

# Oregon Dam Safety Program



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**November 2014 Water  
Resources Commission Meeting**

# Dam Safety Program: Today's Presentation

- Statutory Authority
- Design review and approval required
- Periodic safety inspections
- Correct hazard rating (Hydraulic inundation analysis)
- Safety condition
- Emergency actions and plans
- Rule-making

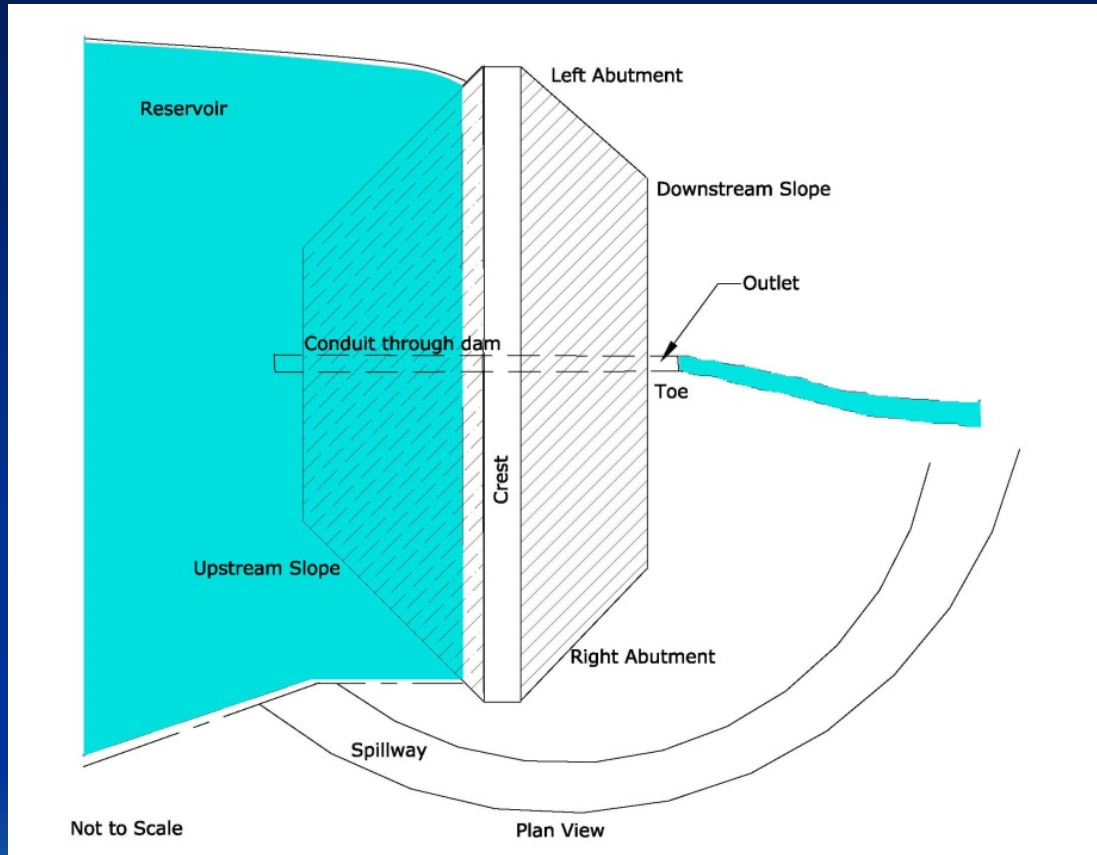


# Statutory Authority

- Law since 1929 (Saint Francis Dam failure in California)
- ORS 540.340 to 540.400
- Focuses on life and property
- Dams at least 10 feet high; and
- Storing over 3 million gallons (9.2 Acre feet)

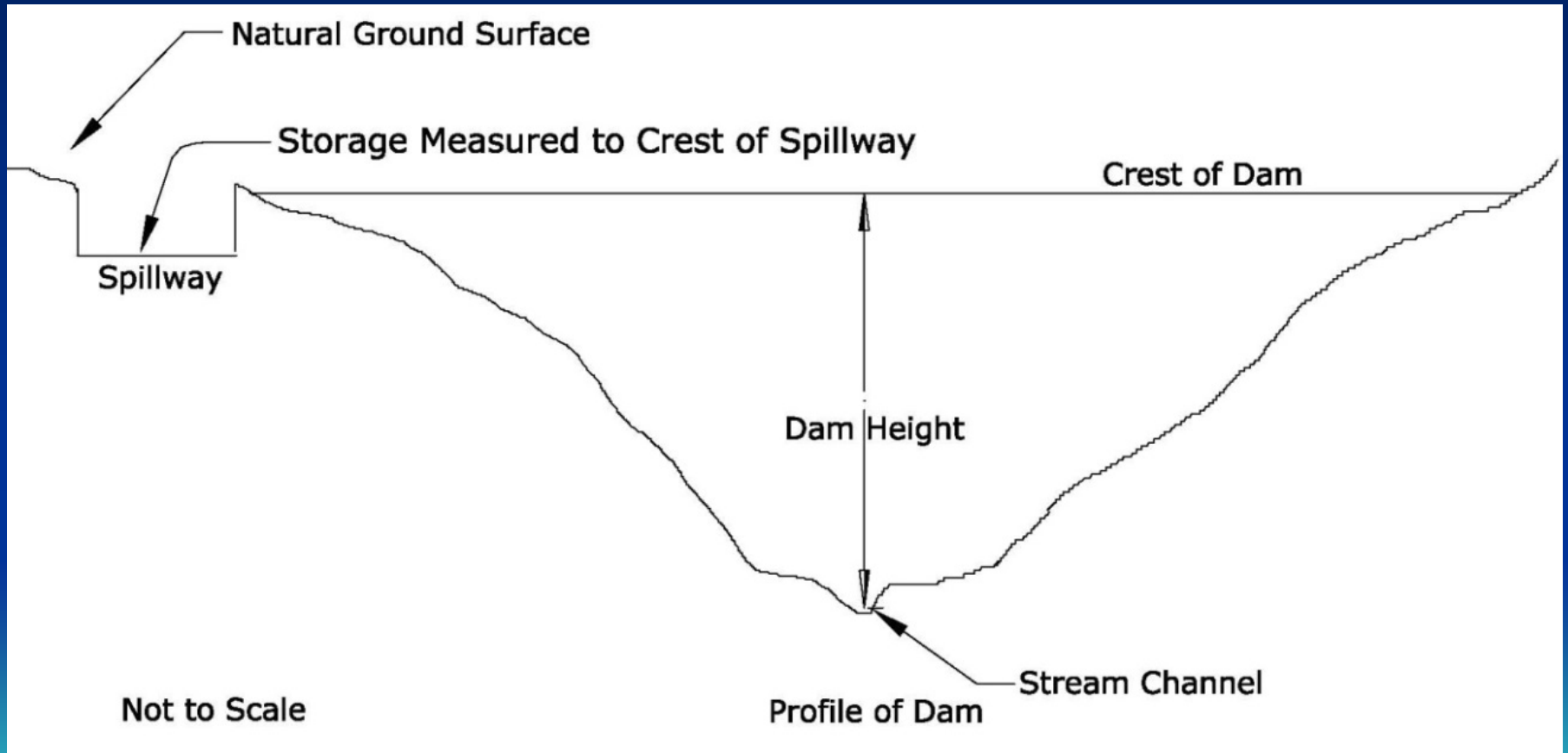


# Dam Safety Designs



Simplified plan view drawing

# Height and Storage Measurements



# Dam Safety Inspections

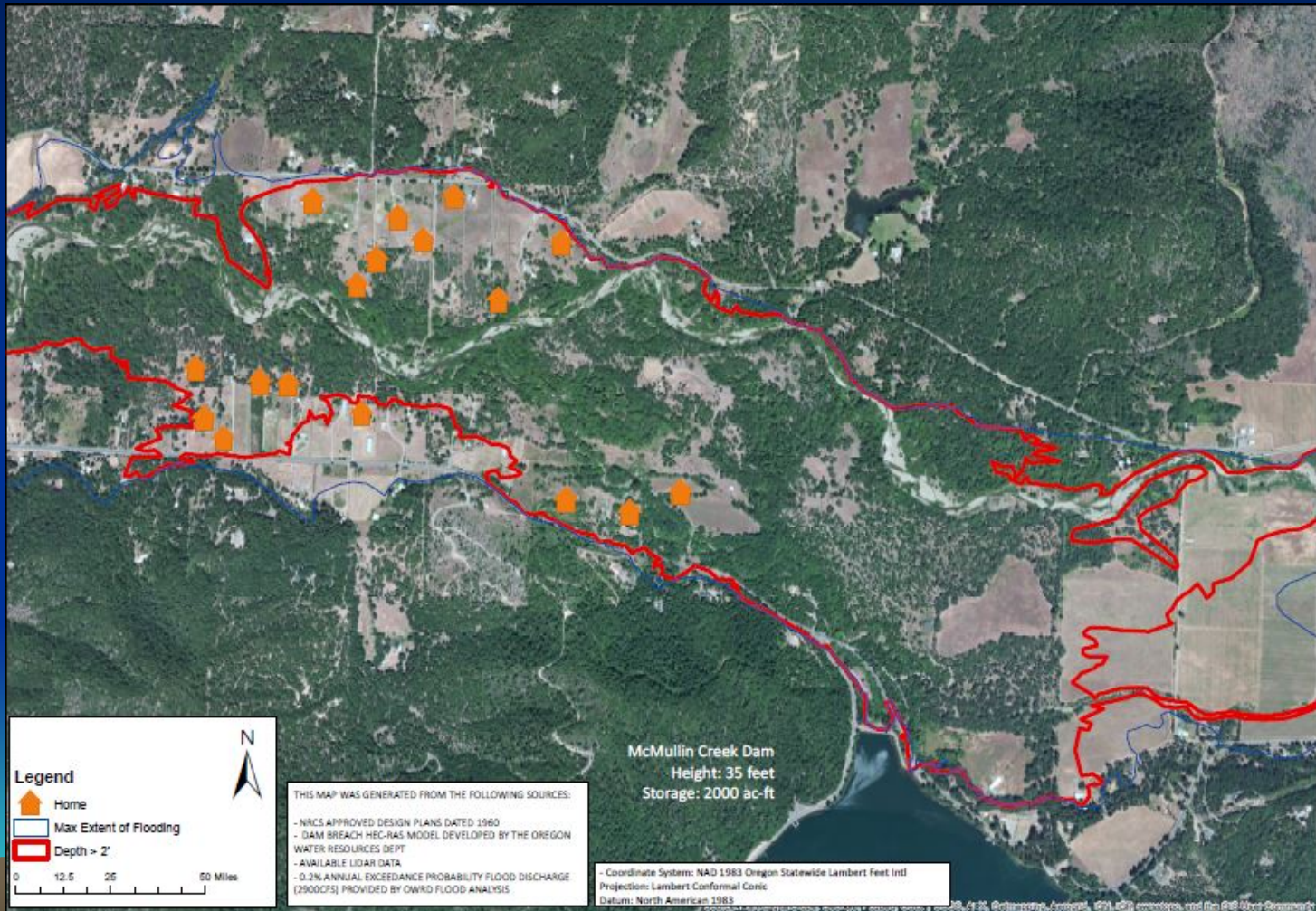


**Owner and Assistant Watermaster**



# Hazard Rating Analysis

Consequences of failure, not based on dam condition



# Hazard Rating

- Hazard rating = the consequence should the dam fail
  - High – loss of life
  - Significant – property damage
  - Low – small risk to life, or others property

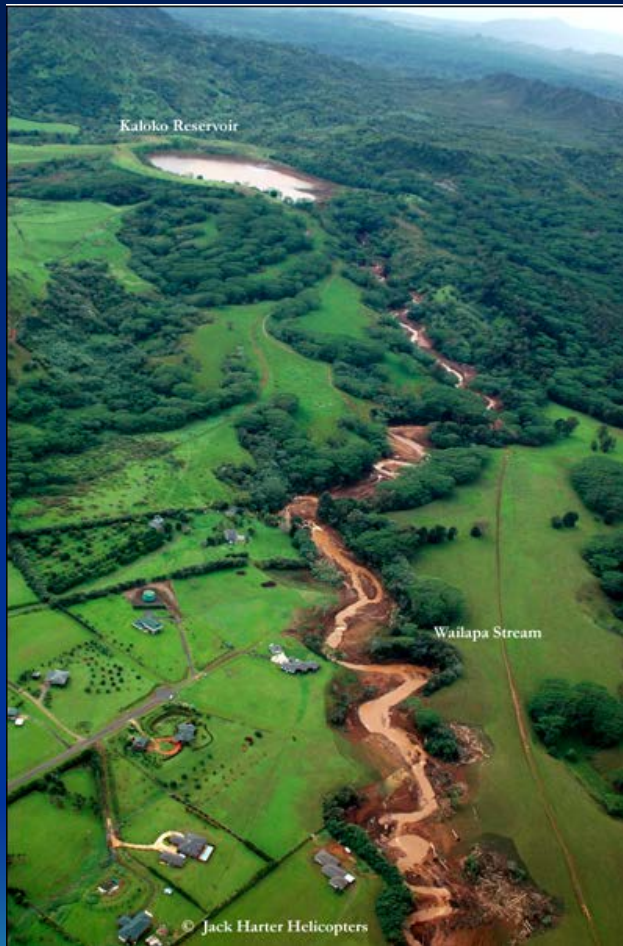




# Hawaii Dam Failure

## 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**

# Hazard Rating in Oregon

- 18 dams analyzed in 2013 (hydraulic consultants)
- 68 high hazard dams, a net increase of 7
- Inspection frequency and whether by dam safety engineer
- Priority for analysis or enforcement
- Continuing with engineering intern (PE Review)



# State versus Federal Regulation

Hazard Rating	Federal Inspected	State Inspected	Totals
High	69	68	137
Significant	29	145	174
Low	187	723	910
Totals	285	936	1221



# Safety Condition of the Dam

- Condition is the ability of the dam to safely store and release water (Dam safety engineer's analysis – high hazard)
  - Satisfactory – No deficiencies
  - Fair – Maintenance needs, minor deficiencies
  - Poor – Major repairs needed
  - Unsatisfactory – Failure reasonably possible



# Safety Conditions in Oregon

- Good safety record (no Oregon fatalities)
- Old conduits and valves
- Floods and spillway capacity
- New understanding of seismic risk
- Phase 1 Reports date to around 1980
  - Last comprehensive safety review
  - Seismic hazard not then understood





# Conduits through the Dam



## Corrugated metal culverts through dams

Note sides of pipe

Condition after removal

# 2007 Flood Dam in Columbia County



**Water filled to crest, all boats and logs through morning glory spillway**



# Seismic Studies Underway



**Newport lower Dam**



**Astoria Bear Creek dam**

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

# Unsatisfactory Condition 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



# Emergency Preparation

## Emergency Action Plan (EAP) For Joe Fisher Dam

National Inventory of Dams NID-OR00248

Crook County, Oregon

For Ochoco West Water and Sanitary Authority, Dam Owner

**FINAL**

OREGON



- Emergency Action Plan
  - Recognize conditions
  - Actions
  - Inundation map
  - Responsible parties
  - Notifications
- Local authorities
- Office of Emergency Management
- FEMA



# 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



# Conclusions

- Active and busy dam safety program
- Relies heavily on field services
- Good safety record
- Performance in major quake or flood?
- Rulemaking with comments addressed
  - Next Water Resources Commission meeting



Questions?

