

# Oregon Dam Safety Update



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**Oregon 2015 Dam Safety Conference**



# This Presentation

- Conference objectives
- Update of OWRD dam safety activities
  - Periodic safety inspections
  - Correct hazard rating (Hydraulic Inundation Analysis)
  - Safety condition
  - Emergency actions and plans
- Rules going to Water Resources Commission in March
- Feasibility studies and design priorities

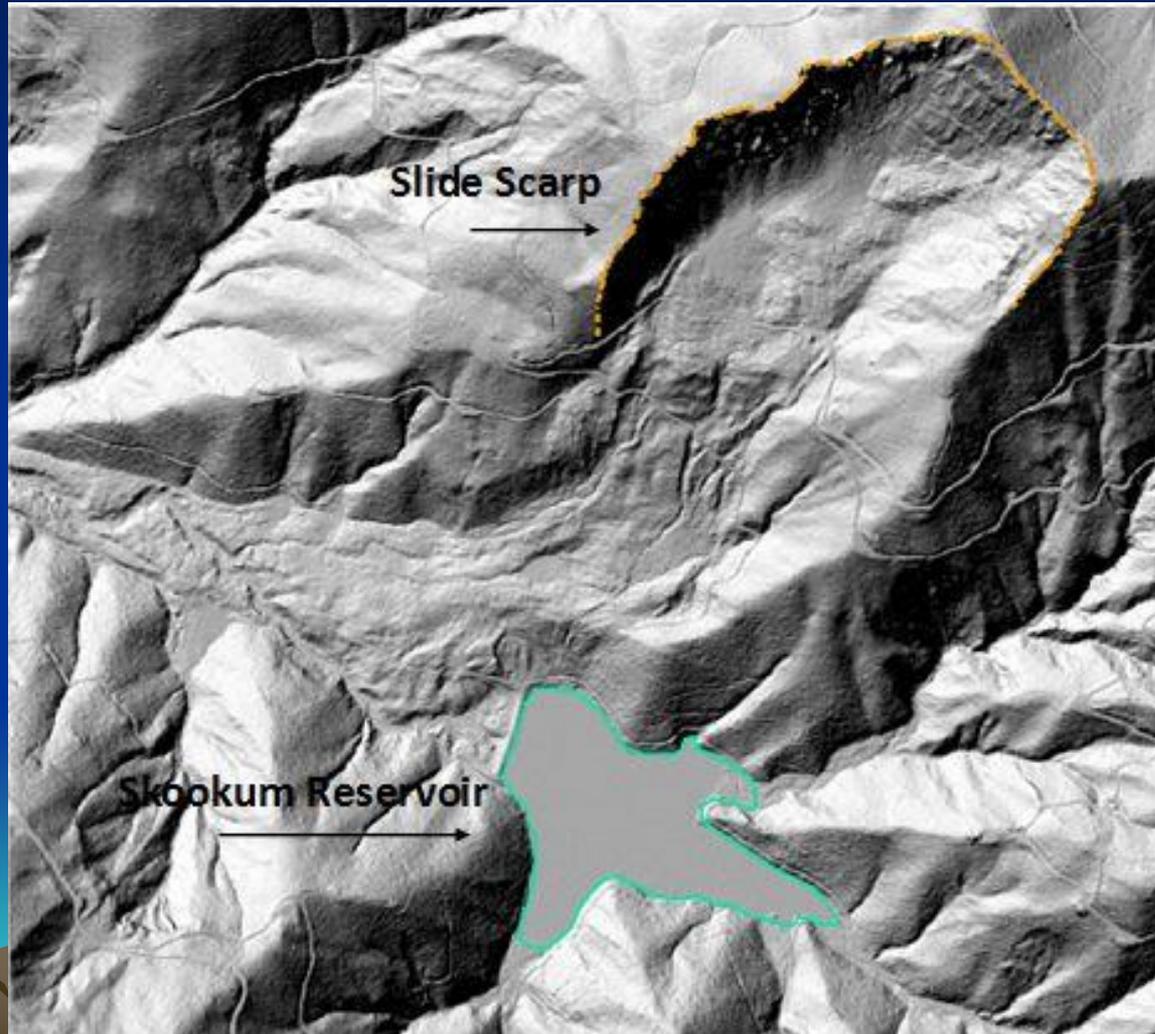


# Conference Objectives

- Better understanding of vulnerabilities
  - Extreme flood potential – how big
  - Seismic – Cascadia subduction zone
- Emergency Preparation
- Making old and or deficient infrastructure safe
- Moving forward



# LiDAR Indicated Vulnerability



# Oregon Dam Safety

- Barry Norris retired in 2013
- State Engineer
- Eastern Oregon Coordinator
- Engineering Intern
- 21 Watermasters
- Assistant Watermasters



# Dam Safety Coordination



# State versus Federal Regulation

Hazard Rating	Federal Inspected	State Inspected	Totals
High	66	71	137
Significant	29	145	174
Low	187	723	910
Totals	285	936	1221



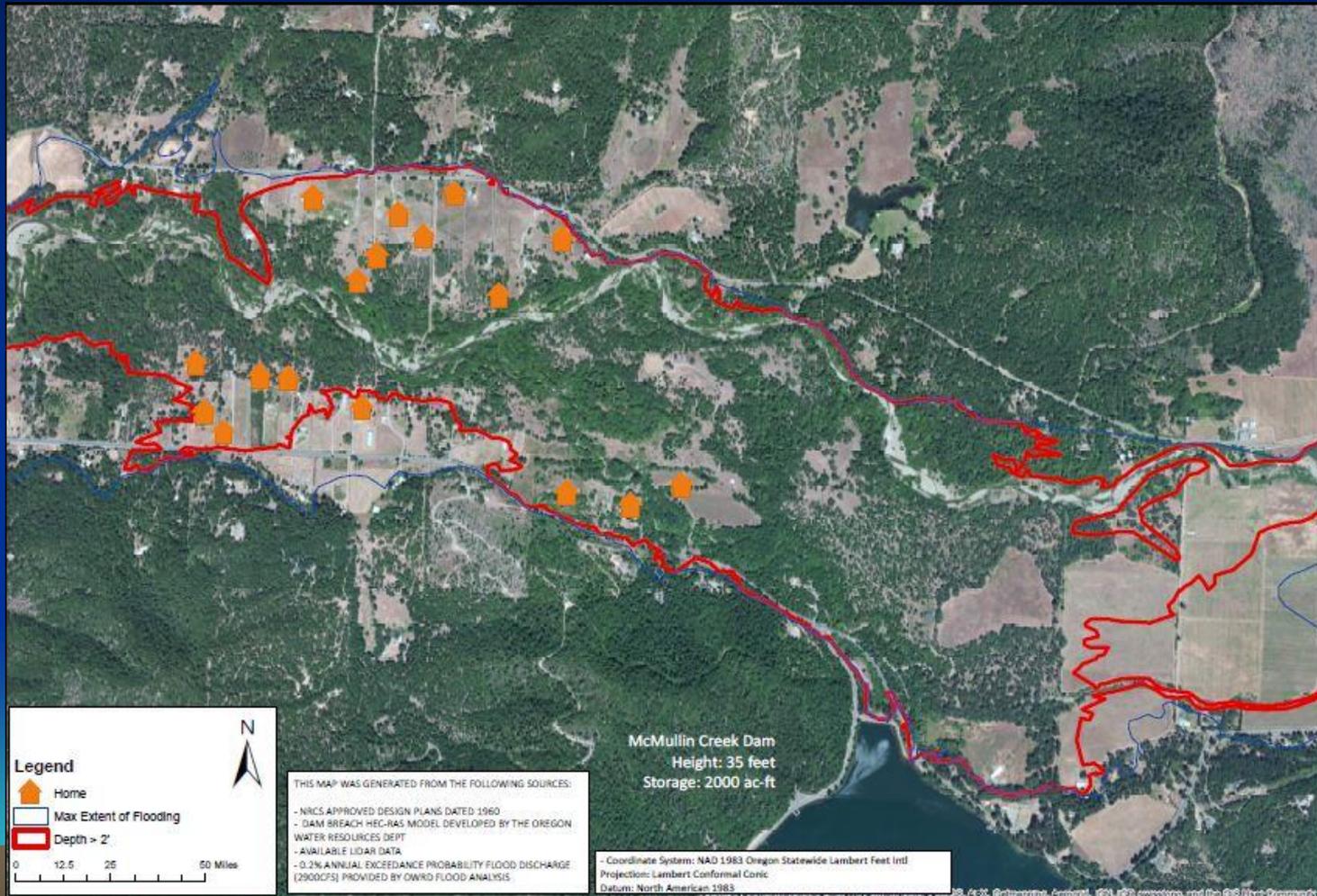
# Dam Safety Inspections



2014 Silver Creek Dam inspection

# Hazard Rating Analysis

Consequences of failure, not based on dam condition



# Hawaii Dam Failure

## Kaloko Dam

- Failed in 2006
- Rated as low hazard
- Spillway filled uninspected
- Thought low priority
- Killed 7 people
- SEVERE CONSEQUENCES FROM INCORRECT HAZARD RATING



**Inundation Area after breach**

# Dam Breach Analysis

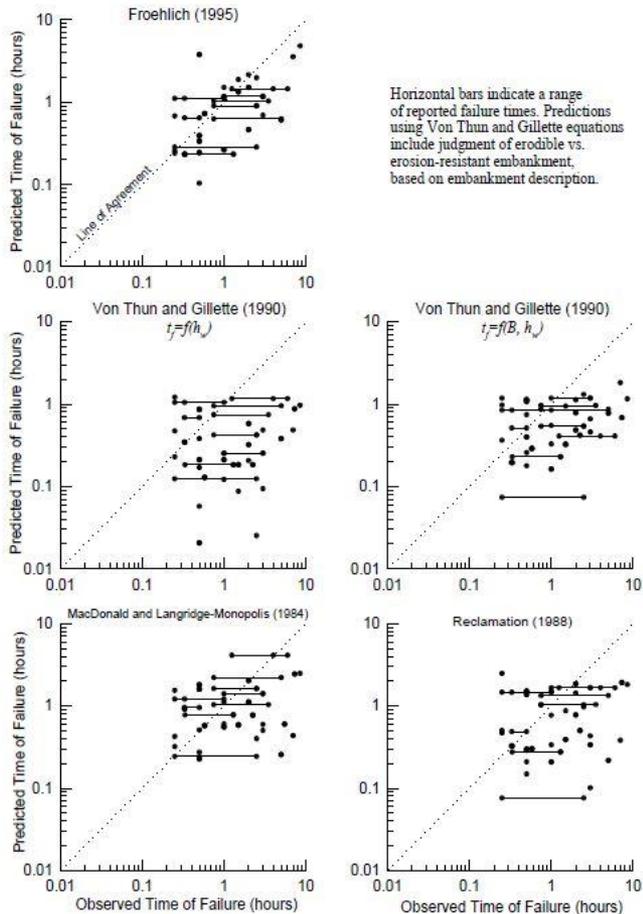


Figure 12. — Predicted and observed time of failure for dams in the case study database.

**US Army Corps of Engineers**  
Hydrologic Engineering Center

## HEC-RAS River Analysis System

# Safety Condition of the Dam

- The Condition Rating; A Dams ability to store and release water in a safe manner. (Dam safety engineer's analysis – high hazard)
- Satisfactory – No deficiencies
- Fair – Maintenance needed, minor deficiencies
- Poor – Major repairs needed
- Unsatisfactory – Failure reasonably possible



# Lower Cinnamon Lake Dam

Identified, Engineered and Repaired in less than 1 year



# Safety Issues in Oregon

- Good safety record (no Oregon fatalities)
- Old conduits and valves
- Old concrete in eastern Oregon
- Floods and spillway capacity
- New understanding of seismic risk



# Conduits through the Dam



Note side of pipe



Condition after Removal

Corrugated metal culverts through dams

# 2007 Flood Dam on Clatsop/Columbia County Line



**Water filled to crest, all boats and logs through morning glory spillway  
Auxiliary spillway designed, ODFW large sluice – Thursday Inspection**

# Aging Dams

- Dam owner must act if unsafe and risk to people
- 3 dams with required safety repairs - 2014
- Historical storage restrictions
  - Wallowa (1981)
  - Malheur (1942)
  - Potential for increased storage if repaired



# Old Concrete Dams Crowley and Wallowa Lake



# Is There a Spillway Issue?



# Seismic Studies Underway



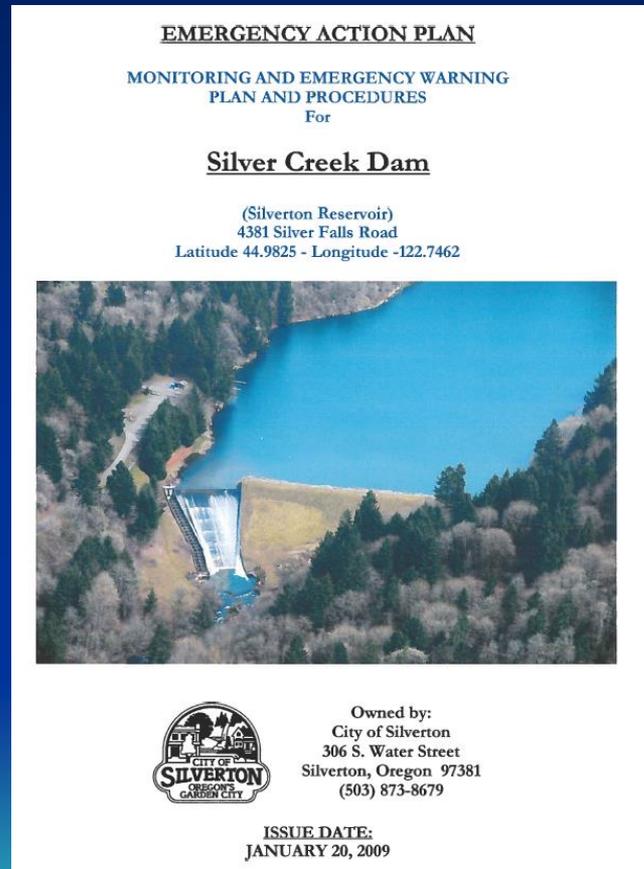
**Newport Lower Dam**



**Bear Creek Dam (Astoria)**

**Partial funding from Dam Safety and SB 1069  
Coos Bay North Bend lower water supply dam also under discussion**

# Emergency Preparation



- Emergency Action Plan
  - Recognize conditions
  - Actions
  - Inundation map
  - Responsible parties
  - Notifications
- Voluntary for existing dams
- FEMA grant funding effective – increase by 4-5 each year

# Rule Making

- Simple steps for owners and engineers
- Specific design objectives for engineers
- Seismic and floods based on hazard rating
- Specific inundation analysis criteria
- Thorough review of authorities by DOJ



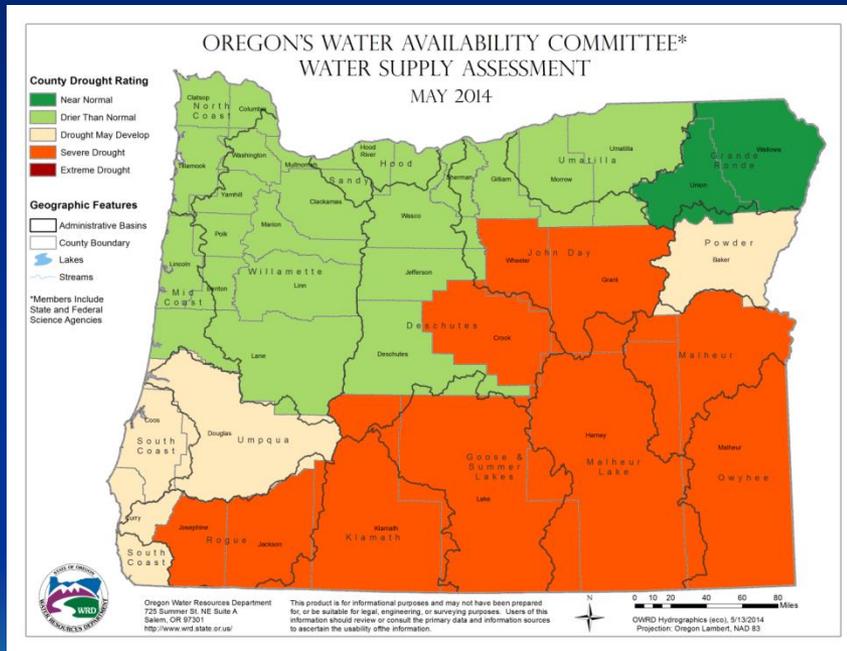
# Drought and Storage Feasibility

- Many drought declarations
- Less snowpack – is this the new normal?
- Off channel storage preferred
- Site controls on dam design needs
- State support if releases for fish and water quality
- Need for and cost of delivered water



# Oregon Droughts

- Last year it was dry until February
- Very low snowpack now
- Water Availability Council will discuss



# Feasibility Studies and New Dam Design

- Guidance development for feasibility
  - Available water, what is the need
  - Site constraints and costs
  - Off channel and releases for aquatic life
- Designs consistent with site and hazard rating
  - Include inundation analysis
  - Easy for owner, contractor, dam safety
  - Engineer of record in charge



# Upcoming events

- Dam Safety rules to Commission March 13
- ASDSO webinars and conference
  - Webinars monthly
  - HEC HMS in Seattle March 30-April 1
  - Annual Conference – New Orleans – Sept.
- USGS working on HEC-RAS course
- ASDSO West Region conference on seismic and hydrologic next year



Questions?

