

LUCKY PEAK DAM SAFETY

MANAGING FLOOD RISK IN THE TREASURE VALLEY

LTC RICK CHILDERS, P.E.
WALLA WALLA DISTRICT
COMMANDER

WALLA WALLA DISTRICT
NOVEMBER 2021

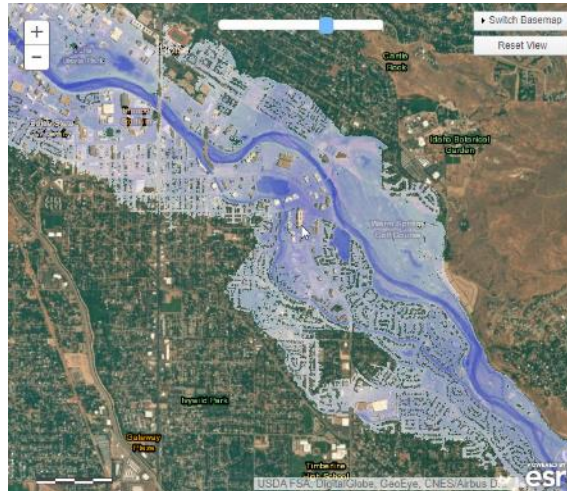


US Army Corps
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Walla Walla District



AGENDA

- Introductions
- Flood Risk on the Boise River
- The USACE Dam Safety Program
- The National Inventory of Dams
- Q&A and Discussion



FLOOD RISK ON THE BOISE RIVER

Tracy Schwarz, P.E., PMP
Flood Risk Manager
Walla Walla District



RISK FACTORS FOR FLOODING

Significant risk despite three large reservoirs upstream (Lucky Peak, Arrowrock, and Anderson Ranch Dams)

- Large runoff volumes
- Late season rainstorms
- Irrigation withdrawals may not be significant during peak flood flows
- Dam Failure
- **River flooding is one of the biggest and most likely hazards Ada and Canyon Counties face!**



RISK – INCREASING POPULATION IN THE FLOODPLAIN

1943 Flood – 25,000 cfs (pre-Lucky Peak)

Development has increased dramatically



1943 – Flood in Eagle, Idaho



2020 – Present Development, Eagle, Idaho

THE BOISE RIVER KEEPS FLOODING... EVEN WHEN THE DAM IS PROPERLY FUNCTIONING

Floods as measured at Glenwood

- Since 1982, the Glenwood Gage has been above 7,000 cfs (flood stage) 11 times.
- 2017 – 9,590 cfs
- 2012 – 8,310 cfs
- 1998 – 8,350 cfs
- 1986 – 8,030 cfs
- 1983 – 9,840 cfs

Big Floods

- 1-percent flood (100 year) - 16,600 cfs
- 0.2-percent flood (500 year)– 34,800 cfs
- **Big Floods are more likely than Dam Failure**



WHAT IS BEING DONE TO BETTER UNDERSTAND AND REDUCE FLOOD RISK

- Hazard Mitigation Plans
- Local emergency plans
- National Weather Service (NWS) Advanced Hydrologic Predictive Service (AHPS) Webpage
- Updated FEMA Flood Insurance Rate Maps
- 2019 LiDAR and Boise River 2D Model (FCD10 and USACE)
- Garden City study
- Publicly Available Inundation Maps



From AHPS Webpage

Partnerships and shared responsibility

USACE DAM SAFETY PROGRAM

Marcus Palmer, P.E.
Engineering Design Branch Chief
Walla Walla District





Periodic Inspections

Annual Inspections



Risk Assessments

USACE DAM SAFETY PROGRAM

Dam Safety Training



Emergency Action Plan
Lucky Peak Dam

EAP Updates & Exercises

Operations & Maintenance

Instrument Monitoring



Public safety is our highest priority!

DEFINING DAM RISK

HAZARDS

- What are the hazards?
- How often and how severe?
- What are conditions at the dam?

RISK

CONSEQUENCES

- Who is downstream?
- What may flood?
- How much warning time?

PERFORMANCE

- How will the dam respond?
- How likely to perform satisfactorily?
- What can go wrong?



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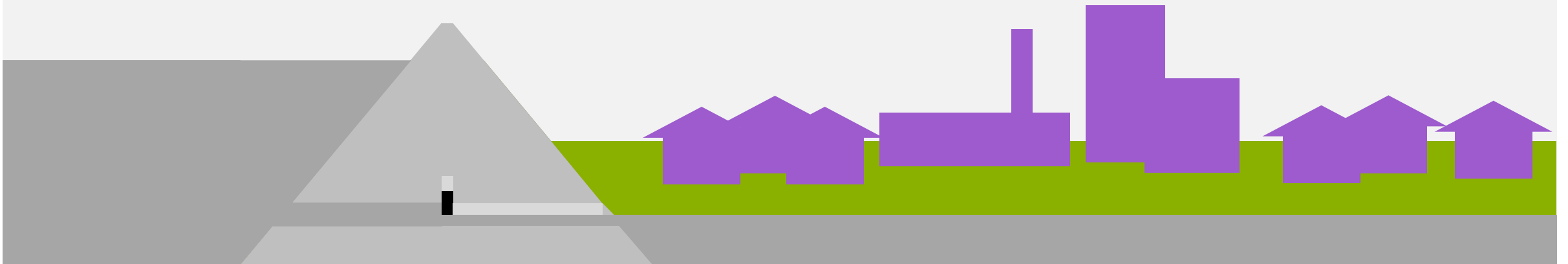
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RISK = LIKELIHOOD X CONSEQUENCES

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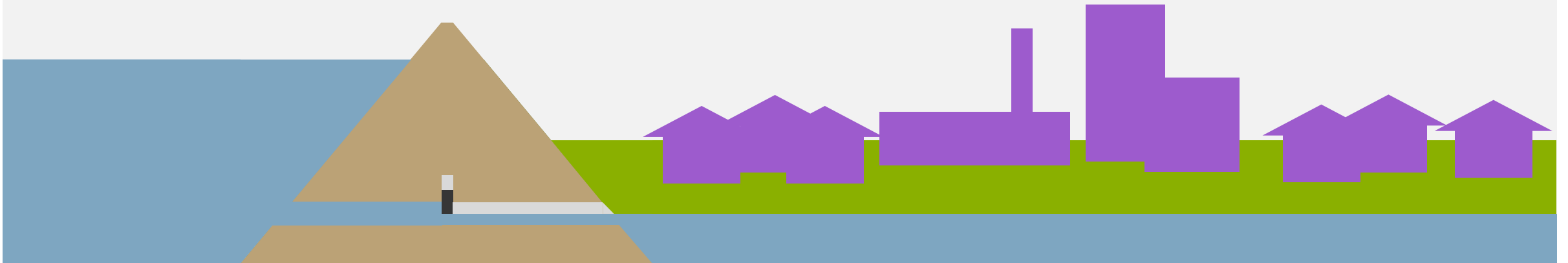
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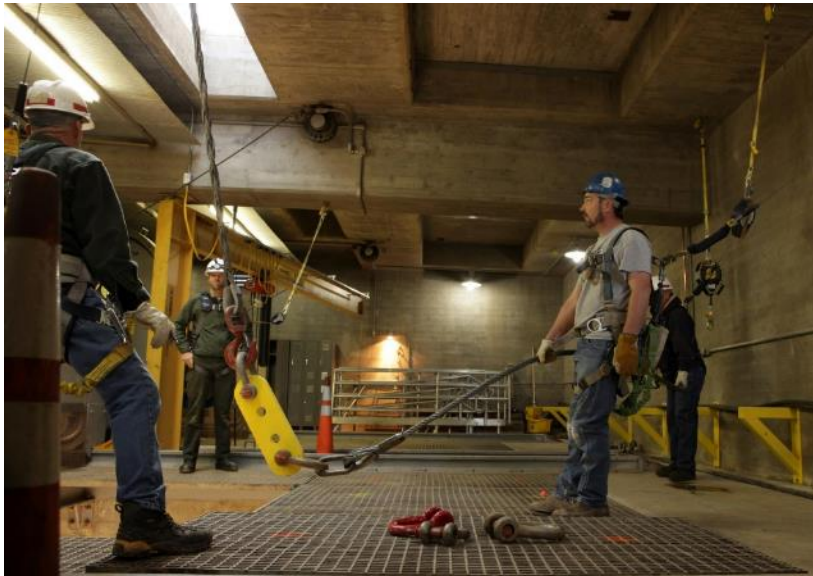
DAM SAFETY RISK ASSESSMENT IN THE BOISE BASIN

Lucky Peak Dam

- Periodic Inspections
 - Every 5 years, last in 2019
- Periodic Assessments
 - Every 10 years, last in late 2020

Findings of Most Recent PA

- We have high confidence that Lucky Peak Dam is in good shape performing very well
- We also updated our consequence model, and we now estimate the consequences to be much higher than the Initial Risk Assessment



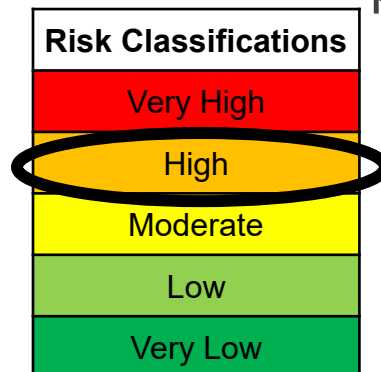
DAM SAFETY ACTION CLASSIFICATION

What are Risk Classifications?

- In 2005, USACE began screening levees and dams across the enterprise to identify and classify the highest risk dams requiring urgent or compelling action.
- Risk Classifications provide consistent and systematic guidelines for actions to address deficiencies.
- Risk Classifications prioritizes dam systems for further actions.

What about Lucky Peak?

- Lucky Peak Dam was originally classified as a Moderate Risk dam in 2010.
- As a result of the 2020 PA, Lucky Peak is being reclassified as a High Risk dam.
- This change is primarily due to the updated consequence estimation.
- This means Lucky Peak will have a higher priority for funding to examine risk drivers and potentially identify risk reduction measures.



WHAT COMES NEXT FOR LUCKY PEAK?

Actions we'll take as a result of change in Risk Classification:

- Initiate an Issue Evaluation Study to further evaluate the dam and better quantify the existing risk for the system.
- Update our emergency action plan (EAP) and share it with our emergency management partners.
- Conduct an emergency exercise in 2022.

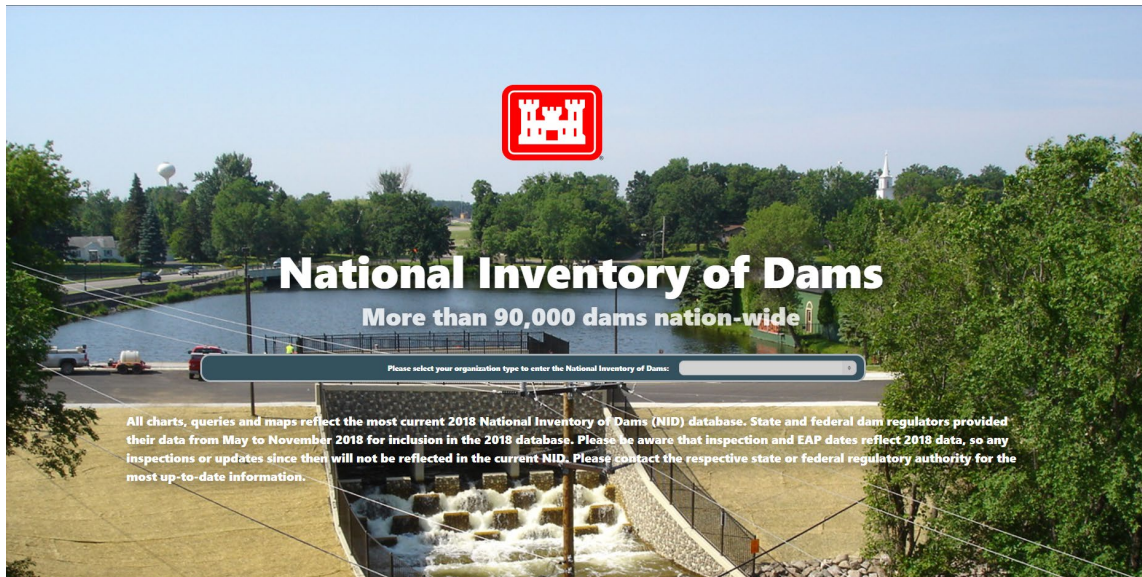
Risk Assessments
SPRA - Screening Risk Assessment
PA – Periodic Assessment
IES - Issue Evaluation Study
DSMS - Dam Safety Modification Study



USACE INUNDATION MAPS

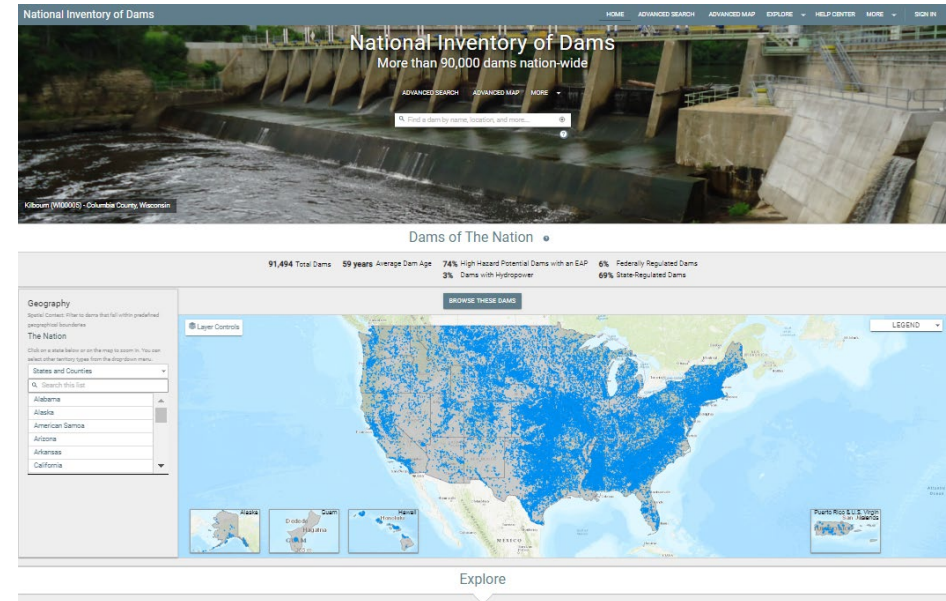
Where it Started.

- Static Map Books
- For Official Use Only
- National Inventory of Dams
- <http://nid.sec.usace.army.mil>



Where it's going in the future

- Updated National Inventory of Dams
- Publicly Viewable
- Dynamic inundation maps (breach and non-breach)



INUNDATION MAPS ARE COMING – LUCKY PEAK (2020)



Normal High Pool – Breach Scenario

KEY TAKEAWAYS

- After the construction of Lucky Peak Dam, the likelihood of flooding on the Boise River was reduced substantially, but still exists.
- The Dam was well constructed and is in good condition.
- The likelihood of failure is very low but the downstream consequences of failure drive the risk to “High”.
- The recent change in Dam Safety Action Classification from “Moderate” to “High” will prioritize Lucky Peak Dam for further study over the next few years.
- USACE will continue to work with local emergency managers to minimize potential consequences and maximize preparedness.

QUESTIONS AND DISCUSSION

