



Oregon Dam Safety Program

March 2018 Water Resources Commission Meeting

Agenda Item C

Keith Mills, P.E., G.E.

State Engineer for Water Resources

Today's Presentation

- **Dam Safety Jurisdiction**
- **Program Activities**
- **IWRS**
Recommendations
- **Conclusions**



Dams All Over Oregon

Arock Dam in Malheur Co.



North Fork Rock Creek



Jurisdiction

- Law since 1929
- ORS 540.340 to 400
- Life and property
- 10 feet high; and
- Over 9.2 Acre feet
- Few technical changes since 1929



Program Activities

- Inspecting dams
- Hazard Rating
- Condition of dams
- Inundation analysis
- Review and Approve designs
- Emergency Action Plans
- Action if unsafe

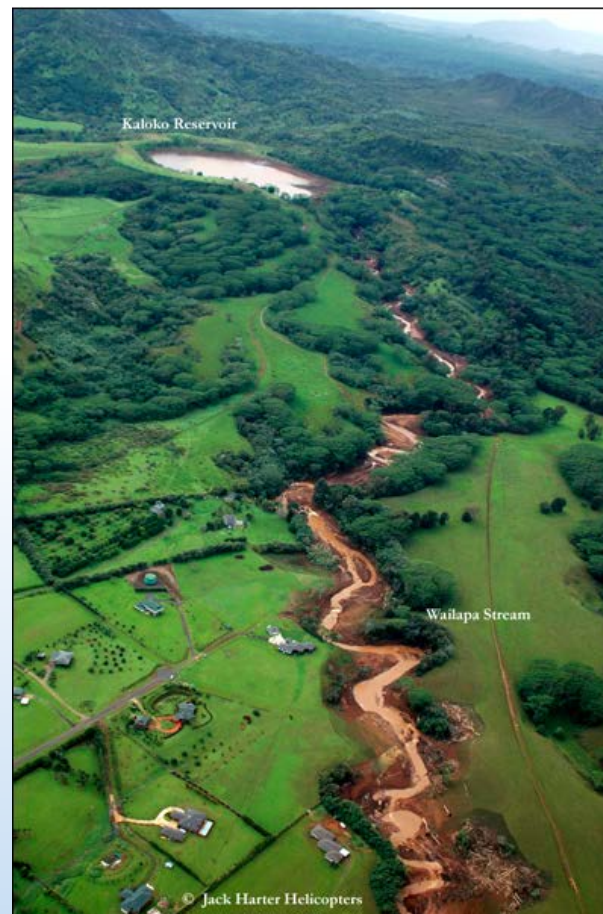


Dam Hazard Ratings

High hazard- Failure is likely to cause loss of human life

Significant hazard- Failure is likely to cause serious property damage to other owners. Loss of life unlikely, but possible.

Low Hazard- Damage mostly to dam owners property.





Responsible Agencies in Oregon

OWRD

USACE

USBOR

FERC



Photo Owyhee Dam from BOR

State v. Federal Regulation

Hazard Rating	Federal Inspected	State Inspected	Totals
High	69	75*	144
Significant	29	147	176
Low	187	747*	934
Totals	285	969	1254

Inspecting Dams

Outside of Medford



Inside Dam near Astoria



1, 3 and 6 Year Routine Inspections

Condition of Dams

Ability of the dam to safely store and release water

- **Satisfactory**
- **Fair**
- **Poor**
- **Unsatisfactory**
- **(Unsafe)**



Understanding Risks to Oregon's Dams

- Floods
- Earthquakes
- Piping
- Spillway failure
- Landslide
- Construction flaw
- Deterioration



2006 Dam Failure near Hermiston

Earthquakes



Newport Lower Dam
Dams closer to the coast
Recent investigations

Flood Overtopping

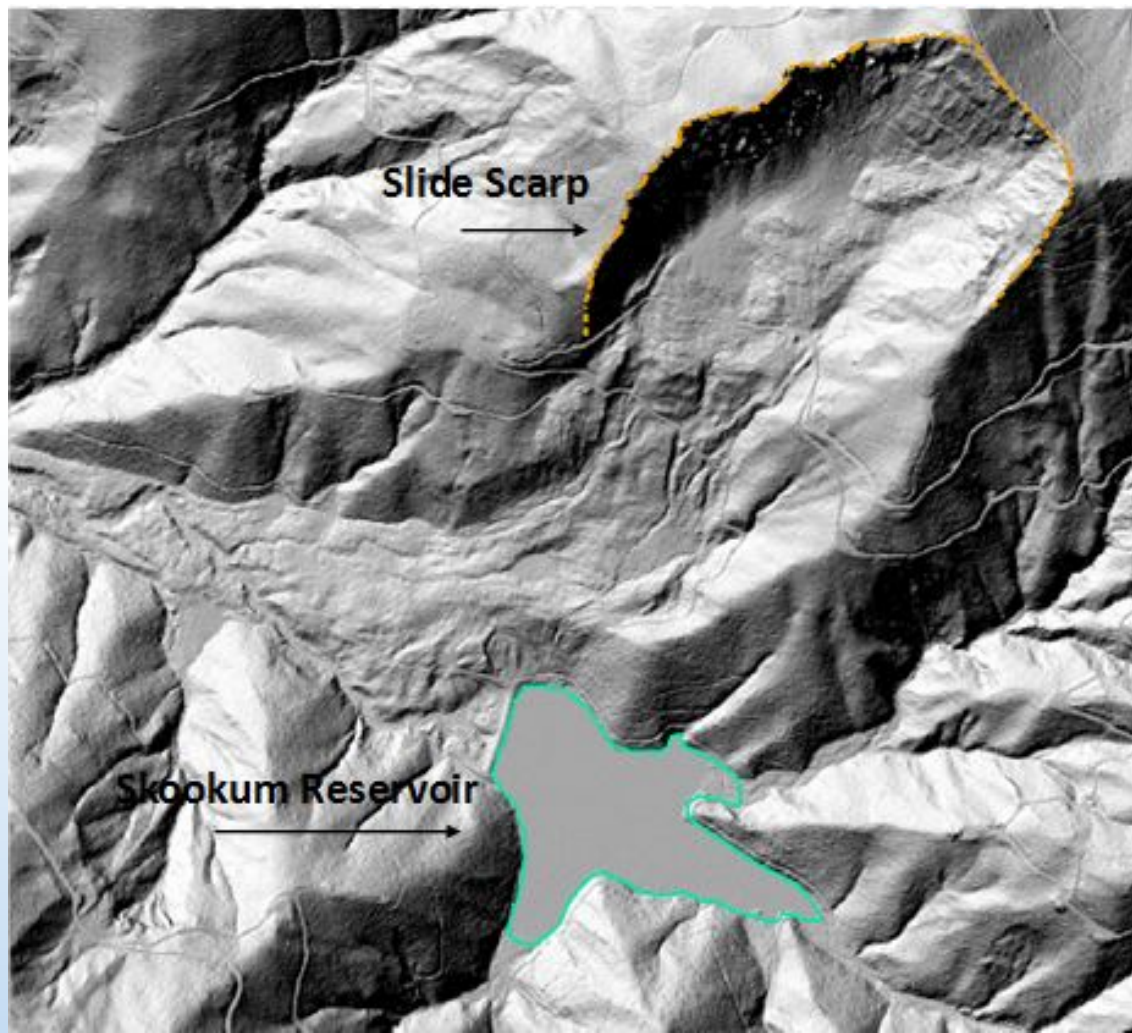


2007 Local Flood

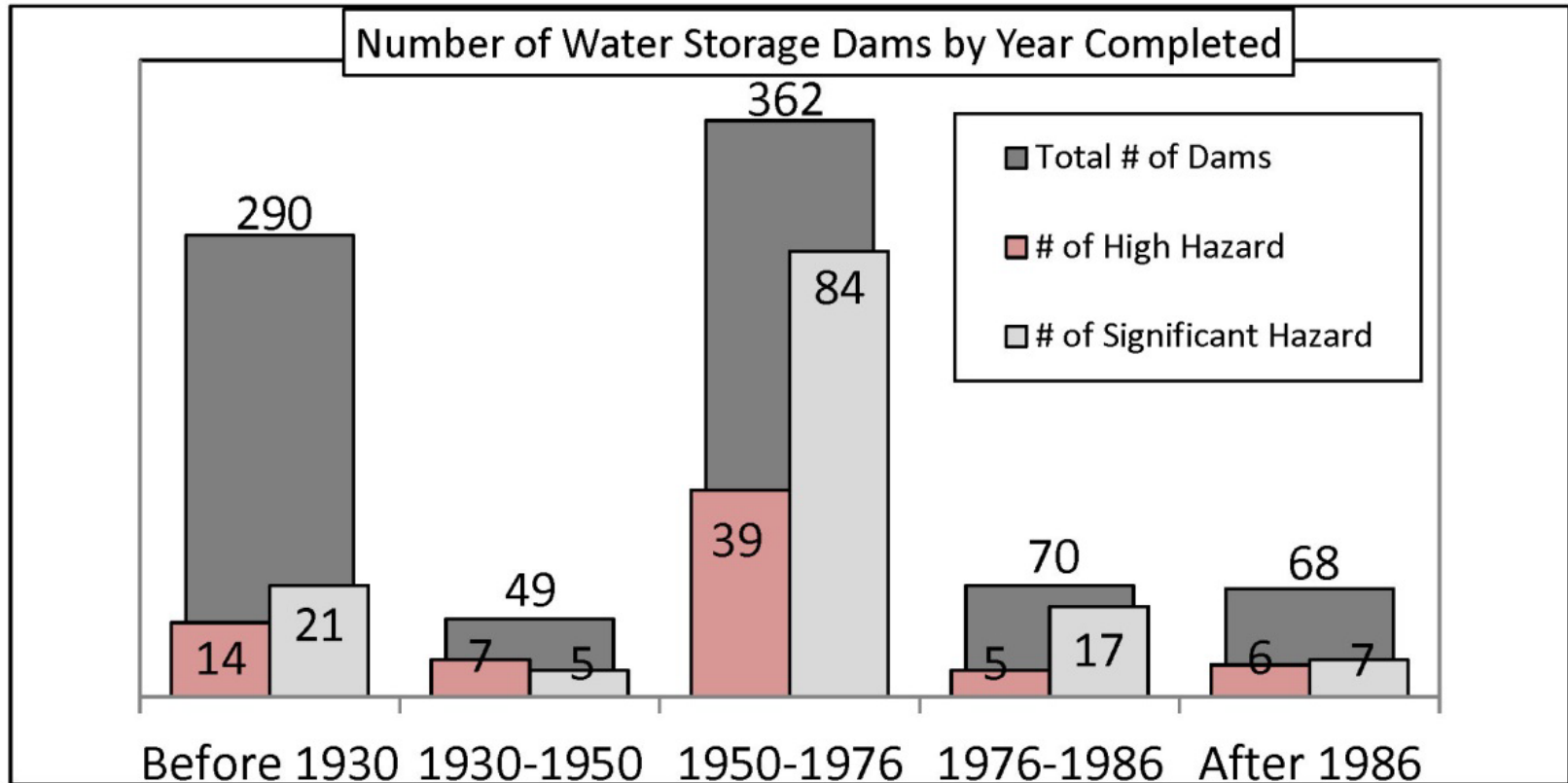


Water filled to crest, all boats and logs through interior spillway

Landslides



Oregon's Dams Are Older

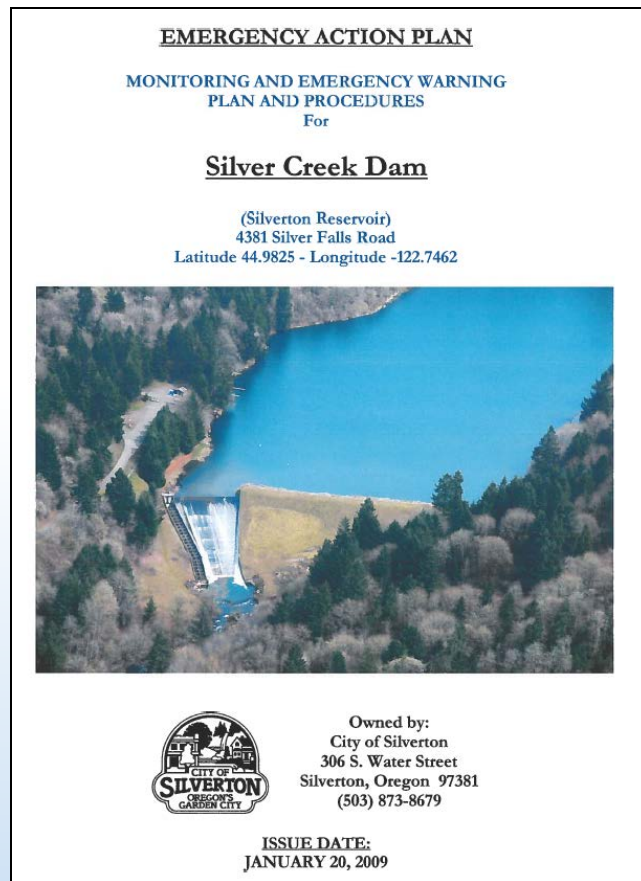


Construction Problems

Dam with Restriction from 1942



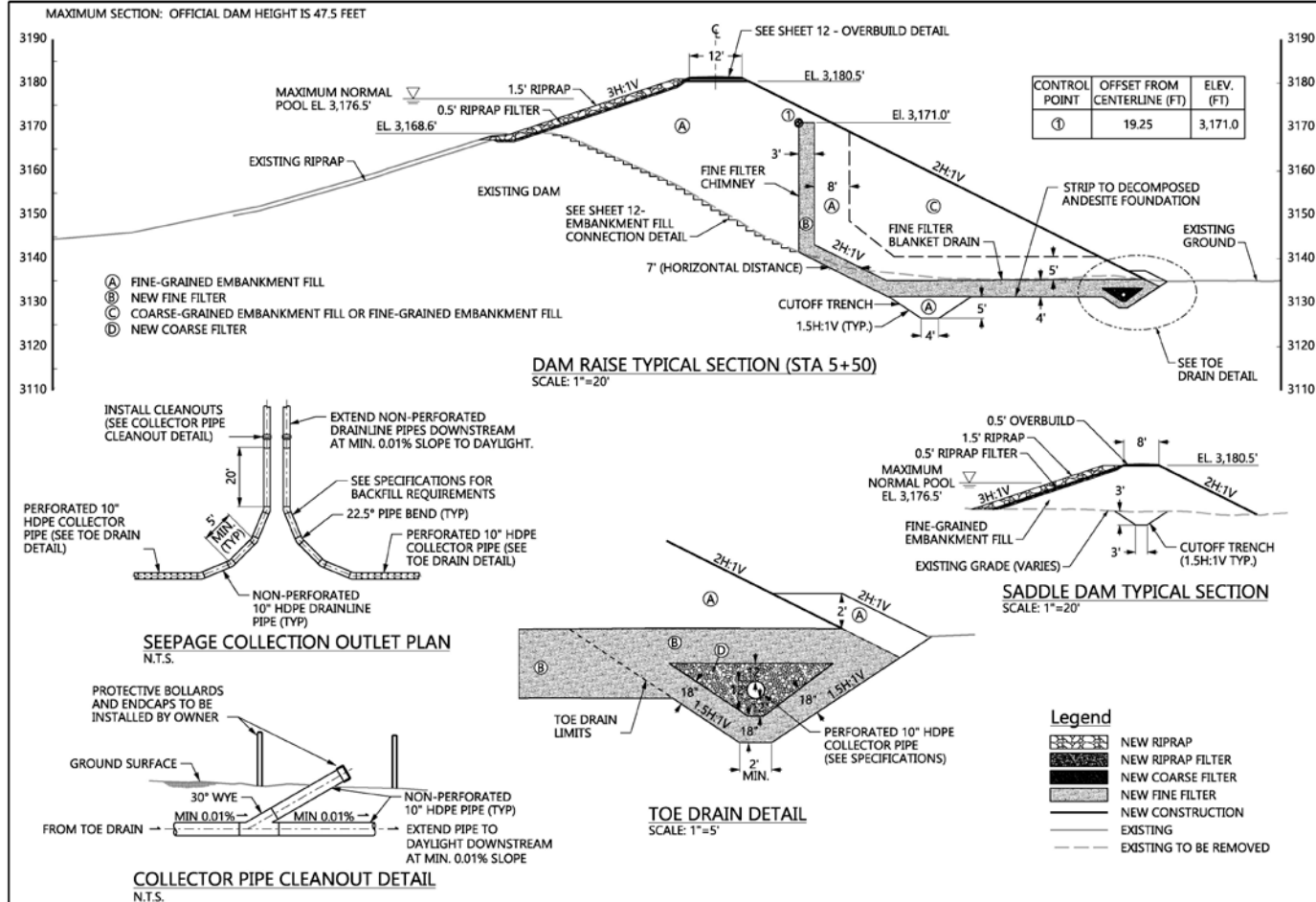
Emergency Action Plans (EAP)



- Recognize conditions
- Actions
- Inundation map
- Means to detect
- Responsible parties
- Notifications
- Required for High Hazard Dams
 - HB 3427 from 2017



Designs for New Dams



FARMERS IRRIGATION DISTRICT
UPPER KINGSLEY RES. ENHANCEMENT (PH-2)

EMBANKMENT TYPICAL SECTIONS

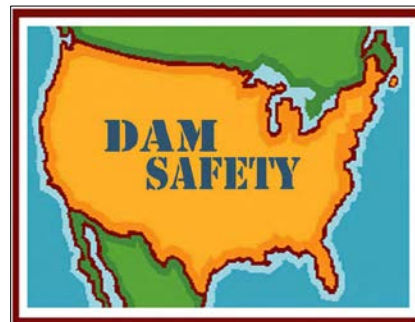
WPN Watershed Partnership Network, LLC
CORNFORTH CONSULTANTS

DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY

PROJECT NO. 2017-014
SHEET NO. 10 OF 15

2017 IWRS Edition

1. Modernize state laws to improve the safety and resiliency of Oregon dams
2. Resources to determine safety deficiencies; evaluate and retrofit



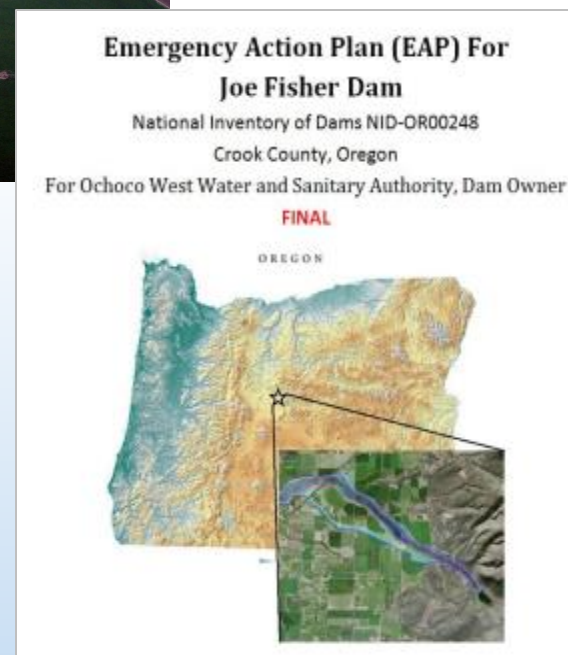
Weak fill, seismic, spillway, conduit

- 3. Authorize emergency actions and encourage cooperative actions to improve the safety of dams**
- 4. Properly decommission dams at the end of their useful life**

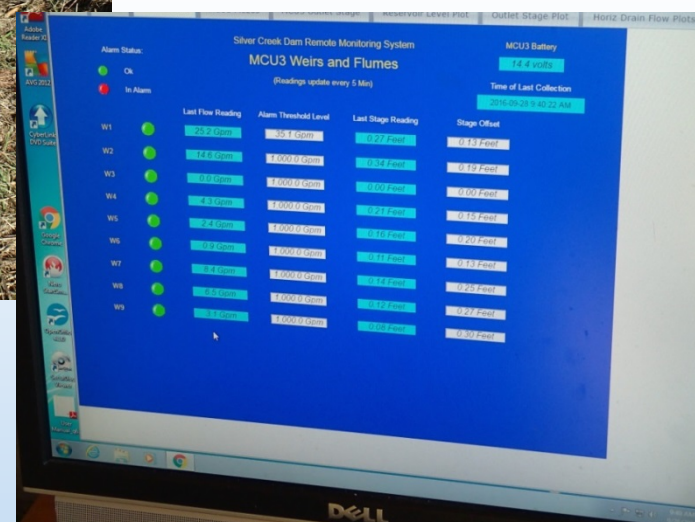


5. Coordinate emergency responses

6. Define the responsibilities of a dam owner

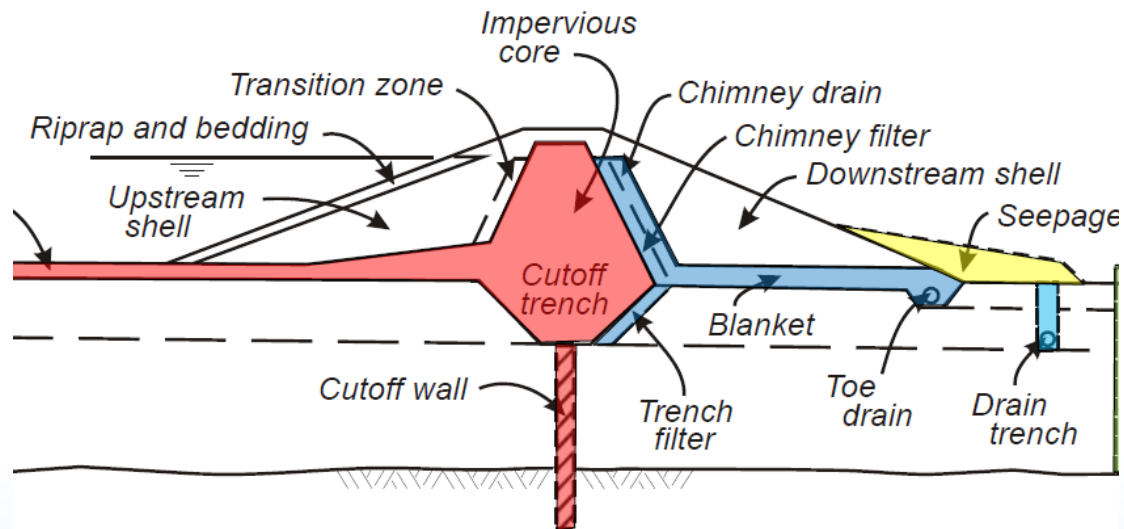


- Require remote monitoring on deficient high hazard dams
- Dam owners should prepare an EAP for high hazard dams



9. Authorize a fee for review of plans and specifications

10. Dedicate grant and loan resources for rehabilitation of deficient dams



Rehabilitated Dams

Barney Reservoir and Dam



McGuire Reservoir and Dam



Conclusions

- **Fairly good dam safety record**
- **Age and condition of Oregon's dams**
- **Potential for a major earthquake or flood or**
- **Specific actions in the event of an emergency**
- **Suggest revisions to dam safety statutes**
- **Will continue to work with stakeholders**
- **Statute proposal will be described later**