

USMP in the National Park Service



Denali National Park & Preserve

Why should NPS attempt to be systematic about managing unstable slopes?

- Policy (life and safety) —————> Risk reduction
- Proactive management is cost effective.
- Liability

Slopes adjacent to transportation corridors and other facilities are geotechnical assets and should be managed accordingly with a systematic, defensible management program not unlike other management programs for assets such as retaining walls or hazard trees.

NPS Servicewide reporting

Summary & Categorization of Documented Geologic Hazards of the National Park System

- Natural Resources Report 2014/813

Park web pages, Inside NPS reports, case incident reports, media...

- Not IMARS

All Geologic hazards (1927-2013)

141 Damaged or destroyed facilities

72 deaths

124 injuries

Rockfall is the most reported cause of incidents.

Information reported Servicewide is just the tip of the iceberg.

Yosemite rockfall database:

15 deaths

85 injuries

510 infrastructure impacts

NPS Policy regarding Hazards and Safety

“The saving of human life will take precedence over all other management actions as the Park Service strives to protect human life and provide for injury-free visits. The Service will do this within the constraints of the *1916 Organic Act*. The primary-and very substantial-constraint imposed by the Organic Act is that discretionary management activities may be undertaken only to the extent that they will not impair park resources and values.

Parks “should strive to minimize the frequency and severity of visitor incidents by developing a range of appropriate prevention strategies and implementing risk reduction mitigation plans.”

- NPS Management Policies (2006) section 8.2.5.1 (Visitor Safety)
- Director’s Order #50c

NPS Policy regarding Hazards and Safety

“The Service will work closely with specialists... to devise effective geologic hazard identification and management strategies.”

“....park managers will strive to understand future hazards and, once the hazards are understood, minimize their potential impact on visitors, staff, and developed areas.”

“NPS managers and their teams must proactively identify and document facility vulnerabilities to climate change and other natural hazards.”

- NPS Management Policies (2006) section 4.8.1.3 (Geologic Hazards)
- NPS Policy Memorandum 15-01

Federal Tort Claims Act

Allows recovery under state tort law against the U.S. for injuries caused by government negligence.



Point Reyes National Seashore March 2015 bluff collapse.

Federal Tort Claims Act

Federal Tort Claims Act suites generally have to do with negligence

Negligence is the calculus of three factors:

- How likely is a failure to occur (the risk)
- What are the possible consequences should the failure occur (the gravity or magnitude)
- What is the burden of alternatives or precautions.

Negligence is the failure to exercise the standard of care of a reasonable person under similar circumstances.

The USMP strives to be a transparent and reasonable guide for managing unstable slopes.

Discretionary Function Exception (Federal Tort Claims Act)

Protects the NPS and other FLMAs from litigation as long as two conditions are met:

- Did law prescribe action or lack of action?
Determine whether the decision to act or not act was in fact discretionary, that is whether any statute, regulation, or policy specifically prescribes a course of action.
- Any action or lack of action beyond what is required by law or policy is discretionary as long as decisions involve a combination of policy considerations such as safety, aesthetics, environmental impact, and available financial resources. These kinds of decisions are most defensible if they result from a reasoned and documented decision making process.

The DFE is was designed to protect against disagreement with the balance struck by Federal Agencies in weighing priorities, or the belief that some other policy would have been better.

Discretionary Function Exception (Federal Tort Claims Act)

- Generally, courts have held that decisions about what safety measures to employ in National Parks and how to execute them involve balancing the same considerations that inform all policy decisions regarding the management of national parks: safety, aesthetics, environmental impact, and available financial resources.
- Discretionary decisions may be viewed as non-discretionary if a decision making process has concluded and a decision to act has been recorded.

Example - lightening rod, Mount Whitney
Sequoia & Kings Canyon National Parks

Macleod v. United States, Civil No. CV 91-3652 WJR (C.D. Cal. 1994).

Discretionary Function Exception (Federal Tort Claims Act)



Recently Courts of Appeals have ruled that Hazard Tree Management Plans meet the DFE conditions as long as the Hazard Tree Management Plans are not prescriptive.

Autery v. United States

United States Court of Appeals, Eleventh Circuit. June 11, 1993.

Great Smoky Mountains National Park

Merando v. United States

United States Court of Appeals, Third Circuit. February 20, 2008.

Delaware Water Gap National Recreation Area

How is proactive management beneficial?



Utah State Route 9 closed September 23rd, 2015 in Zion.

Rockfall occurred following the tragic death of seven due to flash flooding.

Required activation of an Incident Command System.

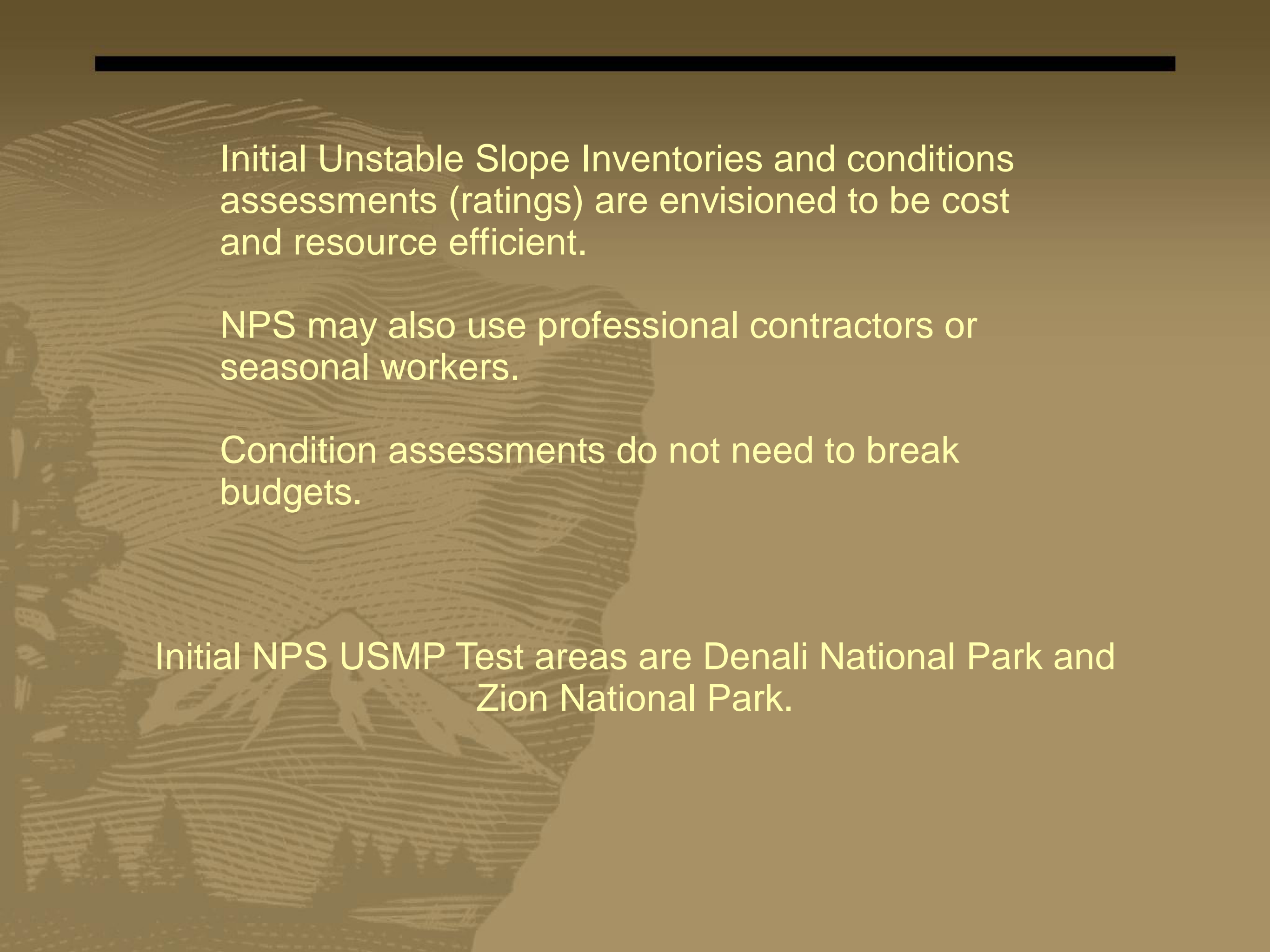
Occurred at the very end of the federal fiscal year.

Required emergency evaluation from federal and state specialists.

Two emergency contracts, hoe-ram, rock moving and blasting.

~\$120k for emergency, probable ~\$25k scheduled.





Initial Unstable Slope Inventories and conditions assessments (ratings) are envisioned to be cost and resource efficient.

NPS may also use professional contractors or seasonal workers.

Condition assessments do not need to break budgets.

Initial NPS USMP Test areas are Denali National Park and Zion National Park.

Denali National Park & Preserve

92 mile Denali
Park Road

Significant Park
Asset

141 USMP sites
rated

Ratings done by
term employees

Ratings range from
164 to 948 with a
mean value of 328.

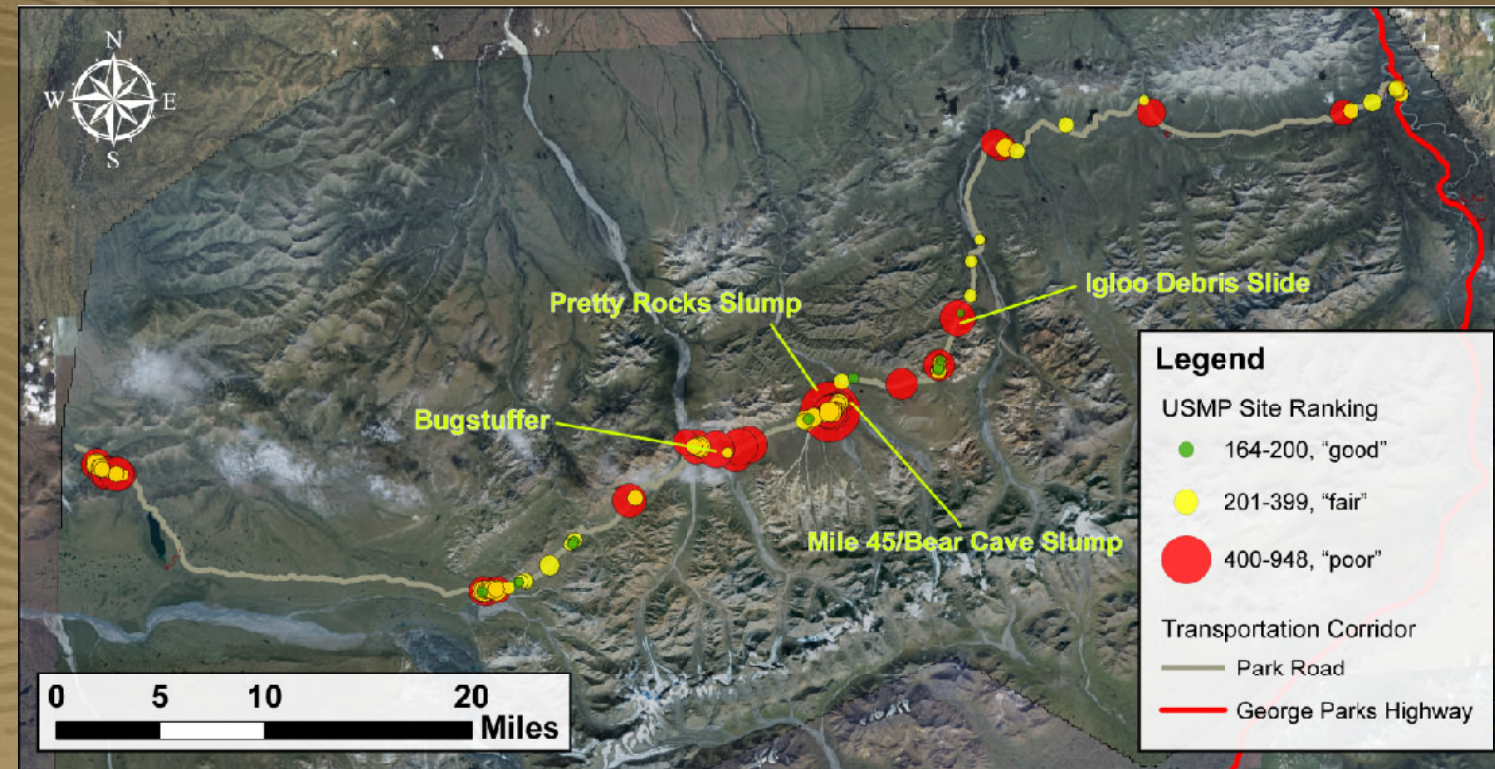
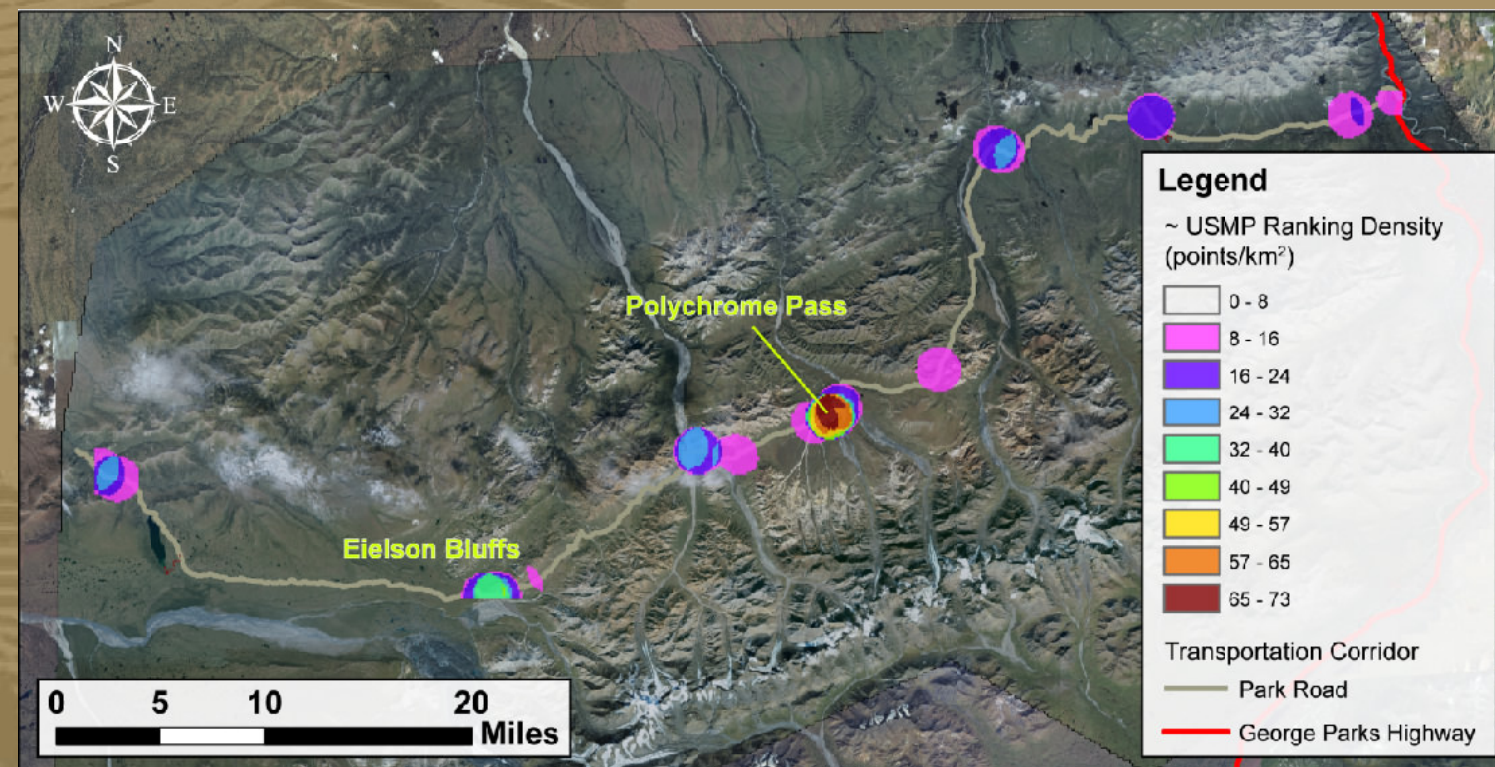


Figure credit:
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See also: Capps, D.M, Rosenberg, R., Collins, A., Hooper, S., Rogers, H., Anderson, D.A., and Bilderback, E. (2017) Geohazards Risk Assessment of the Denali National Park Road, In De Graff, J.V. and Shakoor, A. (eds.), Landslides: Putting Experience, Knowledge and Emerging Technologies into Practice, AEG Special Publication No. 27, p. 840-850.



Zion National Park Example:

Initial groundwork of setting up a successful USMP is an opportunity for youth engagement and fostering the next generation of Public Lands stewards.

Youth initiatives:

Geoscientists-in-the-Parks (GIP), Mosaics in Science Diversity (MIS), and the George Melendez Wright Initiative for Young Leaders in Climate Change (YLCC).

Example: AmeriCorps GIP for three months.

Administrative costs: \$3,550.

Stipend: \$3,600.

Realistic to rate 300 slopes, perhaps many more.

Zion USMP

In the wake of the 2015 rockfall Zion was interested in starting an USMP

- AmeriCorps GIP
- Two days of training
- Three month internship
- 236 slopes rated
- ~\$30 a slope in personnel costs, but the benefit was way more than just slope ratings.

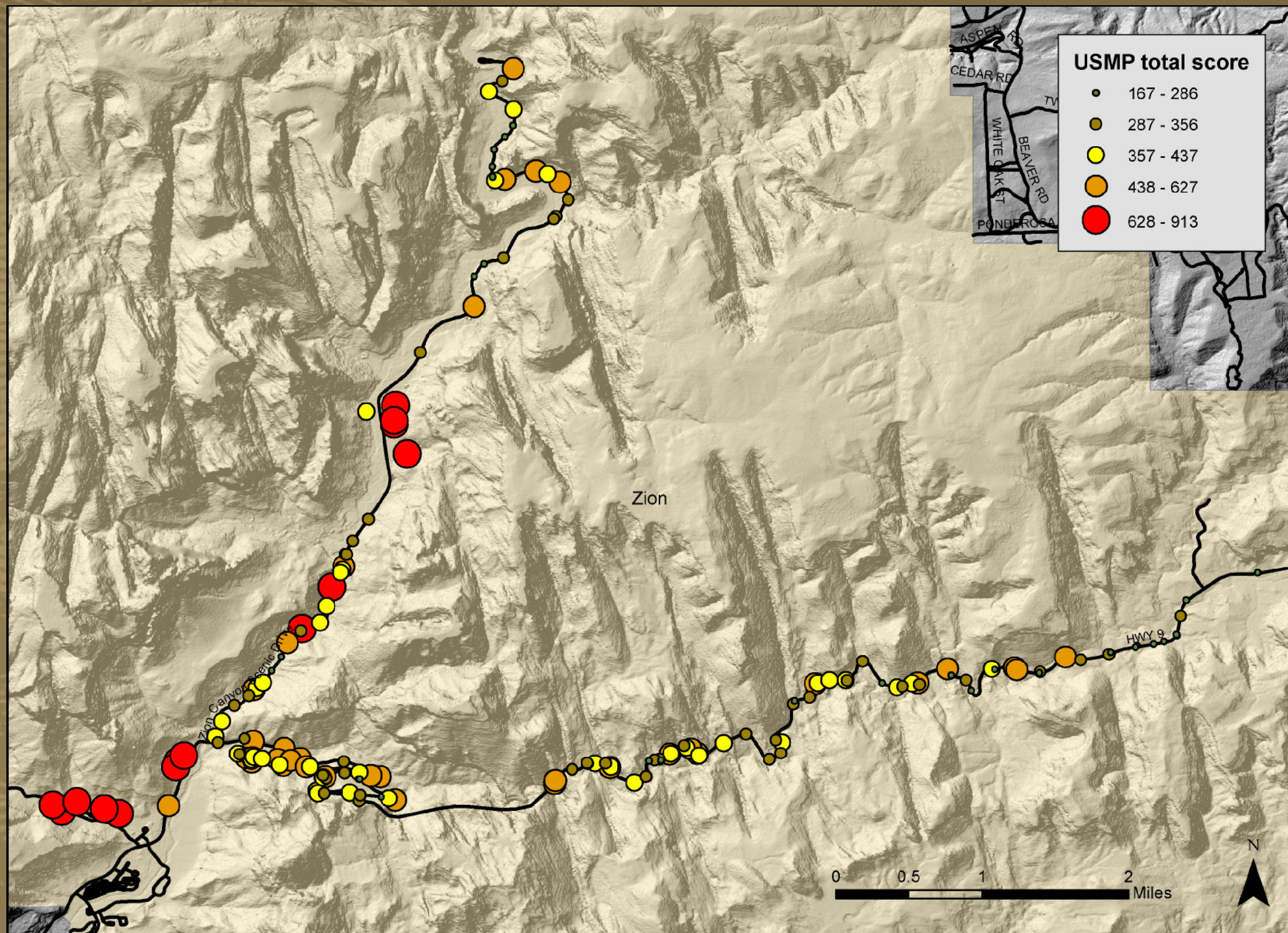


Zion National Park USMP Data summary

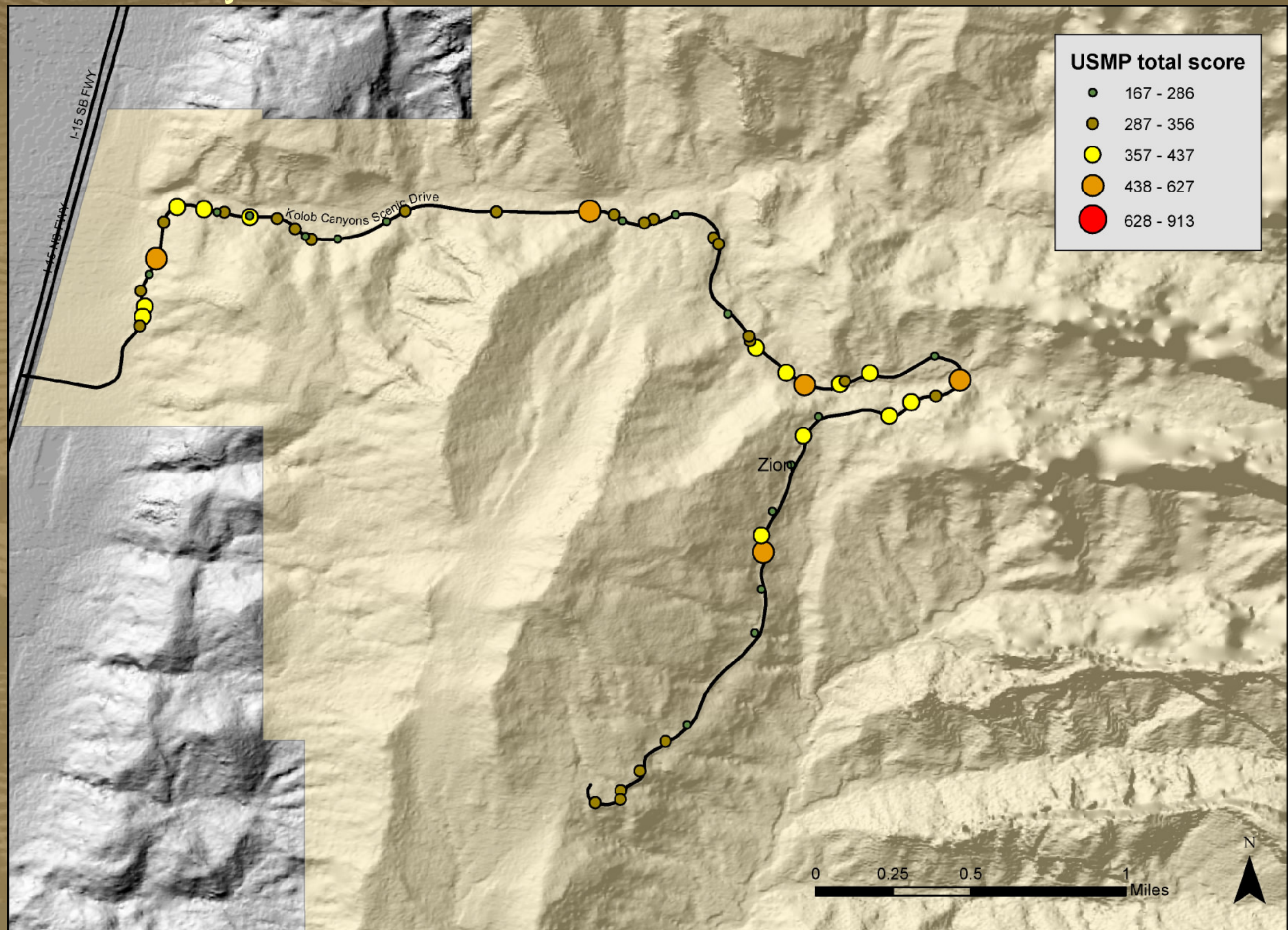
12 slopes threatening buildings,
1 slope threatening a trail,
233 slopes threatening roads

<u>Statistic</u>	<u>Slope Hazard Rating</u>	<u>Total USMP Scores</u>
Min	38	167
Q1	115	297
Q2	160	349
Q3	219	430
Max	485	932
Mean	172	386
Median	160	349

Zion Canyon & Mount Carmel Highway



Kolob Canyon





Then the storms hit and put the ratings to the test.

December and January monthly precipitation more than a inch greater than 1981-2010 average.

Zion Lodge was hit by rockfall.

- The slope rated very high because of the occupation of the building.

Next, slope 1239 failed.

- Justin LaForge rated the slope a month before it failed.
The slope was flagged as toppling/undercutting with water seeping out of the slope.
- The slope rated middle high, 45th out of 236 slopes in Zion.
Total rating = 471

Slope rating pictures





Slope rating pictures







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Zion National Park News Release

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For Immediate Release

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16-39

Road Closure at Zion due to Large Rock and Debris Slide

No injuries occurred; road closed until further notice.

SPRINGDALE, UT – The road is closed on Zion National Park's Scenic Drive just north of the Zion Lodge. At approximately 6 p.m. Friday night, a large rock and debris slide occurred just north of the Grotto covering both lanes on the Scenic Drive. The slide was about the size of four car lengths, (approximately 200 tons of rock and debris) covering both lanes, and making it impassable by vehicle. No one was injured in the incident.

At the time of the slide, twelve vehicles were on the opposite side of the slide. In collaboration with Zion Lodge personnel, all but one party were shuttled to their respective hotels. The party that elected to remain in their vehicle had adequate provisions for the night, and will be evacuated today.

Visitors are not allowed to walk past the Grotto. The Temple of Sinawava and Weeping Rock trail heads are closed. Saturation remains a concern and further slides are possible throughout the

Zion Lodge

1,224-2,139 lb
boulder struck
the lodge



Questions?

