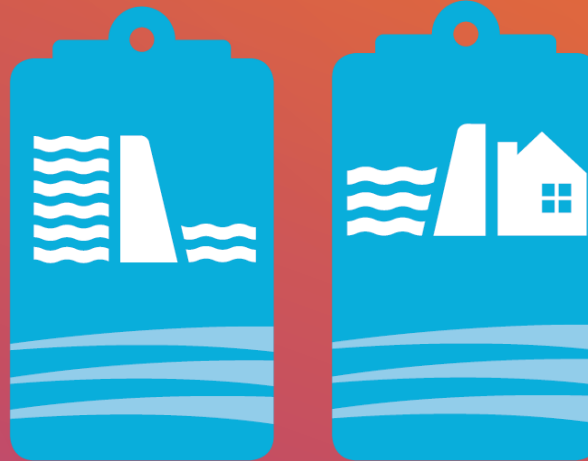


2025 Report Card for America's Infrastructure

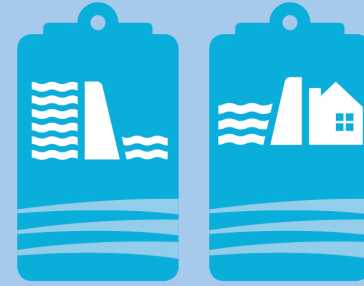
Dams & Levees



August 26, 2026

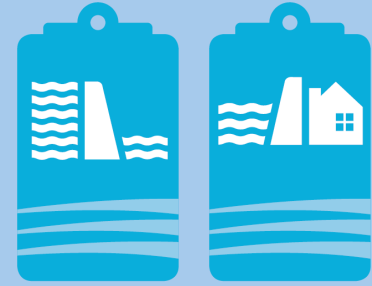


Agenda



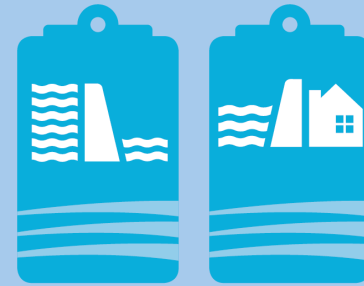
- Overview of ASCE Report Card
- Panel Perspectives
 - ASDSO Roadmap to Reducing Dam Safety Risks (John Roche)
 - Improving Levee Safety (Mike Bachand)
 - Improving Dam Safety (Bill Foos)
 - Case Studies (Dan Wade)
- Questions and Answers

Housekeeping Items



- Webinar is being recorded
- Recording and slides will be made available
- Attendee input via typed questions
- Send any technical issues/questions through the chat function

Panelists



Del Shannon

ASCE Committee on
America's Infrastructure



John Roche

President,
Association of State Dam
Safety Officials



Mike Bachand

Senior Engineer,
Water Practice Leader,
GEI Consultants



Bill Foos

Vice President,
U.S. Society on Dams



Dan Wade

Senior Vice President,
GEI Consultants





ASCE
2025 REPORT CARD
FOR AMERICA'S INFRASTRUCTURE

2025 Report Card for America's Infrastructure

	AVIATION	 D+		PARKS AND RECREATION	 C-
	BRIDGES	C		PORTS	 B
	BROADBAND	 C+		RAIL	 B-
	DAMS	 D+		ROADS	 D+
	DRINKING WATER	 C-		SCHOOLS	D+
	ENERGY	 D+		SOLID WASTE	C+
	HAZARDOUS WASTE	 C		STORMWATER	D
	INLAND WATERWAYS	 C-		TRANSIT	 D
	LEVEES	 D+		WASTEWATER	D+

America's
Cumulative
Infrastructure
Grade



A EXCEPTIONAL

B GOOD

C MEDIOCRE

D POOR

F FAILING

What the Grades Mean



MEDIOCRE

Requires attention



EXCEPTIONAL

Fit for the future



POOR

At risk



GOOD

Adequate for now



FAILING/CRITICAL

Unfit for purpose

Methodology

CAPACITY

OPERATION AND MAINTENANCE

CONDITION

PUBLIC SAFETY

FUNDING

RESILIENCE

FUTURE NEED

INNOVATION

Investment Gap

Infrastructure System	TOTAL NEEDS	FUNDED	FUNDING GAP
AVIATION	\$310	\$197	\$113
BRIDGES	\$538	\$165	\$373
BROADBAND	\$61	\$61	\$0
DAMS	\$185	\$20	\$166
DRINKING WATER	\$670	\$361	\$309
ENERGY	\$1,886	\$1,308	\$578
HAZARDOUS & SOLID WASTE	\$162	\$146	\$16
INLAND WATERWAYS & PORTS	\$45	\$32	\$13
LEVEES	\$97	\$7	\$91
PUBLIC PARKS	\$106	\$62	\$44
RAIL	\$145	\$113	\$32
ROADS	\$2,233	\$1,549	\$684
SCHOOLS	\$1,100	\$671	\$429
TRANSIT	\$618	\$466	\$152
WASTEWATER + STORMWATER	\$983	\$293	\$690
TOTALS	\$9,139	\$5,450	\$3,689

\$3.7
Trillion
needed

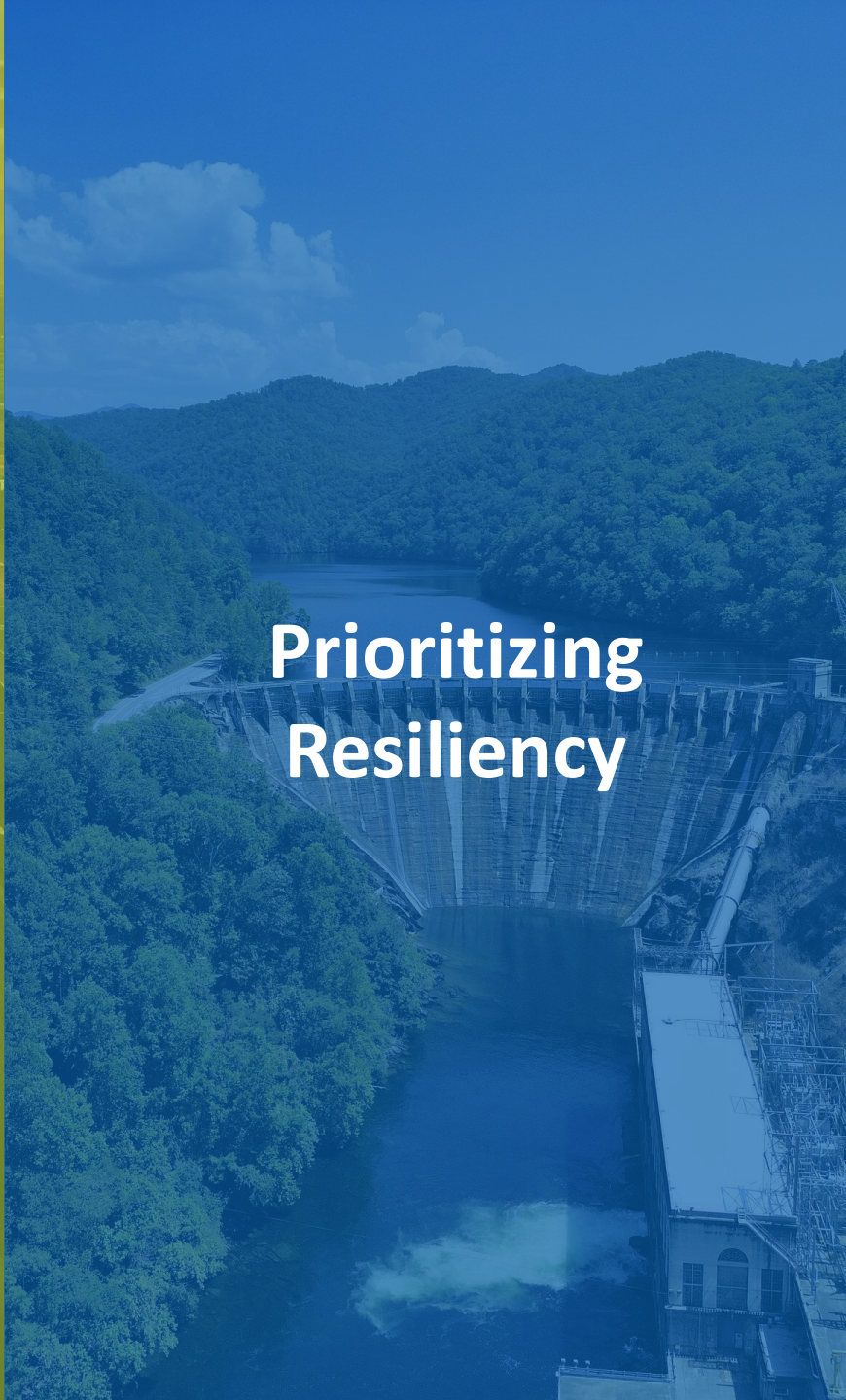


CURRENT
FUNDING

FUNDING
GAP



**Sustaining
Investment**



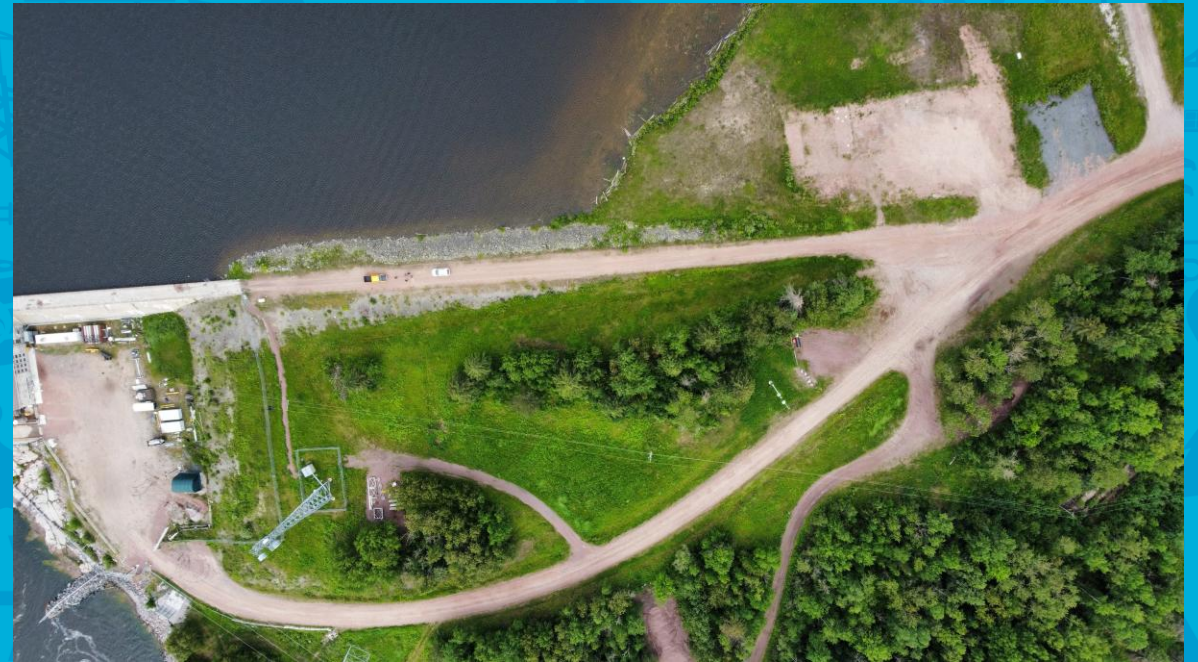
**Prioritizing
Resiliency**



**Advancing Policy
& Innovation**

Importance of Dams + Levees to National Infrastructure

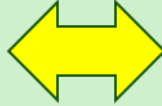
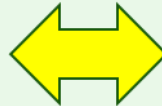
- Dams and levees are critical infrastructure
- Grades improved, but more work ahead
- Dams: one of five base chapters of ASCE state report cards



Grading Dams

2021 Grade = D+

2025 Grade = D+

Criteria	Change	Why?
Capacity		There are a total of 92,366 dams in the U.S. total High Hazard Potential Dams: 16,708 this is an approximate increase of 1,100 from 2019.
Condition		The average age of dams in the U.S. is 63 years. The nations dams are in significant need of repair, 7 out of 10 dams are older than 50 years as 2025. Increased climate events are exacerbating strain on aging infrastructure.
Funding		The IIJA provided nearly \$3.1 billion for dam safety. Hydropower generation provided a boost through tax credits in the Inflation Reduction Act.
Operations & Maintenance		49 out of 50 states have dam safety program in place. Funding shortfalls stretch state dam safety budgets, affecting staffing needs. States have an average of 1,700 regulated, but only 9 dam inspectors.

Grading Dams

2021 Grade = D+

2025 Grade = D+

Criteria	Change	Why?
Future Need		Significant needs for dams remain, ASDSO reports that \$157.5 billion is required to bring dams into a state of good repair.
Public Safety		In 2022 Congress authorized creation of National Low-Head Dam Inventory, nearly 82% of state regulated HHP dams have an EAP.
Resilience and Innovation		In 2022 Congress passed the PRECIP Act to improve data collection on possible precipitation. ASCE-NOAA Partnership incorporates data into codes and standards. Drones used more frequently for inspection, AI can identify patterns and anomalies in data, dam removal becoming increasingly viable option for dams that no longer provide significant benefit.

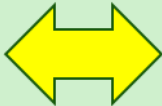
Recommendations to Raise the Grade Dams

- Carefully examine key benefits and trade-offs of dam removal and set practical goals for environmental recovery after removal
- Encourage improved land use planning at the local level
- Modernize methods of estimating probable maximum precipitation
- Complete implementation of a National Low-Head Dam Inventory by 2030
- Continue to build on progress by ensuring that all high hazard-potential dams have an emergency action plan by 2030
- Fully fund the National Dam Safety Program and High Hazard Potential Dam Rehabilitation Grant Program

Grading Levees

2021 Grade = D

2025 Grade = D+

Criteria	Change	Why?
Capacity		24,000 miles of levees have been logged in National Levee Database; this is slightly down after reclassifying some structures previously mis-identified.
Condition		Many levees not built to modern standards/codes. 97% of levees in USACE portfolio have completed a risk assessment, 31% of all levees have risk assessment. 84% of total levees rated as low/very low risk, 13% moderate risk, 3% high or very high risk.
Funding		The National Levee Safety Program (NLSP) has not been appropriated since 2020.
Operations & Maintenance		First ever National Levee Safety Guidelines proposed in 2024. NLSP intended to address issues such as unknown ownership and establishment of state levee safety programs. One third of levees have unknown ownership.

Grading Levees

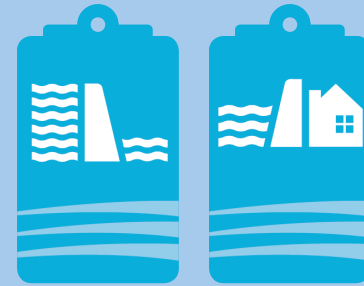
2021 Grade = D

2025 Grade = D+

Criteria	Change	Why?
Future Need		Lack of consistent investment in levee safety means levee repair costs have likely grown since 2021. Limited funding streams means future infrastructure needs likely to grow.
Public Safety		23 million people live behind levees, in addition to \$2 trillion of property value. Underserved communities are over-represented behind levees 41% more than non-leveed communities.
Resilience and Innovation		2022 WRDA added flood risk reduction and climate resilience to definition of "levee rehabilitation project". IJJA provided support for new NOAA precipitation frequency standard. New emerging tech to maintain structural integrity and improve levee performance being tested. Continuous monitoring is underway. Nature Based Solutions being utilized more by USACE.

Recommendations to Raise the Grade Levees

- Complete the development of NOAA's ATLAS 15 precipitation frequency standard, and fund/implement the modernization of maximum probable precipitation estimates prescribed by the PRECIP Act to produce more accurate data
- Increase resources, education, and outreach efforts to those communities that live and work behind levees
- Encourage efforts at all levels of government to achieve risk assessments
- Fully fund NLSP to help states set up state levee safety programs
- Reform cost-benefit analysis thresholds to ensure that underserved communities supported by levees are not at greater risk of flooding



ASDSO Roadmap to Reducing Dam Safety Risks

John Roche, P.E.

Association of State Dam Safety Officials



WHAT IS ASDSO?

The Association of State Dam Safety Officials was established in 1983.

ASDSO traces its roots back to the 1977 Kelly Barnes Dam failure in Georgia (39 fatalities) and subsequent federal inspections that exposed widespread deficiencies in non-federal dam safety programs and laws across the United States.

State regulators recognize the need for collaboration, information sharing, and advocacy to elevate the practice of dam safety risk management.

Today our mission is to improve the condition and safety of dams and lower the risk of dam failures through education, support for state dam safety programs and fostering a unified dam safety community.

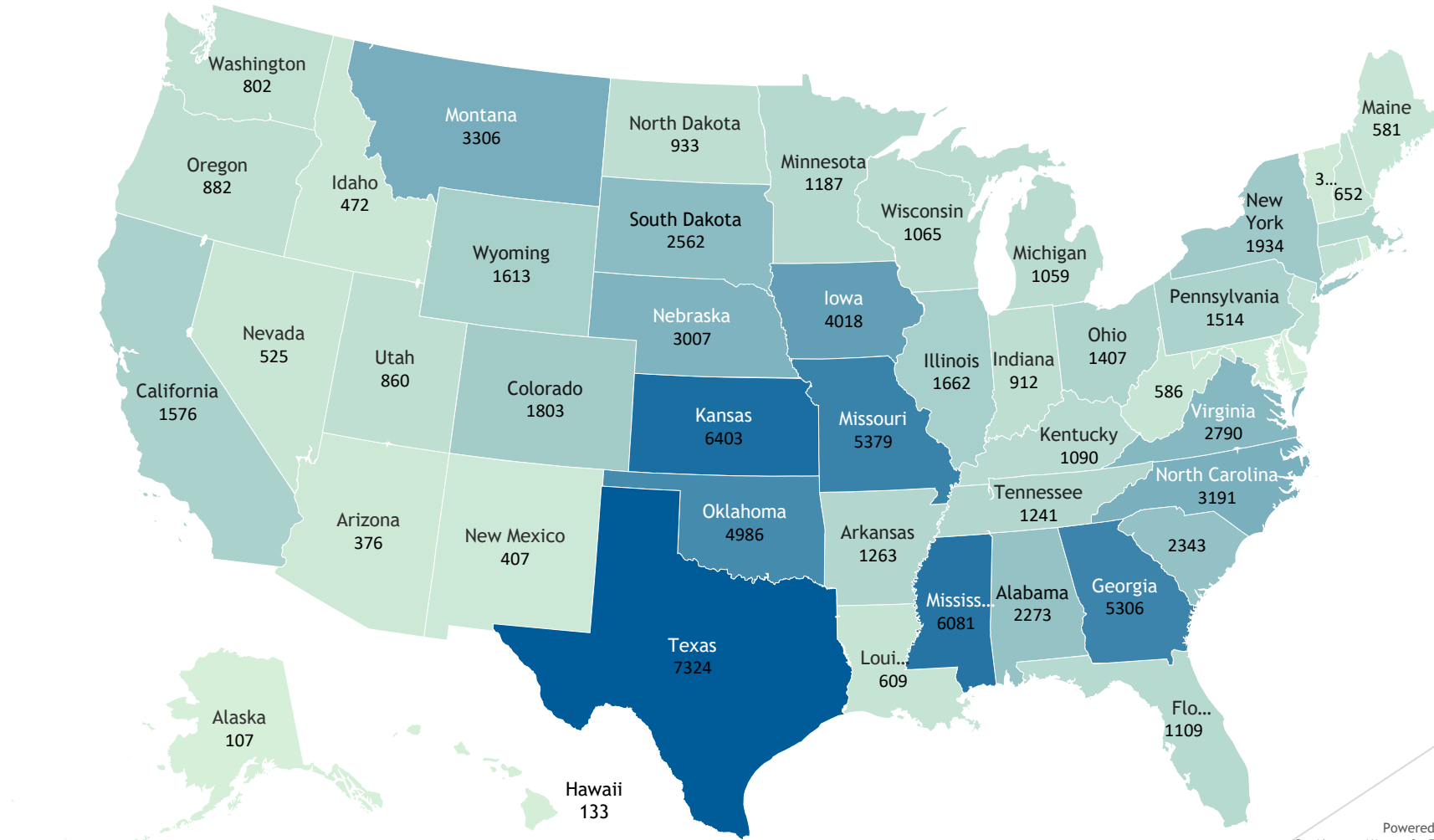
Over 3,500 members including state and federal dam safety officials, private engineering consultants, dam owners and other dam safety stakeholders.



UNDERSTANDING THE SCOPE OF THE PROBLEM

- ▶ There are about **92,000** dams in the United States, as reported to the National Inventory of Dams.
 - ▶ **71%** of dams are regulated for safety by state governments.
 - ▶ **6%** are regulated or owned and self-regulated by federal agencies.
 - ▶ **65%** of dams are privately owned.
- ▶ The actual number of dams is greater - potentially up to 550,000 when factoring an expanded criteria for classification.
- ▶ The number of **high-hazard** potential dams is **growing** nationally. As more development occurs downstream of dams and more people move into potential flood inundation zones, the hazard rating goes up. Upgrades for safety are imperative to reduce the risks.
- ▶ Dams are aging and in need of **rehabilitation** to meet current safety criteria.

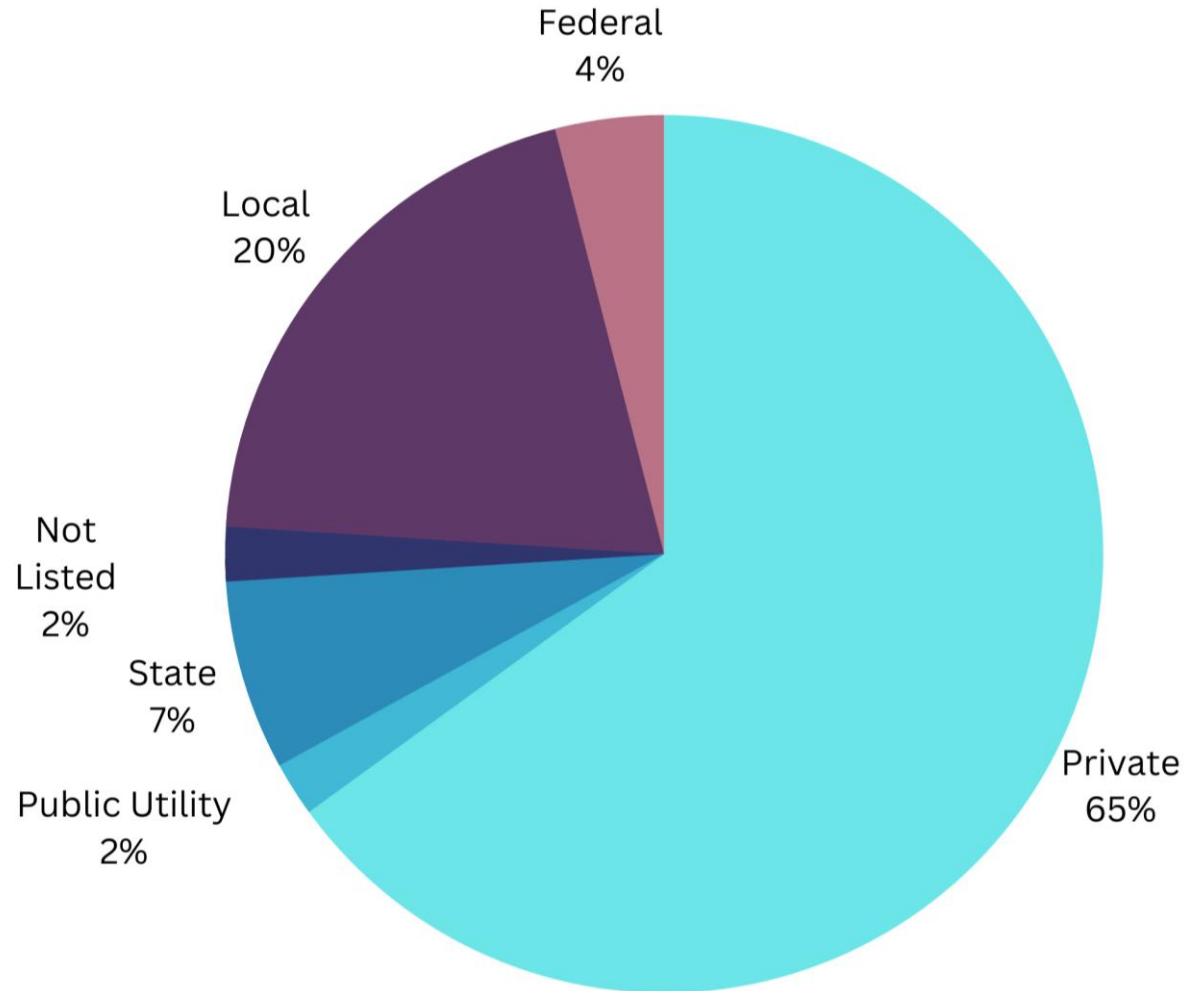
UNDERSTANDING THE SCOPE OF THE PROBLEM



Powered by Bing
© GeoNames, Microsoft, TomTom



UNDERSTANDING THE SCOPE OF THE PROBLEM



Local Examples:

- Districts
- Cities, Counties
- Water Agencies

Private Examples:

- Companies
- Individual Citizens
- Associations (e.g., HOAs)
- Trusts

The Cost of Rehabilitating Dams in the U.S.

A Methodology and Estimate
March 2025

CRITICALLY UNDERFUNDED INFRASTRUCTURE

Unlike roads, bridges, electrical grids – citizens do not realize their direct connection with dams in their everyday life.

ASDSO Estimates the cost of rehabilitating dams in the U.S. at:

Non-Federal: 89,215 dams \$209.6 Billion

**Non-Federal
High Hazard:** 15,703 dams \$48 Billion

THE COLLABORATIVE JOURNEY TO DAM SAFETY.



A ROADMAP TO REDUCING DAM SAFETY RISKS

Despite their importance, our nation's dams are aging and deteriorating while facing increased stress from a changing climate and increasing downstream populations that are potentially at risk. This situation demands greater attention and investment in measures that reduce risks to public safety and economic assets.

ASDSO proposes the following strategy to reduce risks to public safety and to “raise the grade.”

This requires steadfast commitment from each group mentioned here. No single entity can solve this problem alone.

damsafety.org/roadmap



ASDSO

- ✓ Support the improvement of state dam safety programs.
- ✓ Advance and expand the technical expertise of dam and levee safety practitioners through training and education programs.
- ✓ Reduce the consequences of dam failure by increasing public awareness, planning, and preparedness.
- ✓ Advocate for laws, policies, and government programs that serve to improve the safety of dams and reduce the risk to the public.



U.S. CONGRESS AND FEDERAL AGENCIES

- ✓ Recognize that public safety is a national responsibility.
- ✓ Support and fully fund the National Dam Safety Program and the CISA Dams Sector Specific Agency to increase national coordination and support for dam safety and security.
- ✓ Support and provide increased appropriations for all federal dam rehabilitation loan and grant programs, including the High-Hazard Potential Dam Rehabilitation Program, the U.S. Army Corps of Engineers' Water Infrastructure Financing Program, and the Watershed Rehabilitation Program.
- ✓ Provide adequate resources to all Federal agencies that own, regulate, or provide technical or research support for dams.



THE NATIONAL DAM SAFETY PROGRAM

- ✓ Facilitate and support the strengthening of State dam safety programs.
- ✓ Reconstitute the National Dam Safety Review Board.
- ✓ Effectively implement the National Rehabilitation of High Hazard Potential Dams grant program to cost-share safety upgrades to non-federal, high-hazard potential dams across all states.
- ✓ Implement a national public awareness campaign to educate individuals on the location and condition of dams in their area and become more “dam aware.”
- ✓ Increase and improve training programs for dam safety engineers (including regulators, engineering consultants, owners, and operators).
- ✓ Promote a coordinated strategy within the dam safety community to study, archive, and disseminate lessons to be learned from failures and incidents.
- ✓ Encourage better coordination between agencies (federal and state).



GOVERNMENT AT ALL LEVELS (STATE, LOCAL, TRIBAL, FEDERAL)

- ✓ Maintain and constantly review and improve dam safety regulatory laws, policies, and programs.
- ✓ Provide sufficient resources, staffing, and regulatory authorities to dam safety programs.
- ✓ Ensure that adequate data on dams is available to policymakers to facilitate decision-making on funding, and to the general public to promote public awareness.
- ✓ Implement innovative grant or loan programs and/or require dam owners to save for inevitable rehabilitation costs via a state-run infrastructure bank to shore up deficient dams.
- ✓ Update hydrometeorological models and tools to account for what is known about climate change and current data.



DAM OWNERS

- ✓ Ensure dams meet current state, federal, and industry safety standards.
- ✓ Maintain and operate dams to ensure that they do not fail.
- ✓ Hire experienced professional engineers to oversee dam safety engineering issues.
- ✓ Develop emergency action plans (EAP) for every high-hazard potential dam. Integrate exercising into the planning process. Share plans and maps with local planners and first responders.
- ✓ Improve signage, fencing, and other barriers to educate and protect the public from drowning hazards around dams.
- ✓ Attend educational programs when offered by organizations and agencies.



EMERGENCY MANAGERS

- ✓ Keep open lines of communication with State and Federal dam safety agencies to improve planning and preparedness for dam failures or incidents.
- ✓ Participate in educational programs to become more aware of dams and how they intersect with emergency and floodplain management.
- ✓ Work collaboratively with dam safety managers to prepare for, respond to, and recover from floods and dam safety incidents.



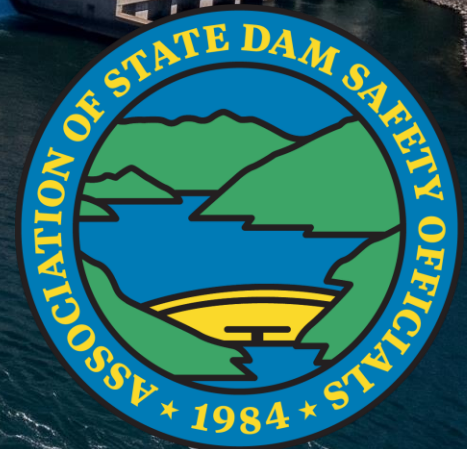
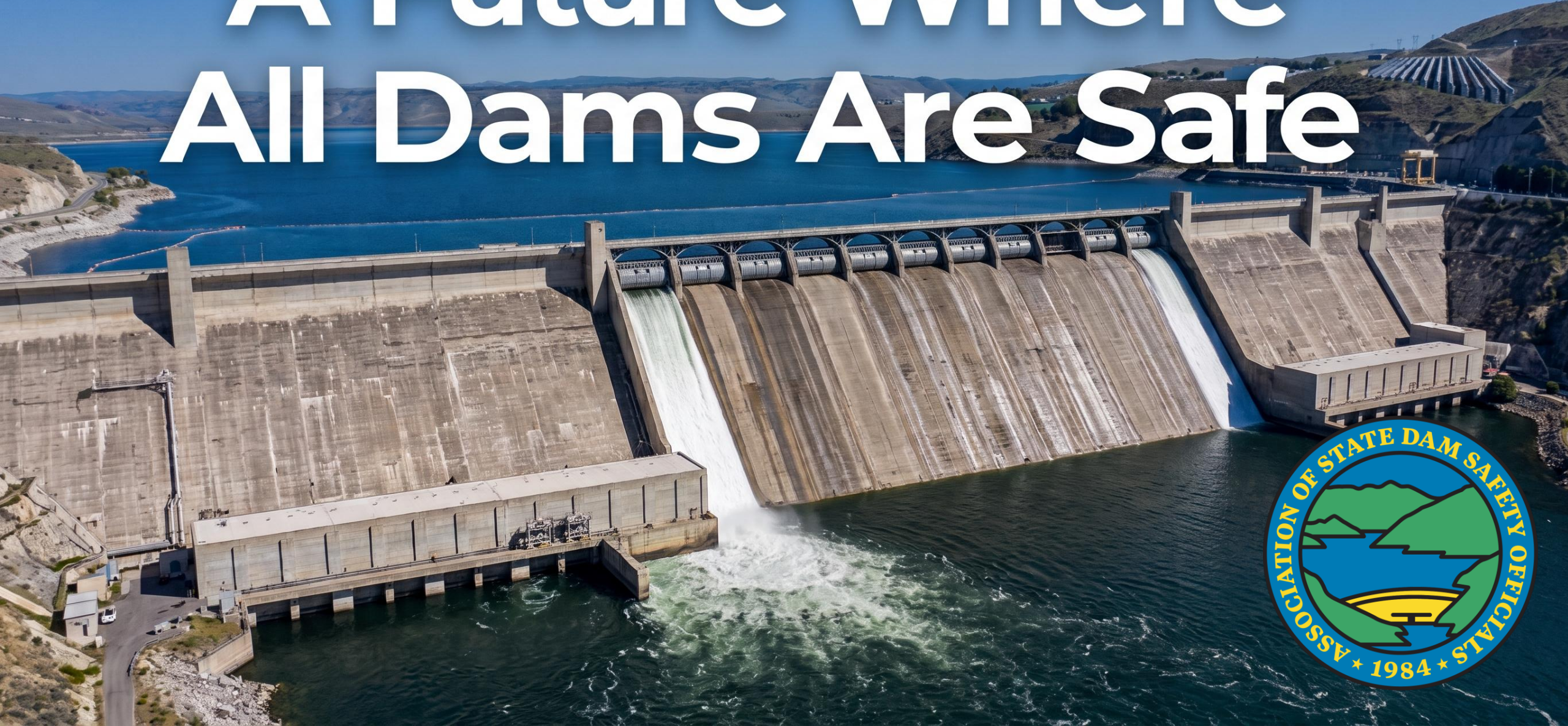
CITIZENS

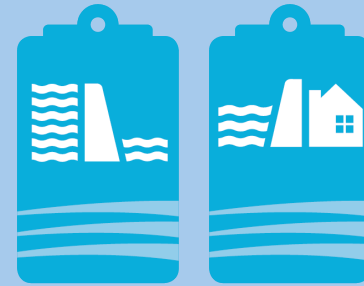
- ✓ Be aware of their surroundings, risks they may face, and steps they can take now to protect themselves and their families from floods should a dam fail or release flood waters.
- ✓ Have a plan in place if an evacuation becomes necessary. Listen to first responders and emergency managers and follow directions given in the event of a dam incident or failure.

It is unfortunate that many people who live in dam failure inundation zones are completely unaware of the potential hazard lurking upstream.



A Future Where All Dams Are Safe



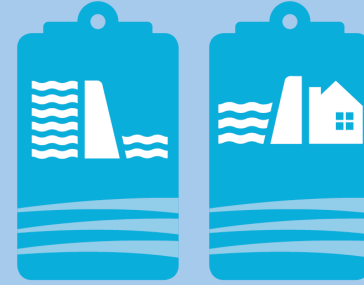


Improving Levee Safety

Mike Bachand, P.E.
GEI Consultants, Inc.



Agenda – Improving Levee Safety



Learn From The Past



Current Status

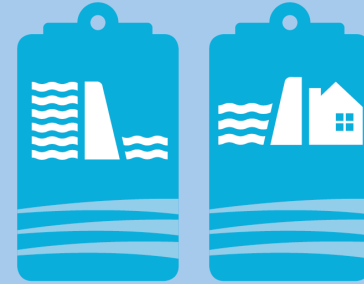


**ASCE Report Card – Levee
Recommendations**



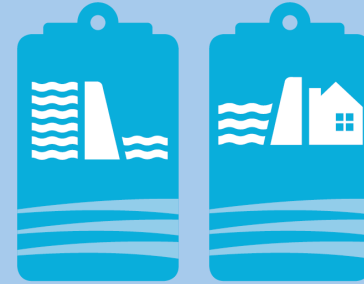
Example Projects

Learning From The Past



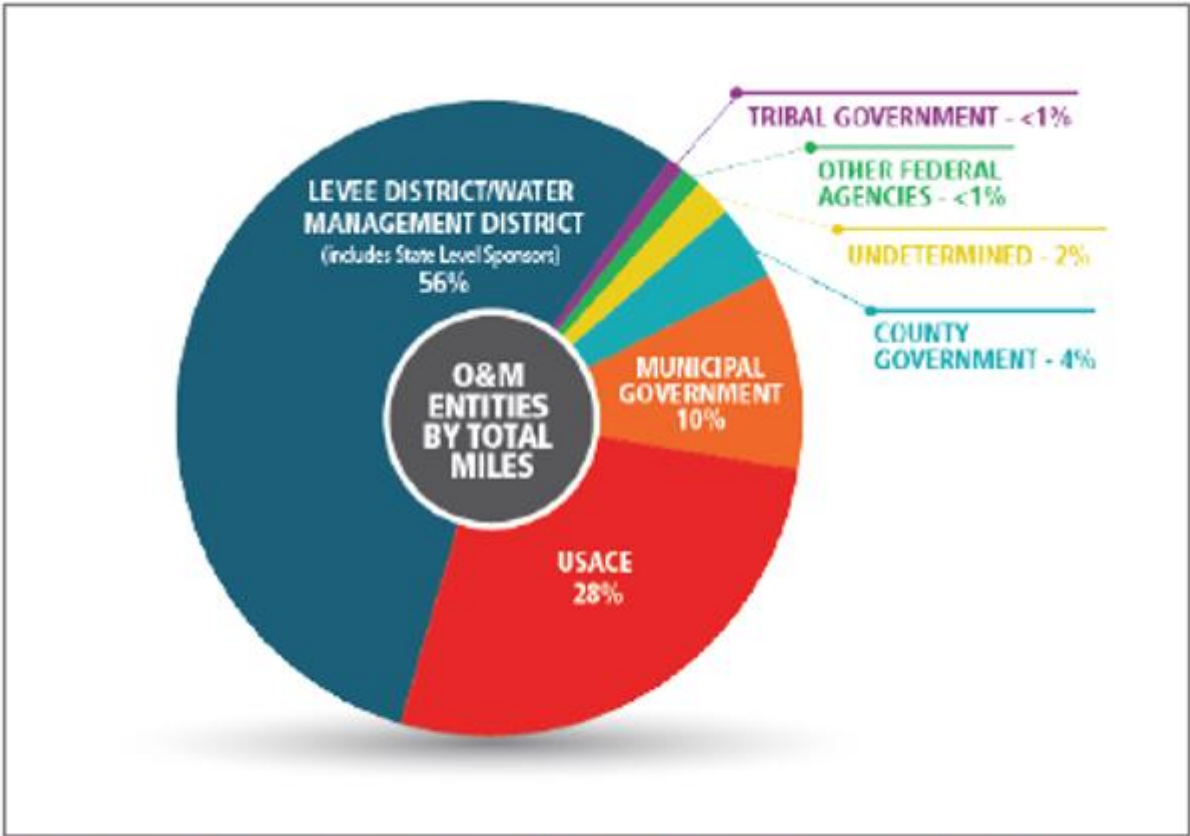
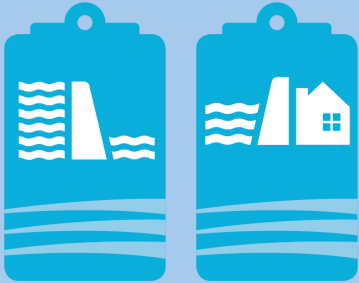
	Dams	Levees
Event(s)	▪ Kelly Barnes Dam Failure (1977) ▪ Teton Dam Failure (1976) ▪ Buffalo Creek Dam Failure (1972)	▪ Hurricane Katrina (2005)
Response	Two independent review teams formed – Department of the Interior Teton Dam Failure Review Group – Independent Panel to Review Cause of Teton Dam Failure	Two independent review teams formed – Interagency Performance Evaluation Task Force – American Society of Civil Engineers External Review Panel
Legislation Created	National Dam Inspection Act (1972) – Inventory and inspect dams – Make recommendation for a national program	National Levee Safety Act (2007) – Create a database – Inventory and inspect levees – Make recommendation for a national program
Implementation	▪ <i>National Dam Safety Program legislation was initially enacted in 1986.</i> ▪ <i>The program itself first implemented in 1996 (10 years later).</i>	▪ <i>Legislation to form the National Levee Safety Program was initially enacted in 2014.</i> ▪ <i>Intent is to implement the program in 2023 (~ 10 years later).</i>

Learning From The Past

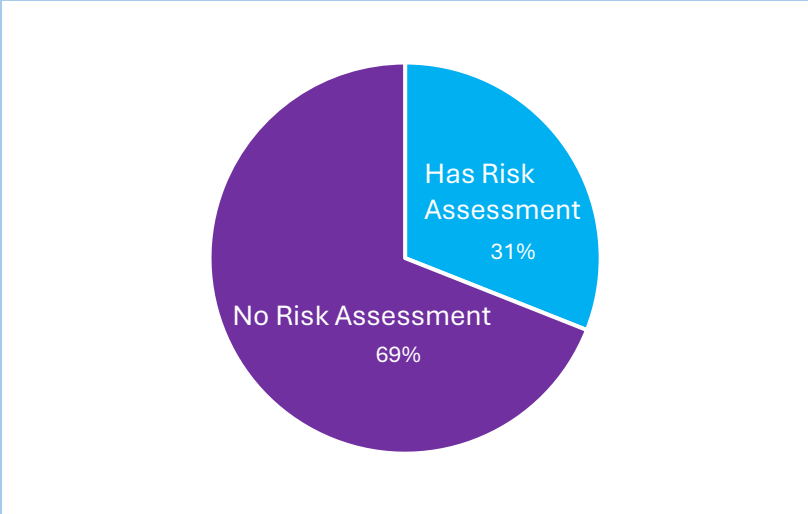


Dams	Levees
• Over 90,000 dams • Average age – nearly 60 years old • Over 80% of all large dams are earthen embankments • 16,006 miles of dams (for the 79K that are reported in the NID) • 72% of dams listed in NID are regulated by states; ~5% are federally regulated (0.8% are regulated by USACE)	• Over 6,800 levee systems • Average age – nearly 60 years old • 97% are earthen embankments • Over 24,000 miles of levees • Only 23% of levees in the NLD fall under USACE Levee Safety Program.
• <i>All 50 states are involvement in dams. 49.5 recognized under the National Dam Safety Program</i>	• <i>Approximately 20 states have some involvement in levees</i>

Current Status



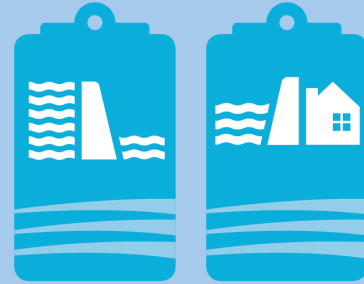
BREAKDOWN OF USACE PORTFOLIO OF LEVEES BY ENTITY RESPONSIBLE FOR OPERATION AND MAINTENANCE AND THE PERCENTAGE OF MILES OF THE TOTAL PORTFOLIO (SOURCE: NATIONAL LEVEE DATABASE).





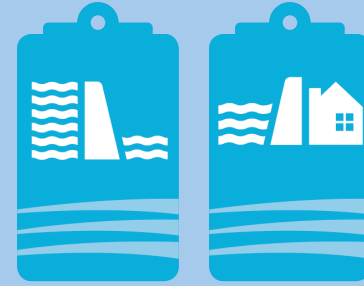
RECOMMENDATIONS TO RAISE THE GRADE

- Fully fund the National Levee Safety Program to help states set up state levee safety programs, finalize and promulgate National Levee Safety Guidelines, and strengthen the National Levee Database.
- Reform cost-benefit analysis thresholds to ensure that underserved communities supported by levees are not at greater risk of flooding from levee breaches or prioritized for levee development if needed.
- Encourage efforts at all levels of government to achieve risk assessments for levees.
- Increase resources, education, and outreach efforts to those communities that live and work behind levees to communicate to the public the risks and consequences of levee failure.
- Complete the development of NOAA's ATLAS 15 precipitation frequency standard, and fund and implement the modernization of maximum probable precipitation estimates prescribed by the PRECIP Act to produce more accurate data on current and future rainfall events.



Central City Project

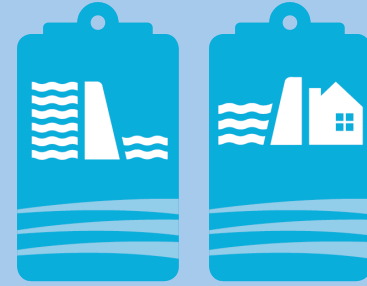
Upper Trinity River, Fort Worth, TX



- Fort Worth is one of country's fastest growing cities
- Population has nearly tripled from 350,000 to over 1 million since 1960s when USACE built existing levee system
- Increased development results in higher flood risk
- Additional measures are needed to maintain and expand the flood protection system



Fort Worth Central City Project Components

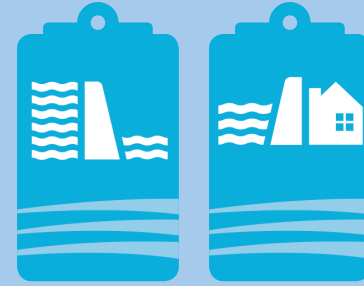


- Reroute a section of the Trinity River through a new 1.5 mile bypass channel
- Construct flow regulating structures: Samuels Ave Dam, isolation gates and pump station
- Create flood water storage sites to collect water and mitigate downstream flooding





Balancing Flood Risk Management with Enhanced Community Access

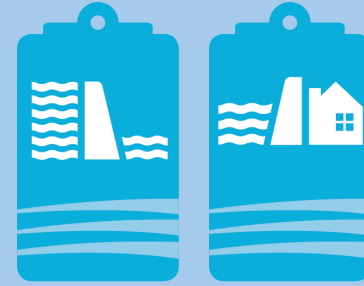


- Bypass channel will include a levee on the west side of the channel and floodwall on the east side
- Upper- and lower-promenade areas to support public use and access on floodwall side
- Pathways provided on the levee side of the channel
- Pedestrian bridge to connect both sides of the channel



Hartford Levee System Improvements

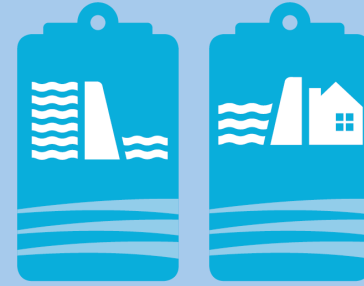
Connecticut River, Hartford, CT



- Hartford is known as the “Insurance Capitol of the World”
- 7+ miles of Levee & Floodwalls
- Constricted in the 1940’s
- Over 30,000 PAR and \$2B in potential economic damages
- Increased development results in higher flood risk
- Inspections & risks assessments highlighted the need for modifications/improvements

Hartford Levee System Improvements

Connecticut River, Hartford, CT



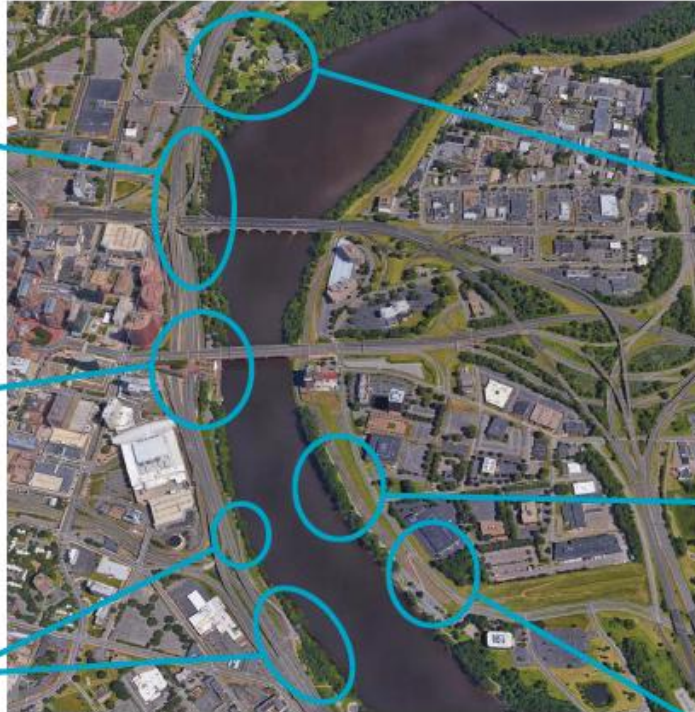
Buckley Bridge Walkabout



I-91 State Street Landing



Riverwalk South Colt Gateway



Riverside Park - Boat Dock, Crew Dock, Embayment, Shoreline Stabilization



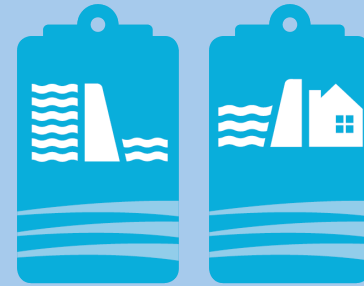
New Pier Project



East Hartford Great River Park Boat Ramp



- Floodwall Improvements
- Toe Drain Replacement
- Closure Structure Upgrades
- Public education, outreach, and engagement



Improving Dam Safety

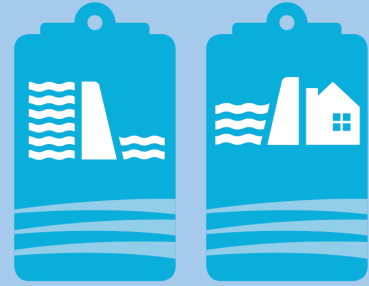
Bill Foos

U.S. Society on Dams





United States Society on Dams



Our History

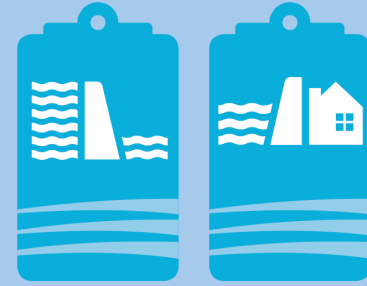
- Founded in 1988, evolving from the U.S. Committee on Large Dams (USCOLD), with roots in international dam engineering congresses dating back to the 1930s.
- The official United States representative to the International Commission on Large Dams (ICOLD).
- Unites more than 1,300 engineering professionals and firms across the dam and levee community.

Our Mission

- Mission: Advancing the practice of Dams through collaboration and advocacy to create safe, equitable and sustainable solutions.
- Vision: A world where Dams are managed responsibly, safely and securely protecting the communities they serve.



Position USSD as:

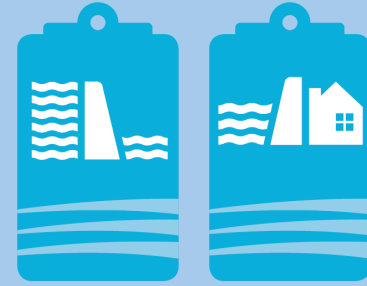


- A **connector across disciplines** (dams, levees, regulators, consultants)
- A **bridge between technical practice and policy/strategy**
- A leader in **risk-informed decision-making for water infrastructure**

“Advancing Technical Excellence”



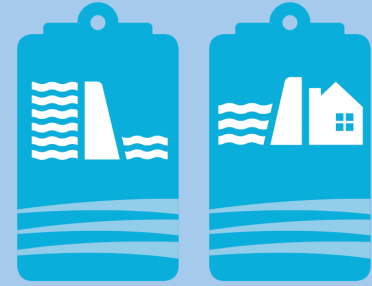
Integrated Risk Management



- Importance of **risk-informed decision-making (RIDM)** across dams *and* levees
- Moving beyond compliance → toward **prioritized risk reduction**
- Need for consistency in:
 - Risk methodologies
 - Communication of risk to stakeholders
- Real challenge: **translating technical risk into actionable decisions**

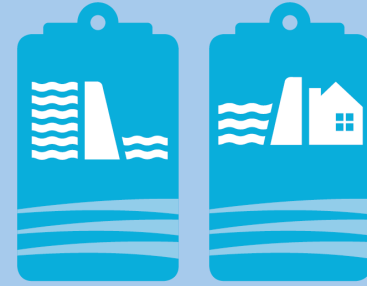


Dams + Levees as a System (Not Silos)



- Watershed/system-level thinking vs. asset-by-asset
- Interdependencies:
 - Flood control
 - Water supply
 - Downstream consequences
- Increasing need to manage **portfolio-level risk**, not just individual structures

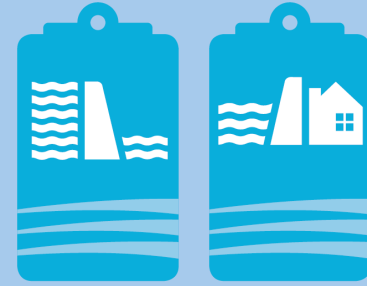
Aging Infrastructure + Investment Gap



- Significant portion of dams/levees are **aging and underfunded**
- Deferred maintenance → elevated risk profile
- Challenge = **prioritization under constrained budgets**

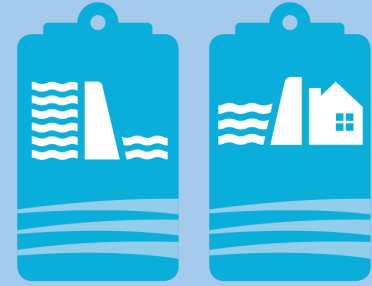


Climate Variability & Changing Risk Profiles



- Hydrology is changing (non-stationarity)
- Design assumptions are outdated
- Increasing:
 - Extreme precipitation events
 - Flood frequency/intensity
- Need to rethink:
 - Design criteria
 - Spillway capacity
 - Emergency preparedness

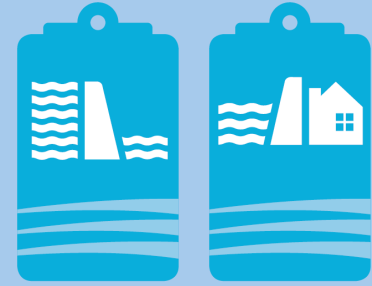
Emergency Preparedness & Public Safety



- Importance of:
 - Emergency Action Plans (EAPs)
 - Warning systems
 - Coordination with local agencies
- Gap between:
 - Having a plan
 - Being ready to execute it

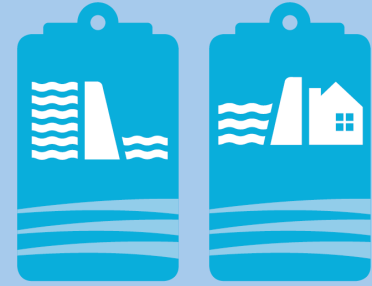


Workforce & Knowledge Transfer



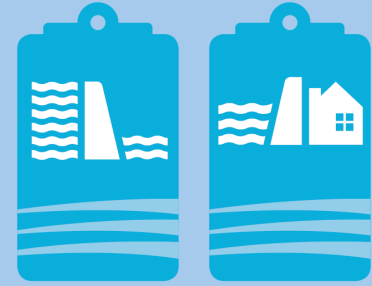
- Aging workforce / loss of institutional knowledge
- Need to:
 - Engage younger professionals
 - Create pathways for contribution (not just leadership roles)
- Importance of:
 - Committees
 - Cross-disciplinary collaboration

Collaboration Across Organizations (Bridge Topic)



- No single organization owns the solution
- Need alignment across:
 - USSD
 - ASDSO
 - ASCE
 - USACE
 - FEMA
 - State regulators

Innovation & Technology

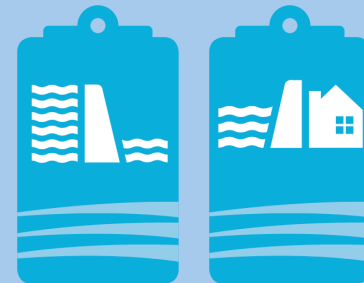


- Monitoring technologies (instrumentation, remote sensing)
- Data analytics for risk prioritization
- Digital tools to support decision-making

Summary



- USSD: Advancing Technical Excellence
- Integrated Risk Management
- Dams and Levees as a System
- Aging Infrastructure and Investment Gap
- Climate Variability and Changing Risk Profiles
- Emergency Preparedness and Public Safety
- Workforce and Knowledge Transfer
- Collaboration Across Organizations
- Innovation and Technology

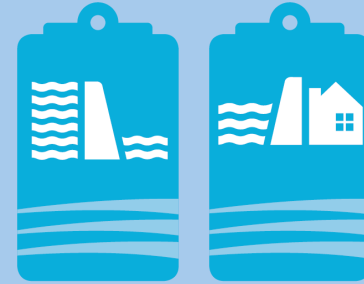


Case Studies

Dan Wade, P.E., G.E., F.ASCE
GEI Consultants, Inc.



Case Studies

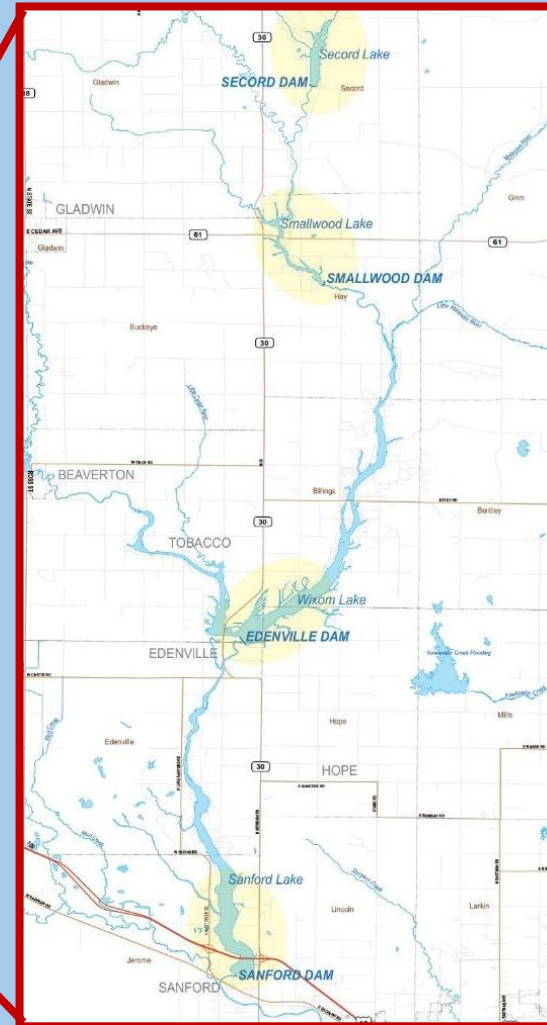
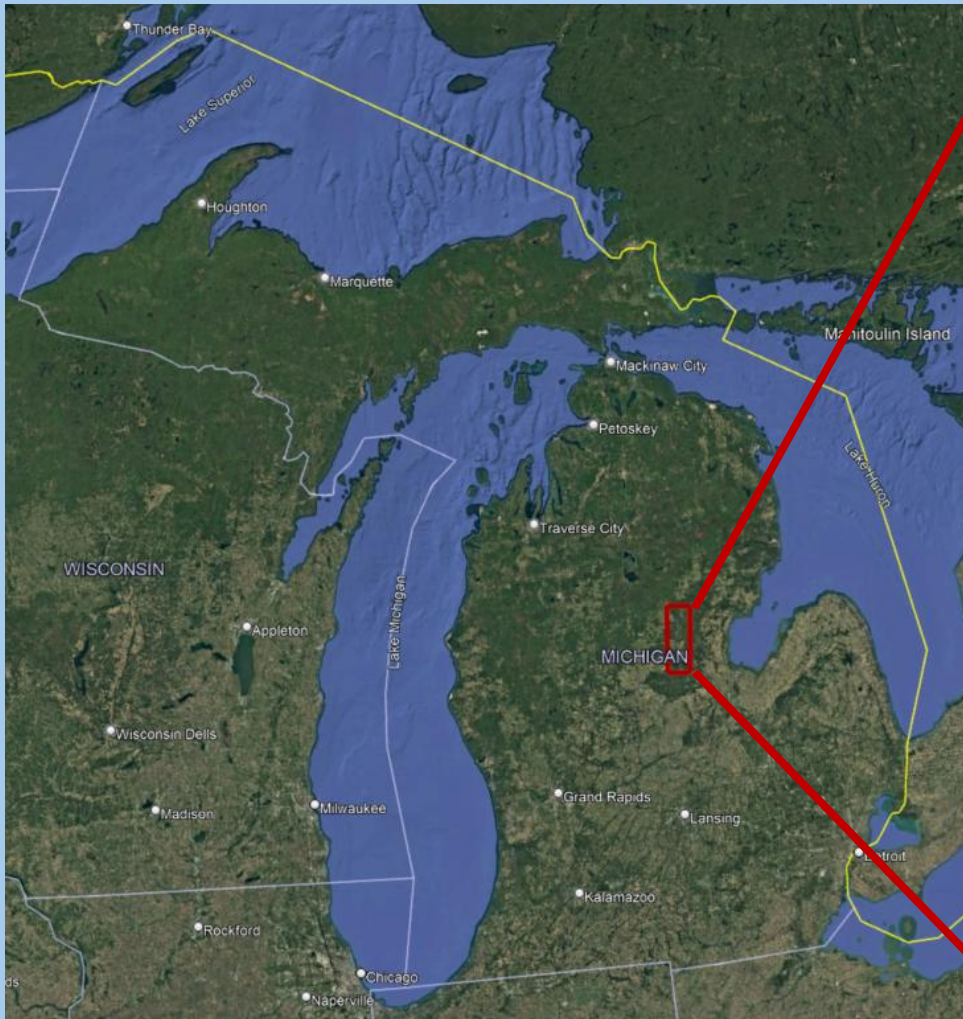
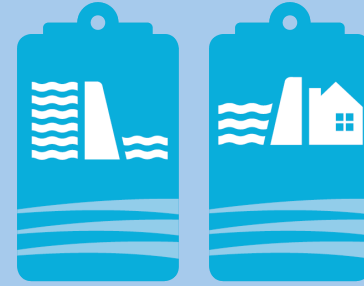


Four Lakes Task Force Dams
Michigan



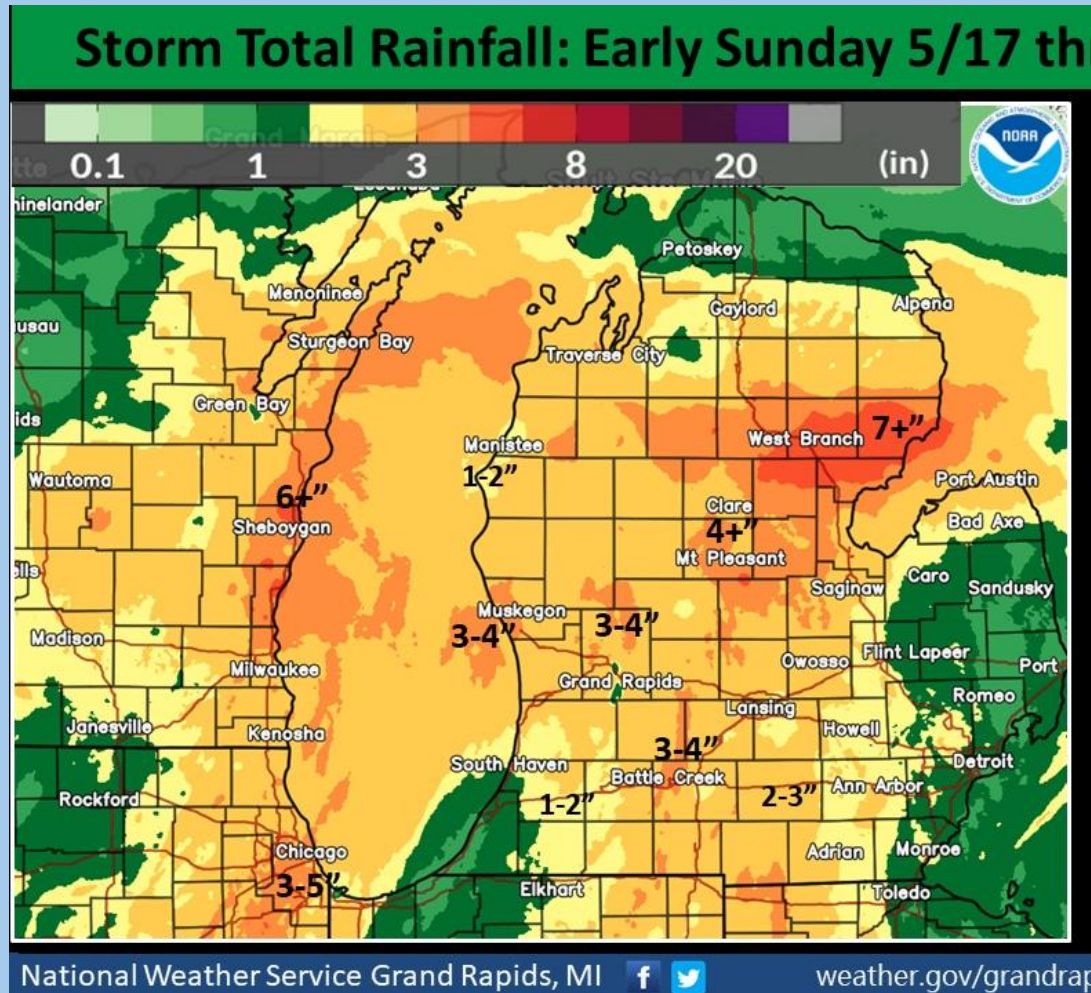
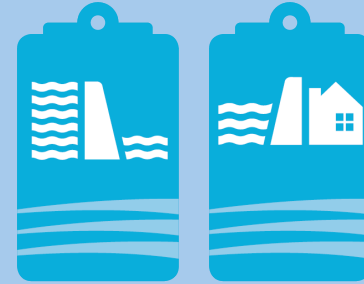
Anderson Dam, Santa Clara Valley
Water District, California

Four Lakes Task Force Dams, MI



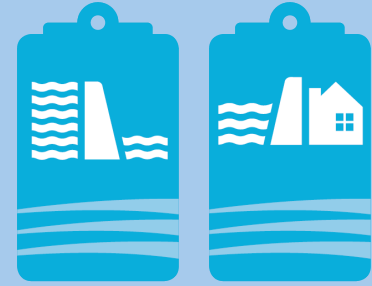
- Four Lakes Task Force Special Assessment District includes 8,400 parcels valued at \$800M
- 4,000 acres, 40-mile system of lakes
- Significant economic engine for the region
- Separate owner of four hydropower dams at Secord, Smallwood, Edenville, and Sanford
- Under-invested hydropower system was recognized

May 19, 2020



- Heavy rains cause Edenville Dam to breach; Sanford Dam subsequently fails
- Catastrophic widespread flooding
- Road and bridge failures
- FERC orders water levels of Secord and Smallwood dams lowered for inspection and determined unsafe for operations
- Nearly 40-mile lake ecosystem devastated
- Dams' owner (Boyce Hydro) was unresponsive

Edenville Dam Failure

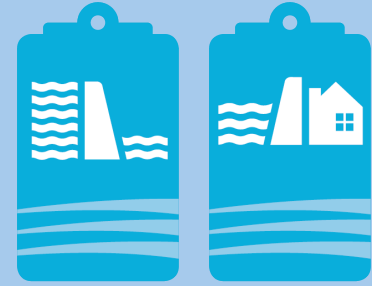


Edenville Dam – Post Failure



Planet Labs image of the aftermath of the Edenville Dam failure. Planet Labs, used with permission.

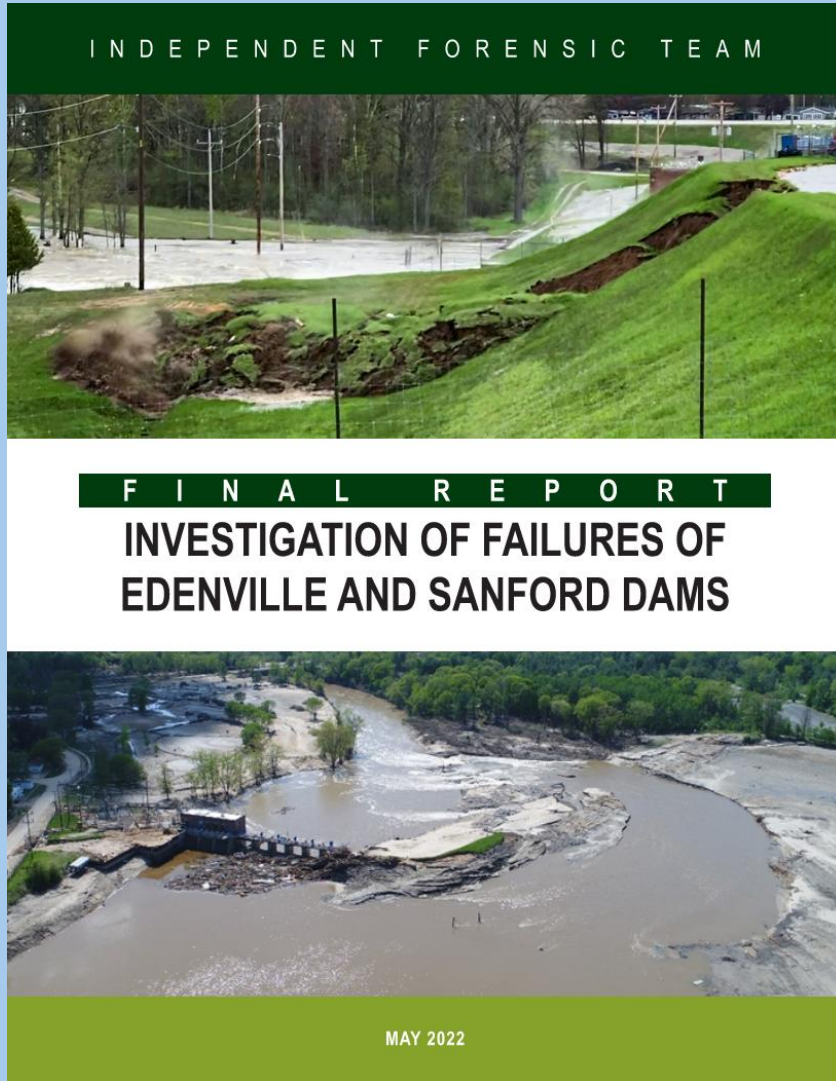
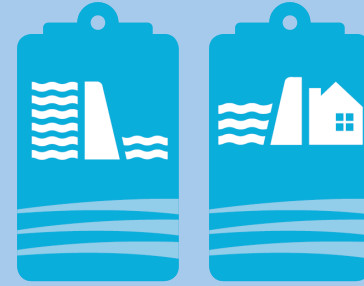
Overtopping of Sanford Dam



OVERTOPPING OF SANFORD DAM



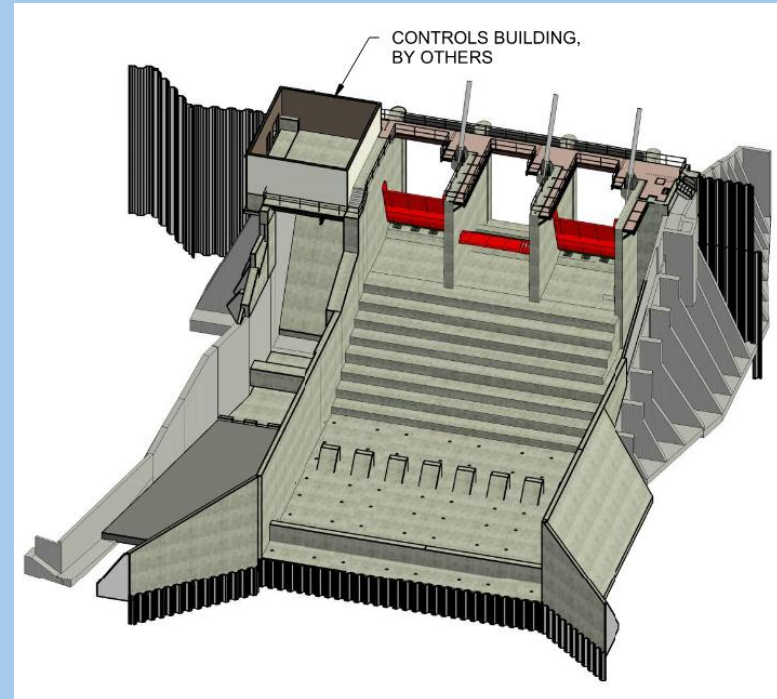
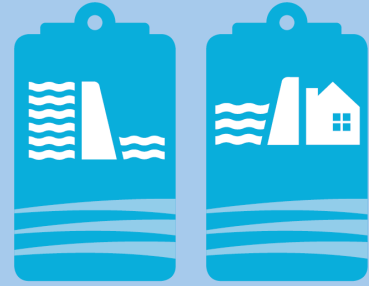
Moving Forward



- Independent Forensic Team (IFT) was commissioned to perform a failure root cause evaluation
- GEI tasked with reconstruction designs of the Four Lakes Task Force (FLTF) Dams:
 - Repairs at Secord and Smallwood Dams
 - Reconstruction of Edenville and Sanford Dams



Rehabilitation Work

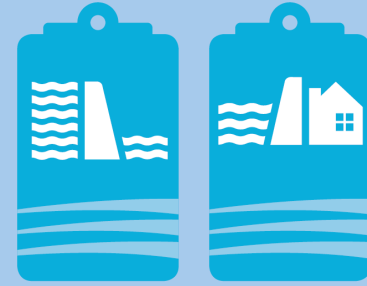


- Phased reconstruction approach
- Embankment rehabilitation / enhancements
- New primary spillways and gates
- New auxiliary spillways
- Construction cost: \$~350M

Anderson Dam, California

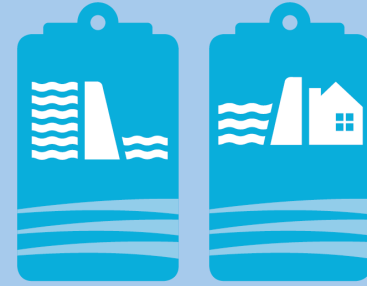


Anderson Dam Background



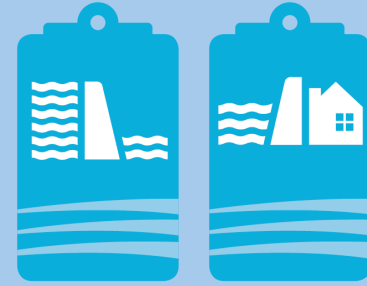
- Owned and operated by Santa Clara Valley Water District (Valley Water)
- Largest water supply reservoir in Valley Water's system
- Original construction 1950
- Region of high seismicity
- Preliminary seismic evaluation studies published in 2011 resulted in voluntary reservoir restriction

Anderson Dam Deficiencies



- Outlet Works: would not accommodate the maximum credible earthquake fault displacement or meet emergency evacuation requirements
- Embankment Dam: alluvium left in place in portions of dam foundation and lower fine fill in downstream shell are susceptible to liquefaction
- Spillway: would not safely pass the probable maximum flood

Anderson Dam Seismic Retrofit Project



Address dam safety:

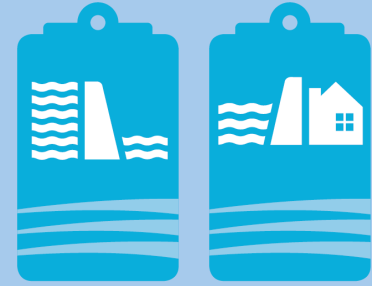
- Replace existing outlet with low-level and high-level outlets
- Replace most of existing dam with zoned embankment dam
- Replace and extend spillway

Operate reservoir without restriction:

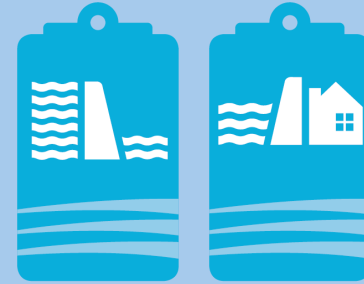
- Municipal and domestic water supply
- Environmental benefits
- Groundwater recharge
- Recreation

FERC order includes additional compliance projects, including Anderson Dam Tunnel and environmental mitigation projects

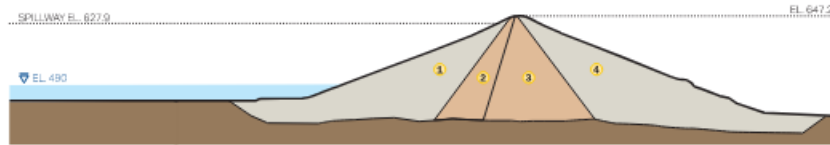
Anderson Dam Tunnel Project



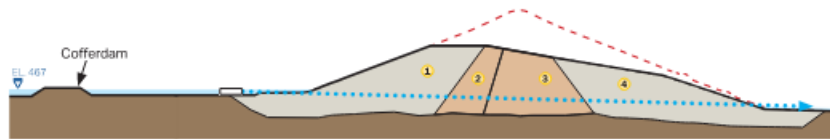
Embankment Dam Construction



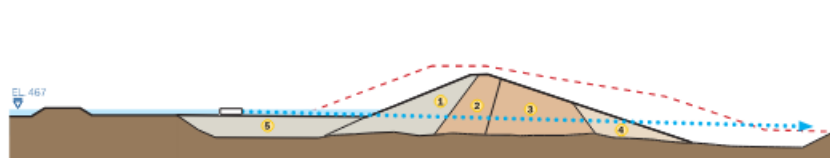
Construction Season - Year 1 - Existing Dam



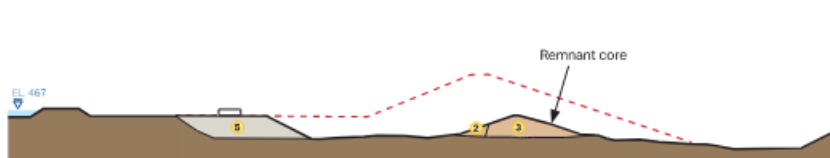
Construction Season - Year 2 - Stage 1A Interim Dam



Construction Season - Year 3 - Stage 1B Interim Dam

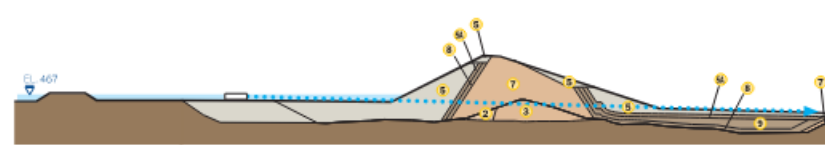


Construction Season - Year 4 - Stage 2A Interim Dam

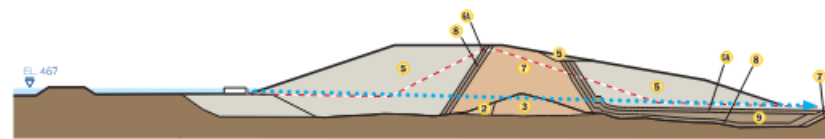


--- Previous stage dam surface Diversion 1 Existing Upstream Shell 4 Existing Downstream Shell
2 Existing Finer Core 5 Shell
3 Existing Coarser Core

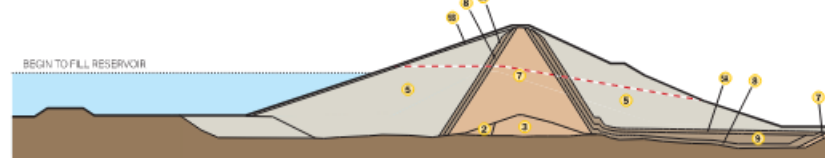
Construction Season - Year 4 - Stage 2B Interim Dam



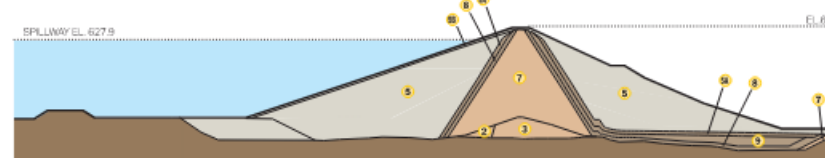
Construction Season - Year 5 - Stage 3A Interim Dam



Construction Season - Year 6 - Stage 3B Interim Dam

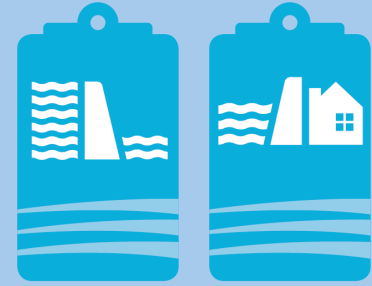


Construction Season - Year 7 and Beyond - Replacement Dam



--- Previous stage dam surface Diversion 2 Existing Finer Core 5 Shell 7 Core
3 Existing Coarser Core 4 Transition 8 Filter
4 Oversize Shell 9 Drain

Project Cost and Funding



Total Project Cost: \$2.8 billion

- Includes ADRSP
- Plus portions of ADTP and the FERC Order Compliance Projects

Funding Sources:

- Majority of funding provided by water utility ratepayers
- Safe, Clean Water and Natural Flood Protection Program: \$54M
- Federal WIFIA Loan: Up to \$580M
- Applied for State & Federal grants



Questions?



**Thank you
to today's
sponsor!**



Find more details, please visit InfrastructureReportCard.org.