

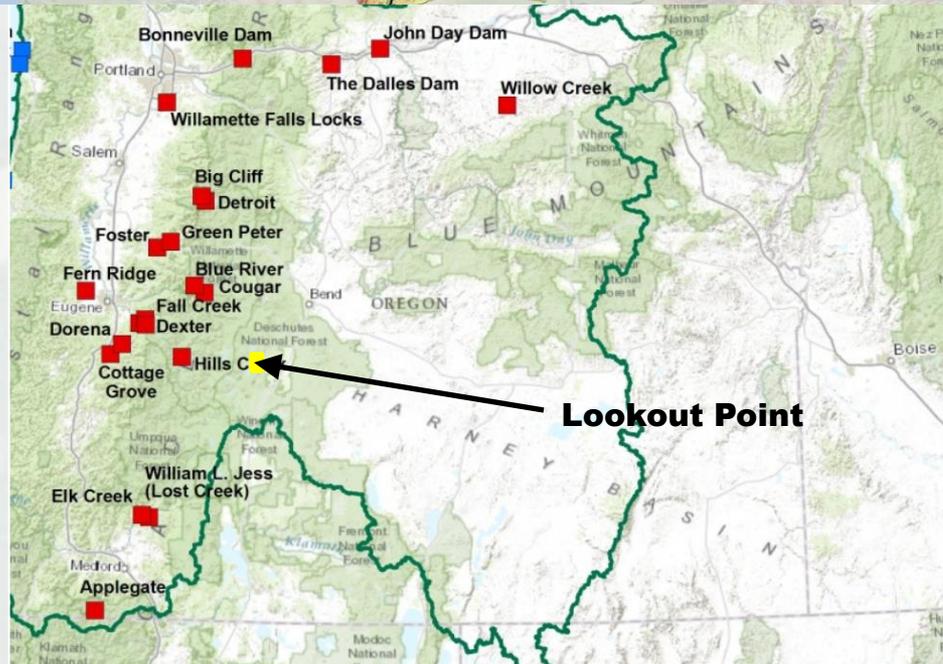
# Updating Emergency Action Plans: Lessons Learned

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Portland District Dam Safety Section

Oregon Dam Safety Conference  
February 10, 2015



# EAP: Lessons Learned



# EAP: Lessons Learned

- Audience:

Owners looking to create/update Emergency Action Plans

- Takeaways:

- 1. Guidelines/Resources
- 2. EAP Process
- 3. General Lessons Learned
- 4. Other Update Ideas



# Dam Safety

## TOP TEN

*with Doug Knapp*

# Dam Safety

## TOP TEN

*with Doug Knapp*

Things you might hear while updating an EAP

# Things you might hear while updating an EAP

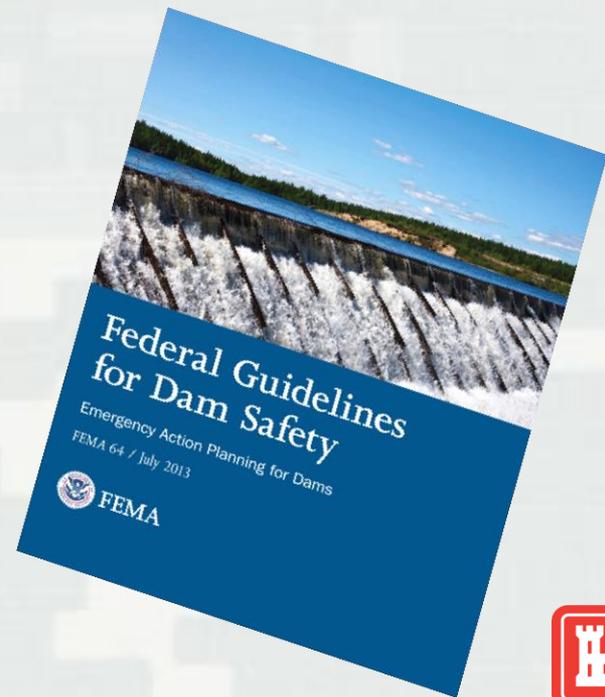
10.

# Before You Begin



# EAP Components

- Notification flowcharts
- Response process
- Responsibilities
- Preparedness activities
- Inundation maps
- Appendices as needed



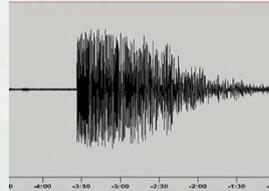
## Things you might hear while updating an EAP

10. “Is it bad if my latest version of the EAP is from 1988?”

9.

# EAP Process

Step 1:  
Detect Event



Step 2:  
Emergency  
Level

Level 1:  
High Flow

Level 2:  
Non-Failure

Level 3:  
Potential  
Failure

Level 4:  
Imminent  
Failure

Step 3:  
Notification

Level 1 List

Level 2 List

Level 3 List

Level 4 List

Step 4:  
Actions

Monitor,  
Save People

Monitor,  
Inspect

Save Dam

Save People

Step 5:  
Termination

Document,  
Notify Level 1

Document,  
Notify Level 2

Document,  
Notify Level 3

Document,  
Notify Level 4

## Things you might hear while updating an EAP

10. “Is it bad if my latest version of the EAP is from 1988?”
9. “I think 1 should be greater than 4.”
- 8.

# DSAT EAP Generator



**DSAT**  
Dams Sector Analysis Tool



US Army Corps  
of Engineers®



**FEMA**

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DOUG.KNAPP



DSAT Viewer



Consequence-Based Top Screen



Portfolio Prioritization Tool



Economic Consequence Assessment Model



Comprehensive Facility Report



Common Risk Model for Dams



ATPlanner - Dams Data Input Tool



Emergency Action Plans



Significant Incident Report



User Management Tool

# DSAT EAP Generator

WARNING: Data contained on this site is For Official Use Only



**DSAT**  
Dams Sector Analysis Tool



## Emergency Action Plan (EAP)

[About DSAT](#) [Resources](#) [Help](#) [Logout](#)

doug.knapp | Version 1.0

### Lookout Point Dam NID: OR00009

[Overview](#)

[Facility List](#)

▶ [1.0 EAP Overview](#)

▶ [2.0 General Project Information](#)

▶ [3.0 EAP Response Process](#)

▶ [4.0 Emergency Level Determination](#)

▶ [5.0 Notification & Communication](#)

▶ [6.0 Emergency Actions](#)

▶ [7.0 Event Termination and Follow-Up](#)

[8.0 Preparedness](#)

[9.0 Inundation Maps](#)

[10.0 Official EAP Distribution](#)

[11.0 EAP Maintenance](#)

▶ [Appendices](#)

[Concurrences](#)

[Preview Final EAP Report](#)

[EAP Submittal](#)

## 3.1 EAP Response Process

There are generally four steps that constitute the EAP response process that should be followed any time an Unusual or Emergency incident is detected at a dam. The steps include:

### — Step 1: Incident detection, evaluation, and classification of an emergency event by level

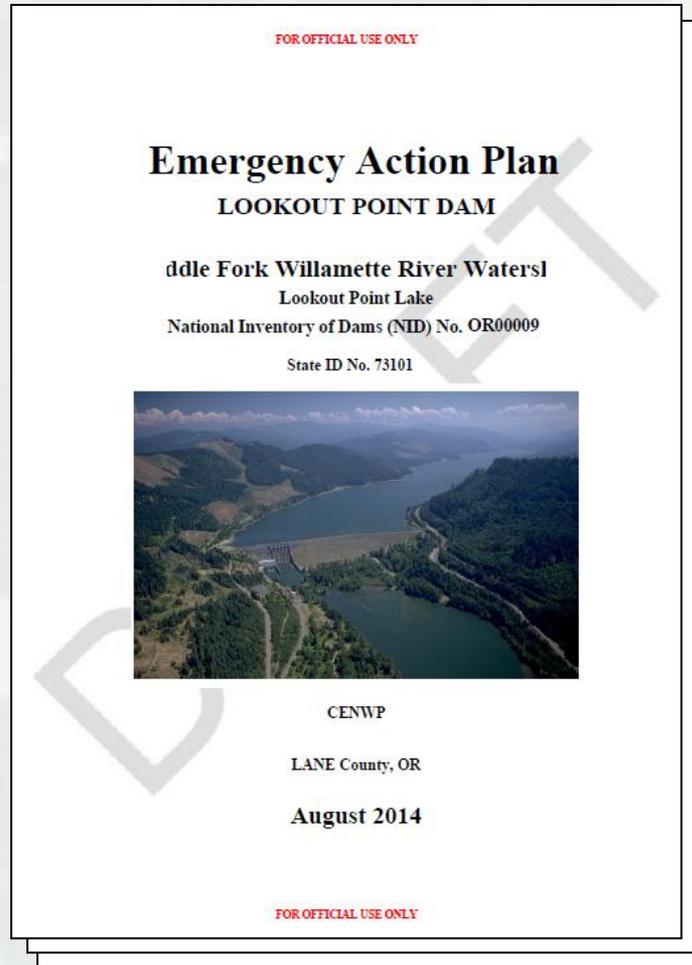
During Step 1, an unusual condition or incident is detected and confirmed. Unusual conditions or incidents are unique to each dam and, to the extent possible, should be identified in the EAP. After an unusual condition or incident is detected and confirmed, the dam owner will categorize the condition of incident into one of the established emergency levels based on the severity of the initiating condition or triggering events. Both the dam owner and emergency management authorities should understand the emergency levels and each other's expected responses. Consistency of the emergency level categories is recommended to eliminate confusion for emergency responders whose jurisdiction contains multiple dams and dam owners.

### — Step 2: Notification and communication

After the emergency level at the dam has been determined, notifications are made in accordance with the EAP's Notification Flowchart(s). Details on the use of the Notification Flowchart and any additional contact information should be provided in the EAP. When developing notification and communication procedures, dam owners should coordinate closely with emergency management authorities. All parties must understand that the formal declaration of public emergency by emergency management authorities can be a very difficult decision. During this step, the dam owner should provide any information that will assist in that decision. An early decision and declaration are critical to maximizing available response time. When performing notification and communication activities, it is important that people speak in clear, nontechnical terms to ensure that those being notified understand what is happening at the dam, what the current emergency level is, and which actions to take. To assist in this step, the EAP may include checklists and/or prescribed messages to help the caller adequately describe the emergency situation to emergency management authorities. Different messages can be developed for each emergency level.

### — Step 3: Emergency Actions

# DSAT EAP Generator

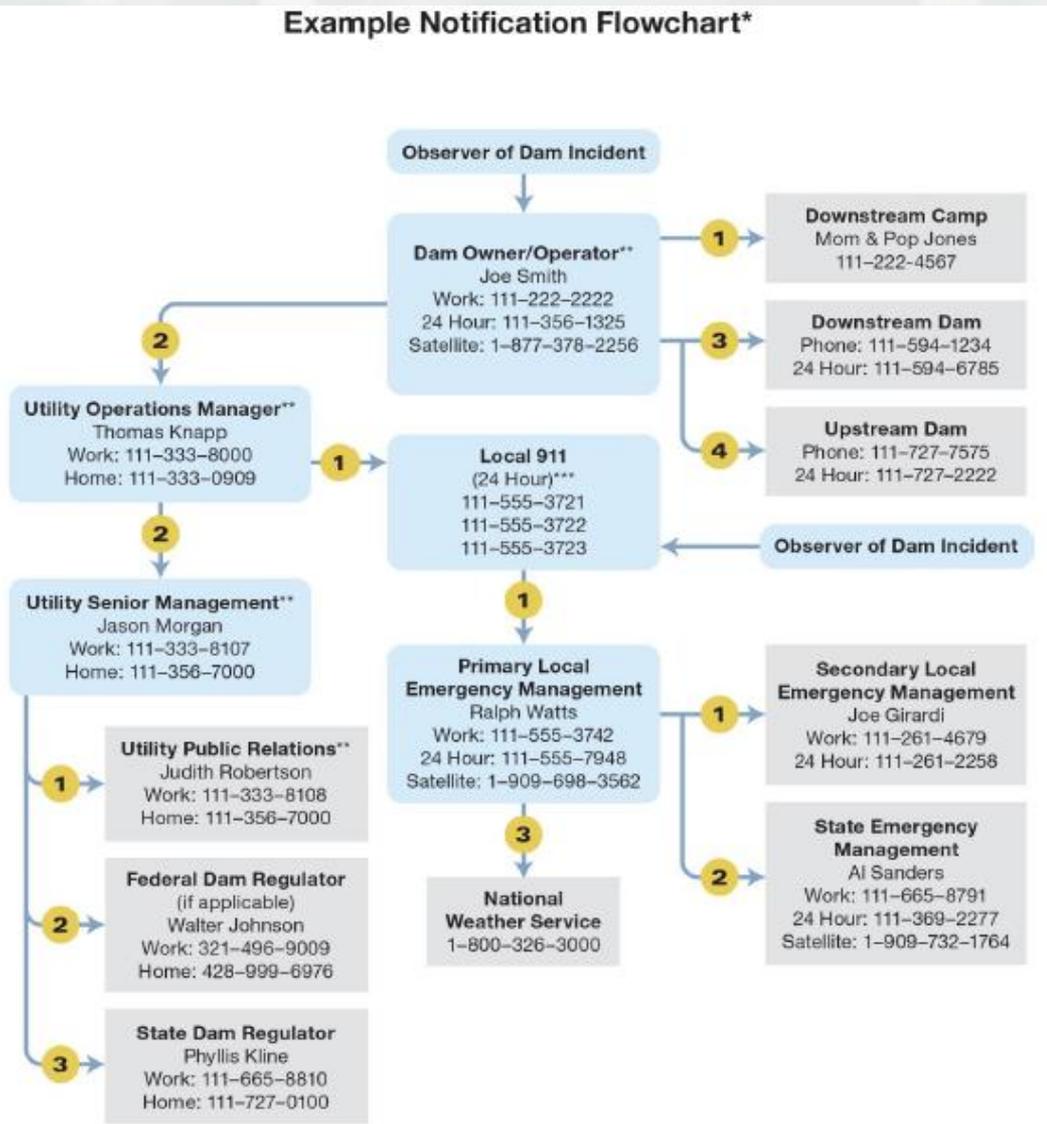


## Things you might hear while updating an EAP

10. “Is it bad if my latest version of the EAP is from 1988?”
9. “I think 1 should be greater than 4.”
8. “Is there an app for that?”
- 7.

# Notification Lists – Lessons Learned

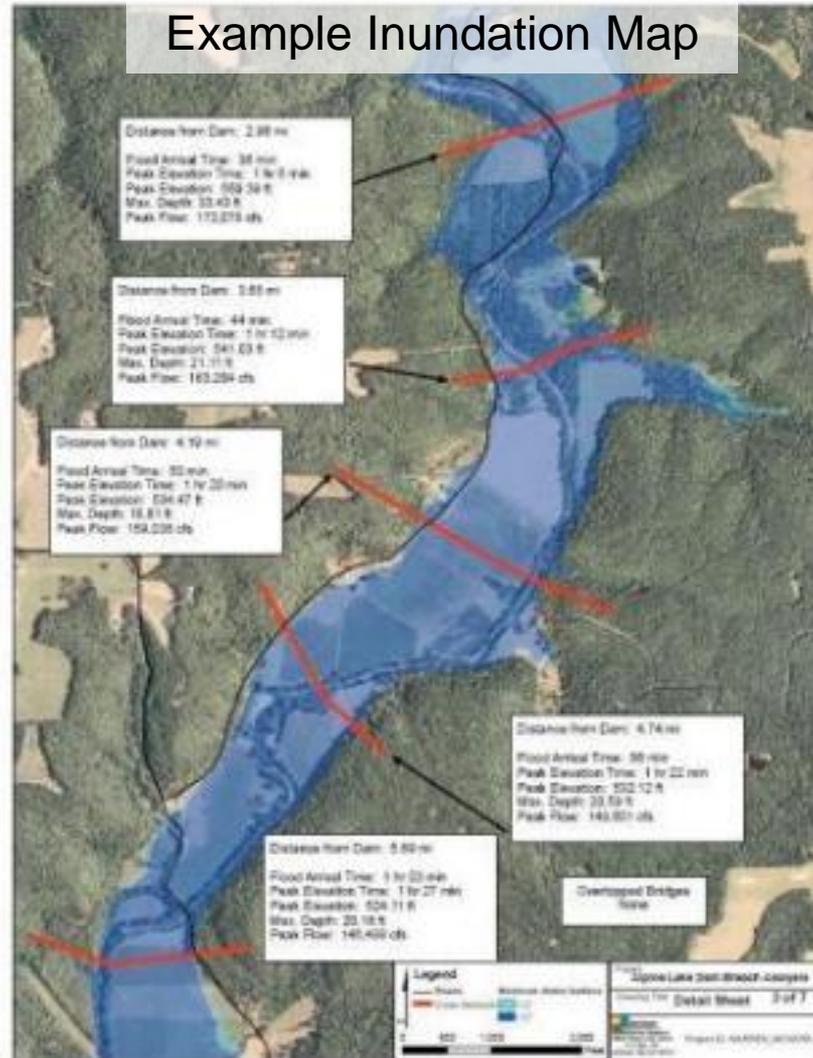
Example Notification Flowchart\*



## Things you might hear while updating an EAP

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7. “If the phones are down, go five blocks east on Market Street to Fire Station #12, use the red phone on the west side of the building to talk to dispatch.”
- 6.

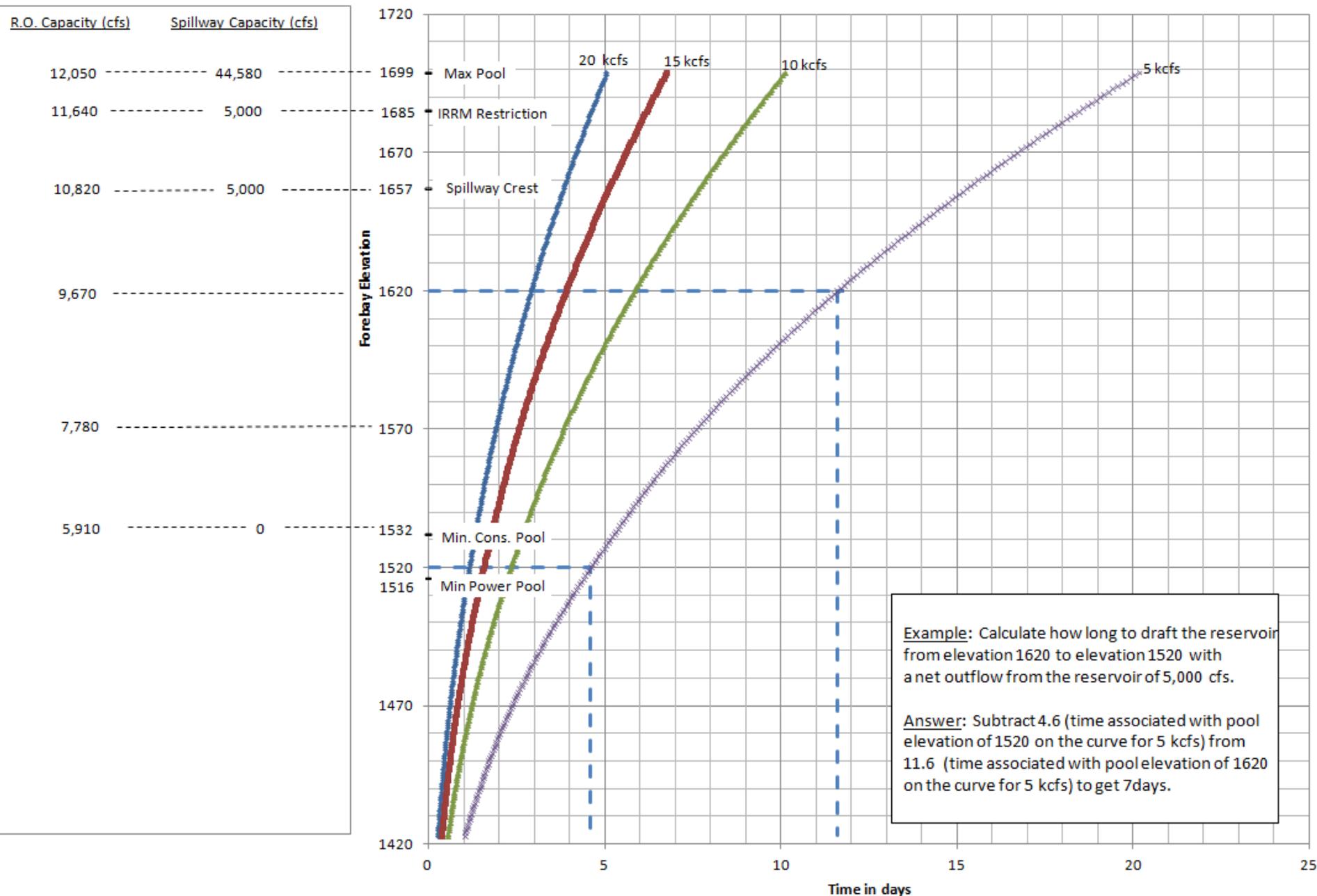
# Inundation Maps – Lessons Learned



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6. “There are no evacuation routes on these inundation maps.”
- 5.

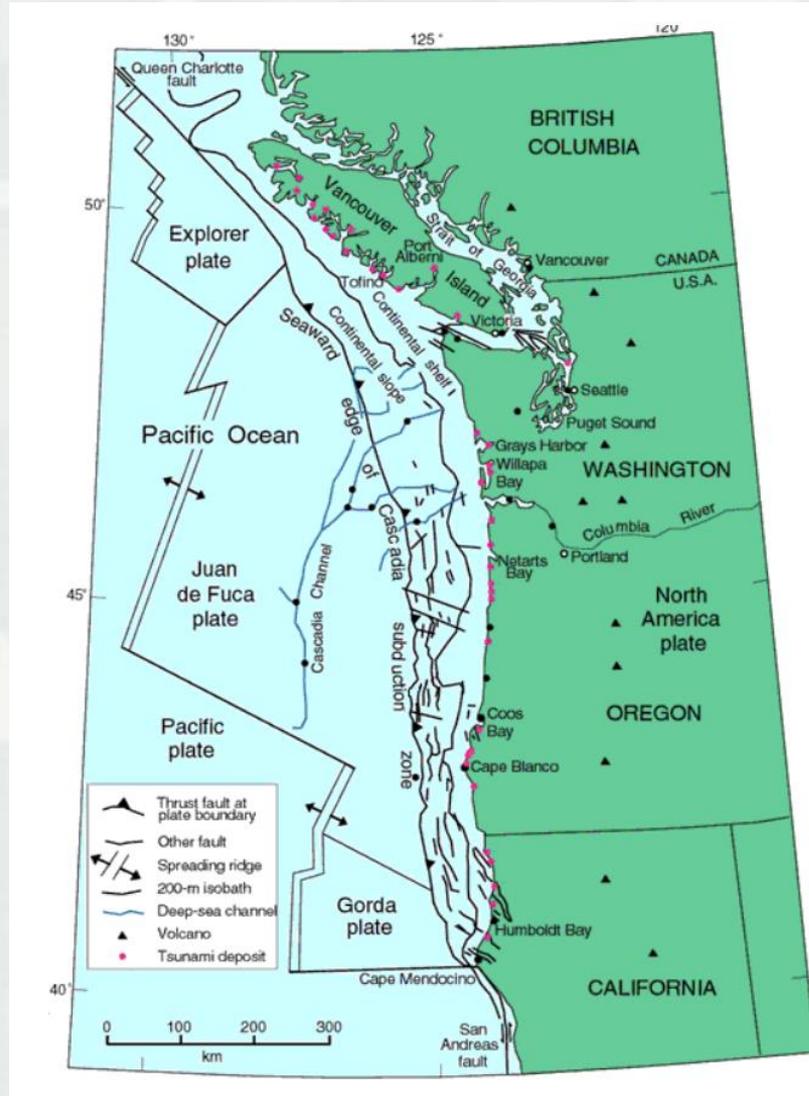
# Other Update Ideas: Pool Drawdown



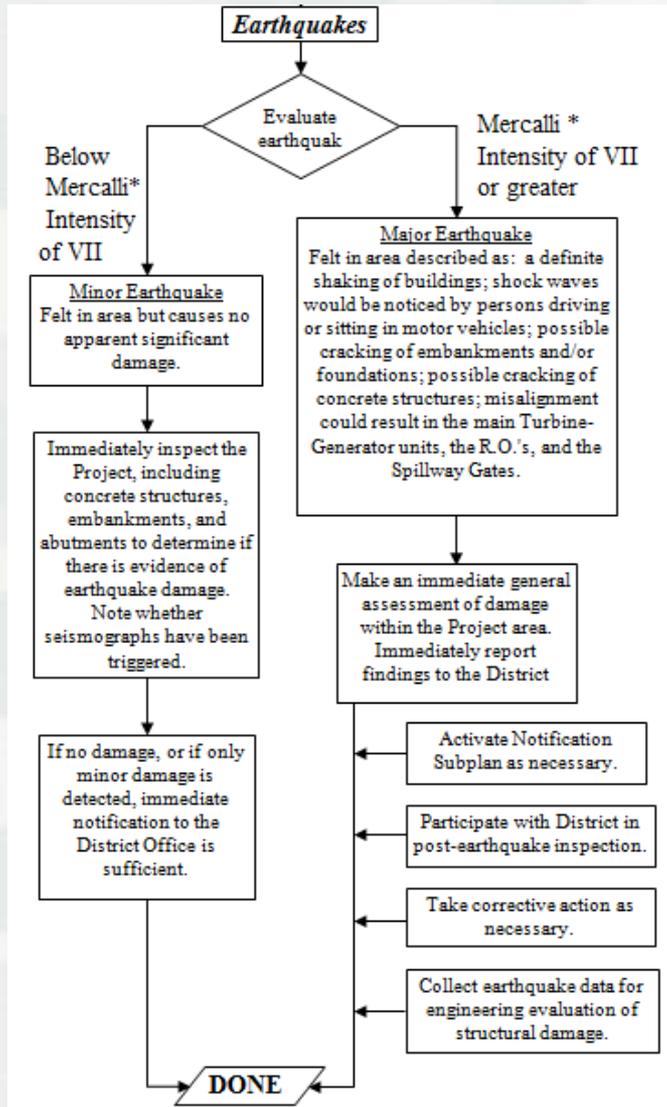
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6. “There are no evacuation routes on these inundation maps.”
5. “Did you say drool, paw, down?”
- 4.

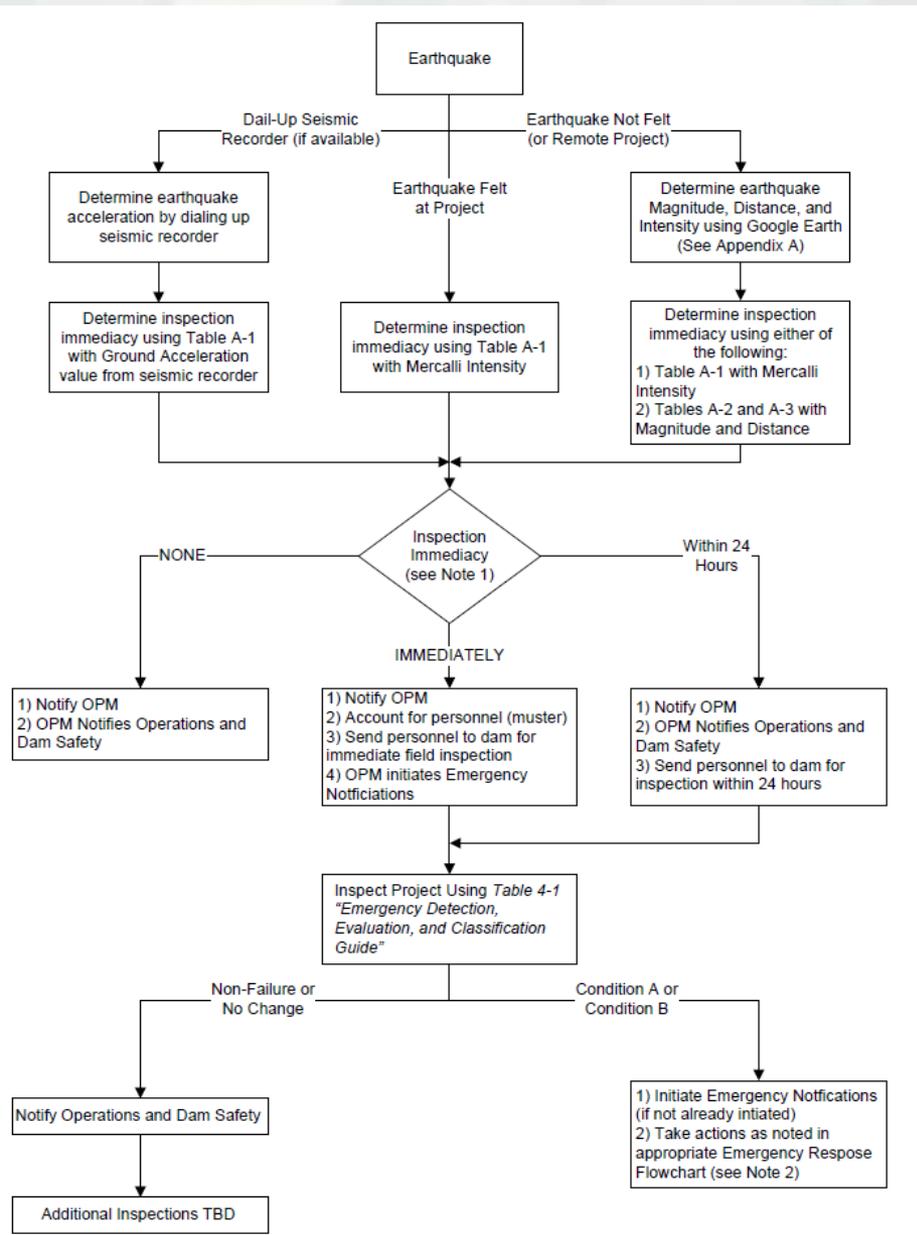
# Other Update Ideas: Earthquake Response



# Earthquake Response



\* For a complete listing of the Modified Mercalli Intensity Scale (MMI) for physically evaluating earthquake intensities, see Section 11.6.3.5 of the Emergency Action Plan.



# Earthquake Response

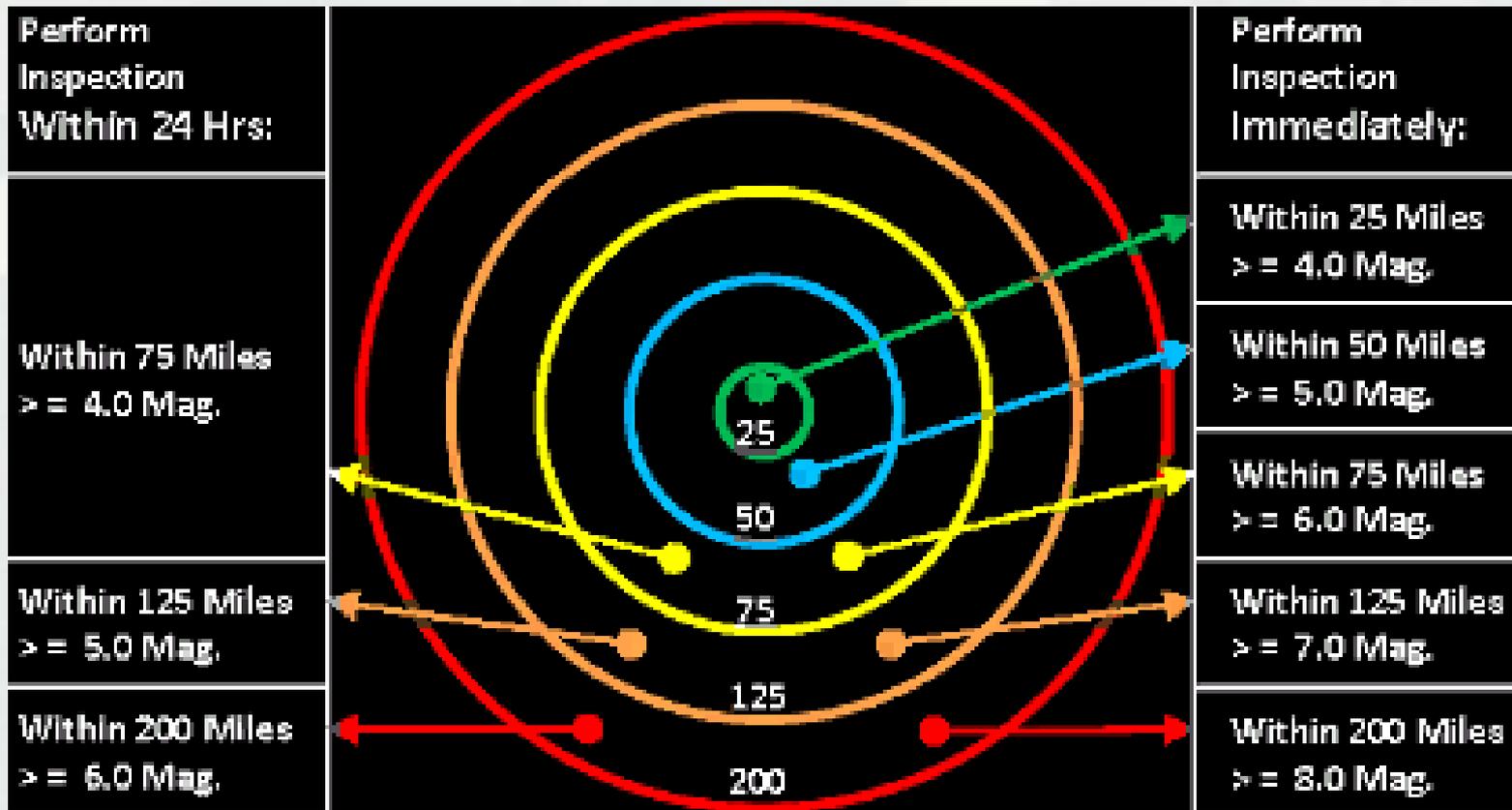
11.4.1.1.2.2 Special post-earthquake inspections are to be conducted if the ground motion is felt at the dam or in accordance with the following earthquake magnitude and epicenter distance from the dam criteria.

Earthquake Magnitude	Epicenter Distance From the Dam (Miles) (Inspect dam if epicenter is within this distance to the dam.)
4.5	10
5.0	50
<del>6.0</del> 4*	<del>75</del> 25*
7.0	125
8.0	200

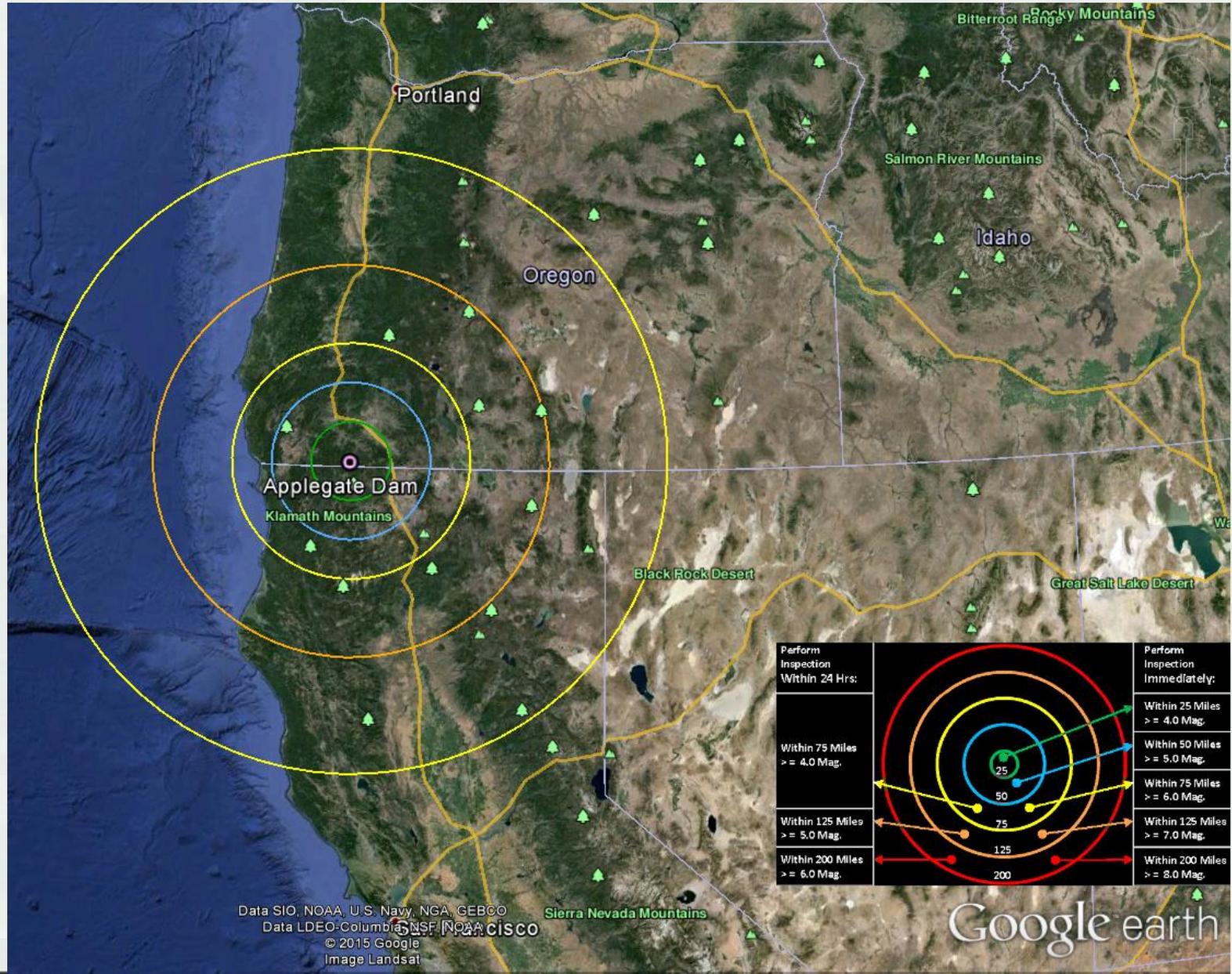
\*Portland District using Magnitude 4 and 25 miles based on USSD document – more conservative



# Earthquake Response



# Earthquake Response



# Earthquake Response

2 Embankment Crest and Unpaved Roadway				
A	Cracking along the dam axis (longitudinal) or across the axis (transverse)?		X	None noted. See photos 1 and 2 for general conditions.
B	Misalignment of walls, parapets, guardrails, posts etc.?		X	None noted.
C	Crest arching or bowing?		X	None noted.
D	Low areas, depressions, erosion, or ruts?		X	None noted.
E	Trees/Vegetation in noncompliance of the Vegetation Control Plan (VCP)?	X		Occasional bushes need to be removed per the Vegetation Control Plan.
F	Other?			X
3 Embankment Upstream Slope				
A	Sloughing, displaced, or missing slope protection (Rip-rap)?		X	None noted. See photos 3 and 4 for general conditions.
B	Trees/Vegetation in noncompliance of the VCP?	X		Vegetation (bushes) noted near crest near Station 23+00 (photo 5).
C	Animal burrows or holes?		X	None noted.
D	Other?			X



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6. “There are no evacuation routes on these inundation maps.”
5. “Did you say drool, paw, down?”
4. “Cascadia Subduction Zone.”
- 3.

# Earthquake Response - Example

The image shows a composite screenshot of the USGS Earthquake Notification Service (ENS) website. On the left, a map editor interface is visible with the text "Define a polygon boundary" and a map of the United States and Mexico. A green polygon is drawn around the Vancouver, British Columbia area. On the right, the main website content is displayed, including the USGS logo, navigation menu, and the "Earthquake Notification Service" section. Below the main content, an "Advanced Editing Options" form is shown with the following fields:

- Edit as XML:** Edit
- Name for this Profile:** NWP
- Day Magnitude:** 4.000
- Night Magnitude:** 4.000
- SUBMIT**

The website header includes the USGS logo and navigation links: Home, About Us, Contact Us, Search USGS. The main navigation menu includes: EARTHQUAKES, HAZARDS, LEARN, PREPARE, MONITORING, RESEARCH. The "Earthquake Notification Service" section features a "2.5 Mod - SAN FRANCISCO BAY AREA, CALIF." notification example and a "Manage Your Account" section with fields for Username and Password, and links for "Forgot username/password", "Sign up for ENS", and "Unsubscribe from ENS".

# Earthquake Response - Example

[EXTERNAL] 2014-03-10 05:18:12 (M6.1) OFFSHORE NORTHERN CALIFORNIA 40.8 -125.1 (6480b)

USGS ENS [ens@ens.usgs.gov]

You forwarded this message on 3/13/2014 12:49 PM.  
This message was converted to plain text.

Sent: Sun 3/9/2014 10:34 PM

To: Chase, Matthew T NWP

Globe with Earthquake Location <<http://earthquake.usgs.gov/earthquakes/eventpage/nc72182046#maps>>

M6.1 - OFFSHORE NORTHERN CALIFORNIA

Preliminary Earthquake Report

Magnitude 6.1

Date-Time

- \* 10 Mar 2014 05:18:12 UTC
- \* 9 Mar 2014 21:18:12 near epicenter
- \* 9 Mar 2014 21:18:12 standard time in your timezone

Location 40.821N 125.128W

Depth 7 km

Distances

- \* 77 km (47 mi) WNW of Ferndale, California
- \* 81 km (50 mi) W of Eureka, California
- \* 85 km (52 mi) WNW of Fortuna, California
- \* 87 km (53 mi) W of McKinleyville, California
- \* 398 km (246 mi) NW of Sacramento, California

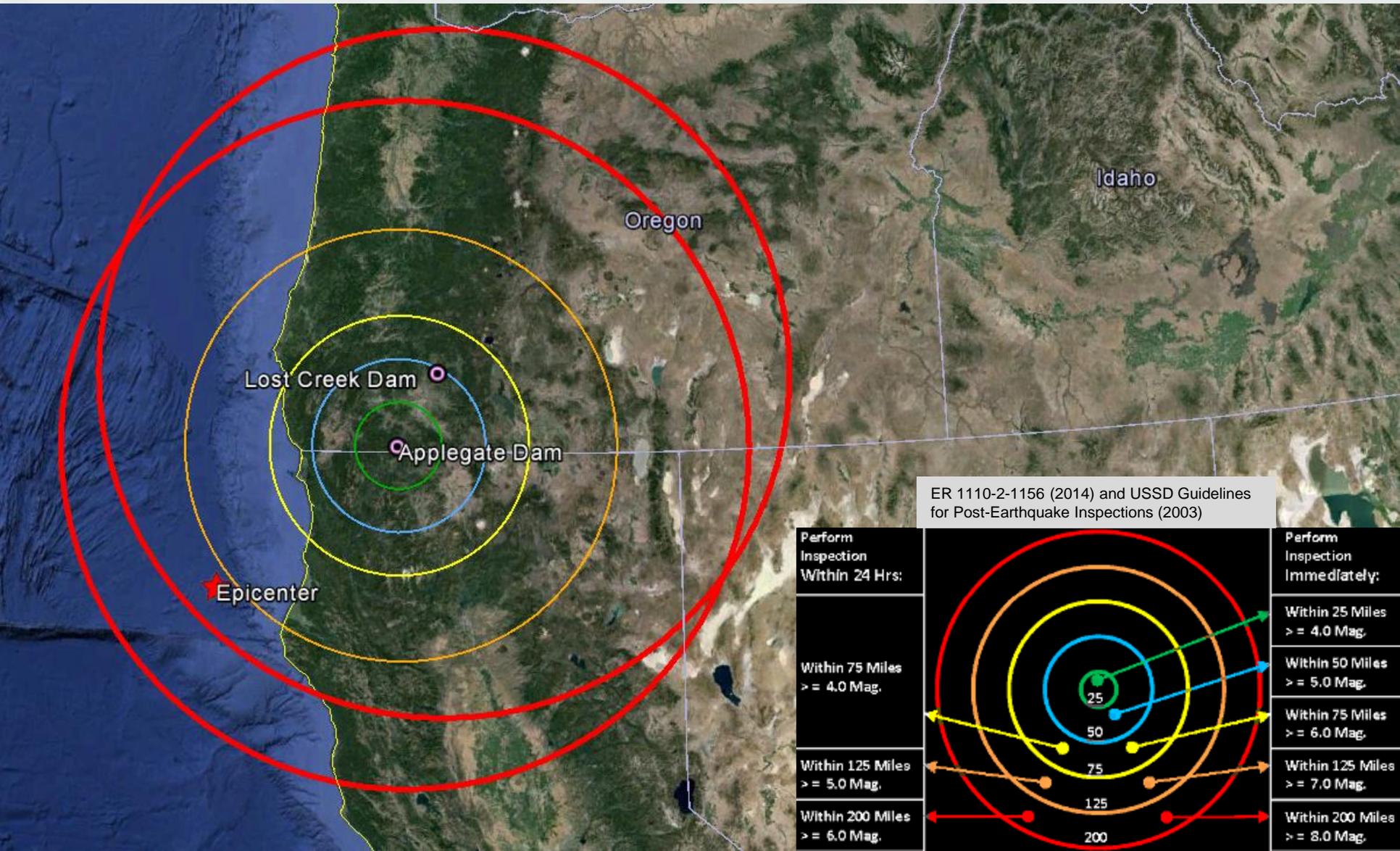
Location Uncertainty Horizontal: 0.9 km; Vertical 25.2 km

Parameters Nph = 186; Dmin = 90.3 km; Rmss = 0.29 seconds; Gp = 226°

Version = 3

Event ID nc 72182046

# Earthquake Response - Example



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6. “There are no evacuation routes on these inundation maps.”
5. “Did you say drool, paw, down?”
4. “Cascadia Subduction Zone.”
3. “If you are ever lonely, sign up for the USGS earthquake notification service and set the lower tolerance to a magnitude 3.0.”
- 2.

# Other Update Ideas – Condensed EAPs

- Condensed EAP
  - Description of emergency levels
  - Notification flowcharts
  - Inundation maps
  - Relevant responsibilities
- In-house EAP
  - Project description
  - Upward notification
  - Stockpiling of supplies and equipment
  - Dam owner responsibilities



## Things you might hear while updating an EAP

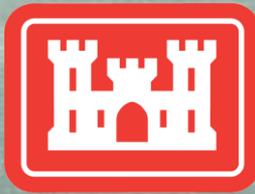
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5. “Did you say drool, paw, down?”
4. “Cascadia Subduction Zone.”
3. “If you are ever lonely, sign up for the USGS earthquake notification service and set the lower tolerance to a magnitude 3.0.”
2. “I just need the maps and the flowcharts. You can have the rest of this back.”
- 1.

# EAP Maintenance

- Review EAP annually
- Update contact information
- Exercise the EAP
- Track versions and copies



# Thank you!



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