events are projected to become more frequent and intense in the future.





# Summary

*This was historic, and exposed just how susceptible our state is to failing slopes*

- Fast & effective response requires
  - Capacity
  - Coordination: geologists and geotechnical/structural engineers, DPS
  - Well-defined roles and responsibilities
- Challenges ahead:
  - How to handle hazardous parcels not eligible for FEMA support?
  - Identification and management of landslide-prone areas of Vermont

