



5 Minute Break

How Did We Get Here?

A Brief History of Maryland's Dam Regulations, Laws, and Procedures

What's in Your Pond

16 September 2020

John Roche, P.E.



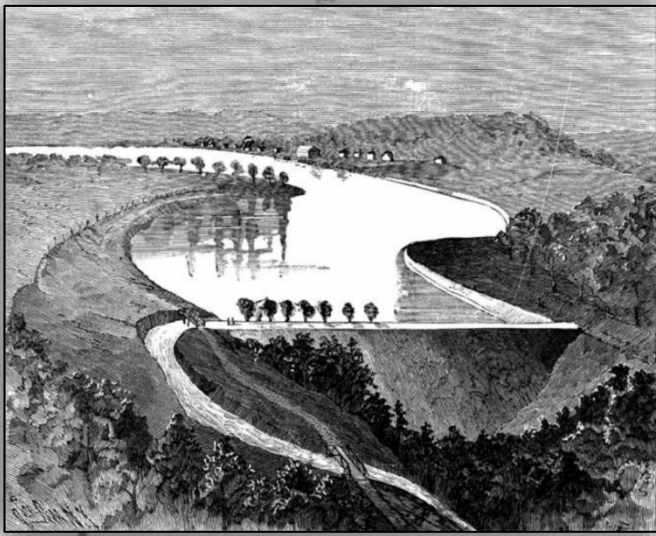
Maryland
Department of
the Environment

South Fork Dam Johnstown, PA 1889

2,209+ Dead

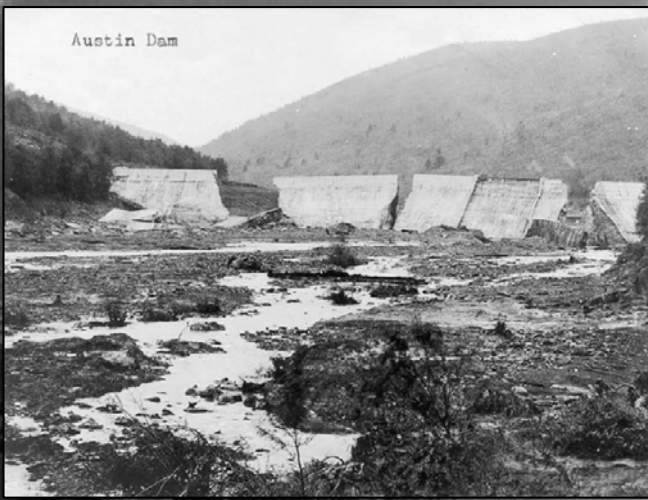
1,700 structures destroyed

\$500 Million in Damages (2020)



Main Image: [Library of Congress](#)

Inset: Johnstown Area Heritage Assoc. (used with permission)



Austin (Bayless) Dam Austin, PA 1911

78 Dead

\$275 Million in Damages (2020)



2295-11

Main Image: [Library of Congress](#)

Inset: [DamFailures.org](#)

St. Francis Dam Santa Clarita, CA 1928

431+ Dead

\$100 Million in Damages (2020)



Main Image: [Stearns, H.T., USGS](#)

Inset: Los Angeles Times Photographic Archive, Library Special Collections, Charles E. Young Research Library, UCLA (used with permission)



What's in your pond?

IN THE BEGINNING

- Dam Engineers must not be afraid to learn from failures
 - Lessons learned from failures drive regulation and improve state of practice
- Water Resources Commission of Maryland
 - First met Tuesday September 22, 1931 11:00am
 - Primary focus: Need to regulate water supply resources (1930-31 drought)
 - Enabling Legislation, Chapter 247 of the Acts of 1931
 - Prepare and submit a report to General Assembly of 1933, include findings, recommendations and a legislative program



- Meeting minutes reflect second topic discussed in first meeting:

Another problem in connection with water supply is the absence of any State control over the location, design and construction of dams and reservoirs. Several large dams have been built in Maryland within the past few years with no State agency having any jurisdiction over the structural features thereof, except such regulation as is exercised by the State Department of Health. The absence of State control may result in the failure of such structures similar to experiences noted in other states where no such regulations existed.

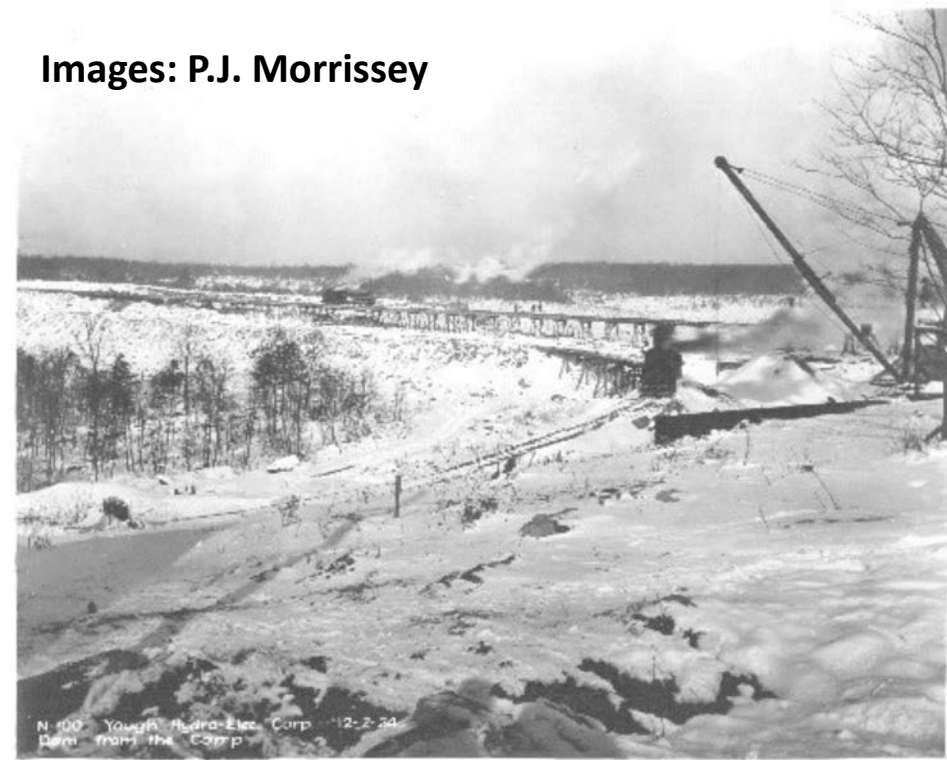
- Regulations enacted or under development in NY, PA, OH, CA, CO, and CT were to be used as models



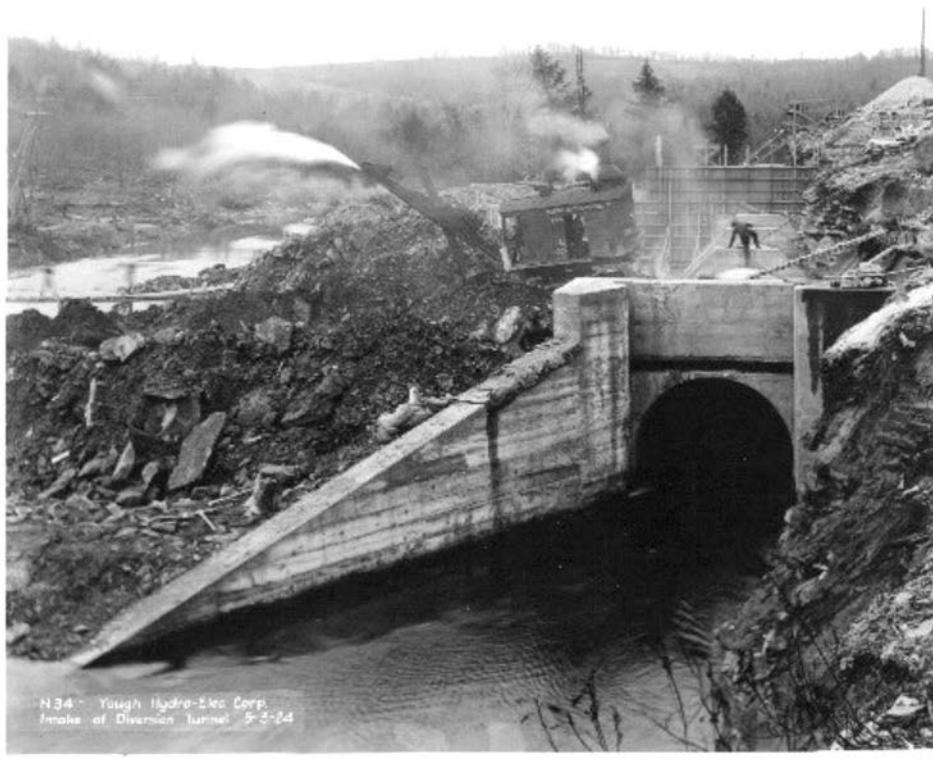
- Maryland Water Resources Commission
 - Created in 1933 under Chapter 526
 - Created permit requirements for “Control the construction and repairs of reservoirs, dams and waterway obstructions”
 - Included provisions for public hearings and ability to order dam owners to remove a dam if found to be unsafe
 - Meeting minutes reflect review and approval of a number of dams that remain in existence today



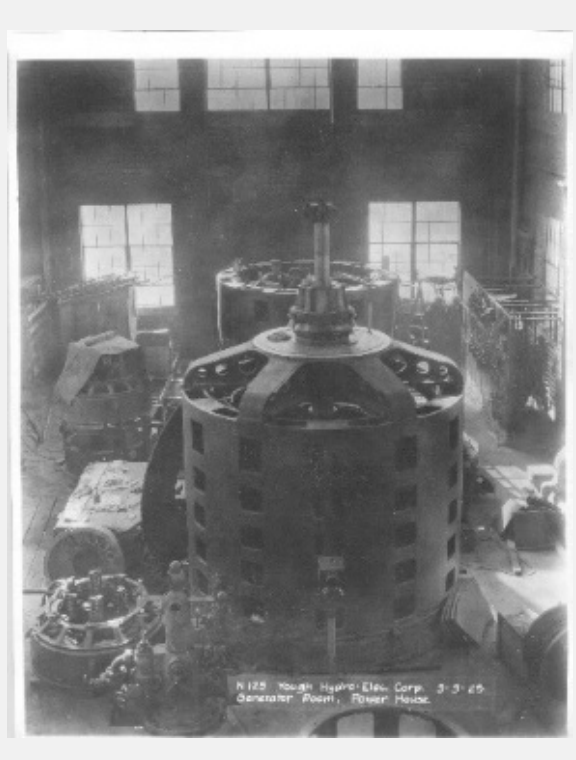
Images: P.J. Morrissey



N 100 Yough Hydro-Elec. Corp. 12-2-24
Dam from the Corp.



N 34 Yough Hydro-Elec. Corp.
Inlets of Diversion Tunnel 9-2-24



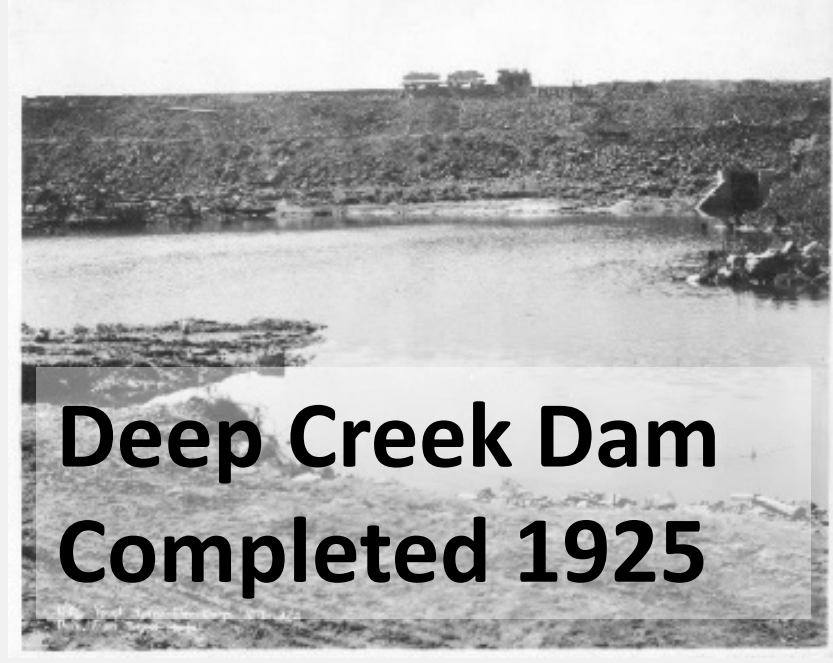
N 125 Yough Hydro-Elec. Corp. 3-3-25
Generator Room, River House



N 82 Yough Hydro-Elec. Corp. 11-1-24
Dam

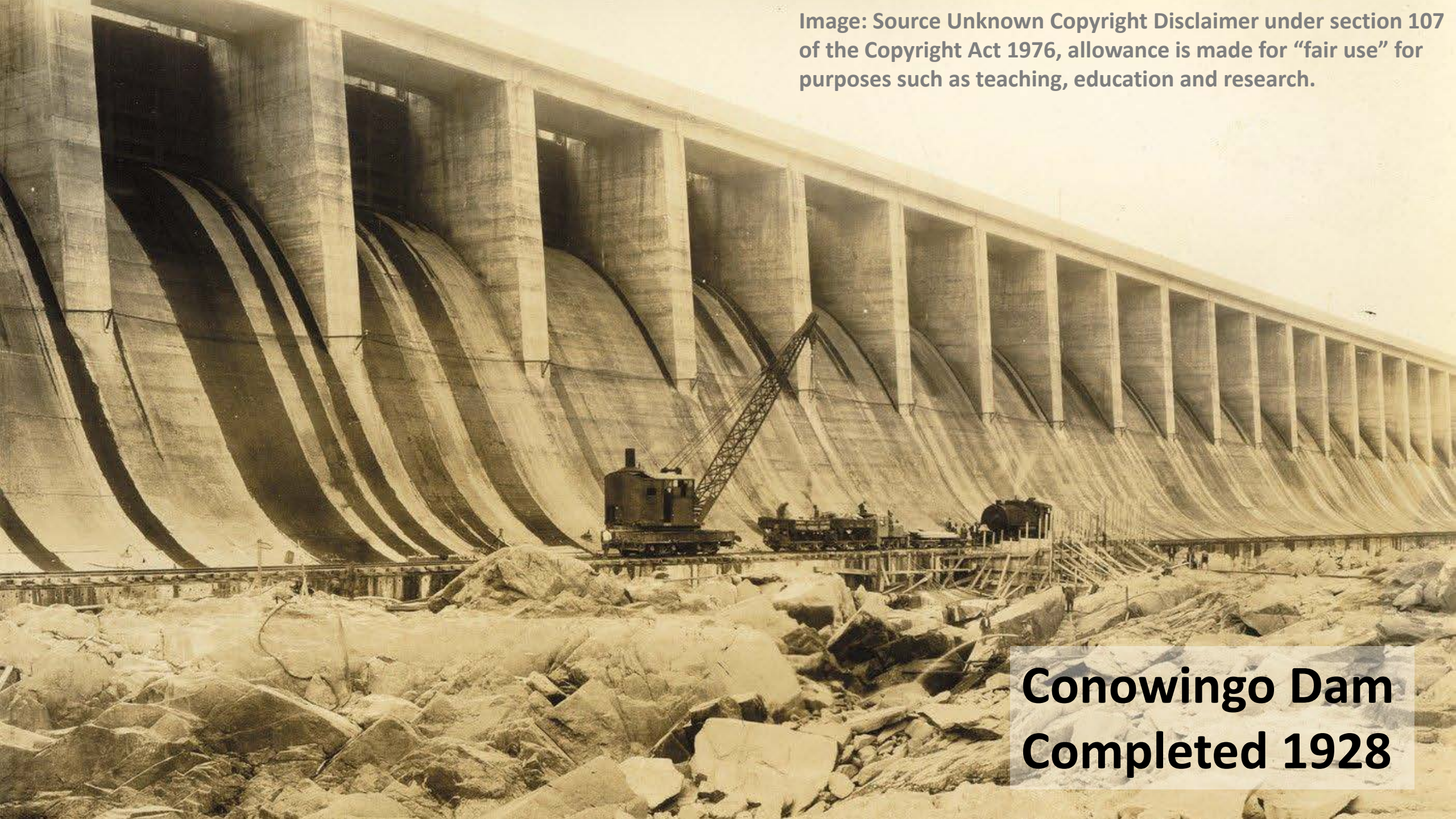


N 115 Yough Hydro-Elec. Corp. 7-3-25
Spillway Wall



**Deep Creek Dam
Completed 1925**

Image: Source Unknown Copyright Disclaimer under section 107 of the Copyright Act 1976, allowance is made for "fair use" for purposes such as teaching, education and research.



**Conowingo Dam
Completed 1928**

**Prettyboy Dam
Completed 1936**



Image: Baltimore City DPW



What's in your pond?

NAMES CHANGE, MISSION
DOESN'T

- Dept. of Water Resources
 - Combined efforts with Water Resources Commission
 - Creation led by Herb Sachs [Chapter 73, Acts of 1964 and Article 96A, Annotated Code of Maryland]
 - Included oversight of reservoir and waterway obstructions
- Board of Natural Resources
 - Absorbed the Dept. of Water Resources in 1964
- Dept. of Natural Resources
 - Replaced Board of Natural Resources in 1969
 - Dept. of Water Resources became Water Resources Administration





What's in your pond?

THE "FARM POND" ERA

“Eroded soils make for eroded people”
Dr. Hugh Hammond Bennett, First Chief of USDA SCS



Image: J.W.
Hammett, SCS

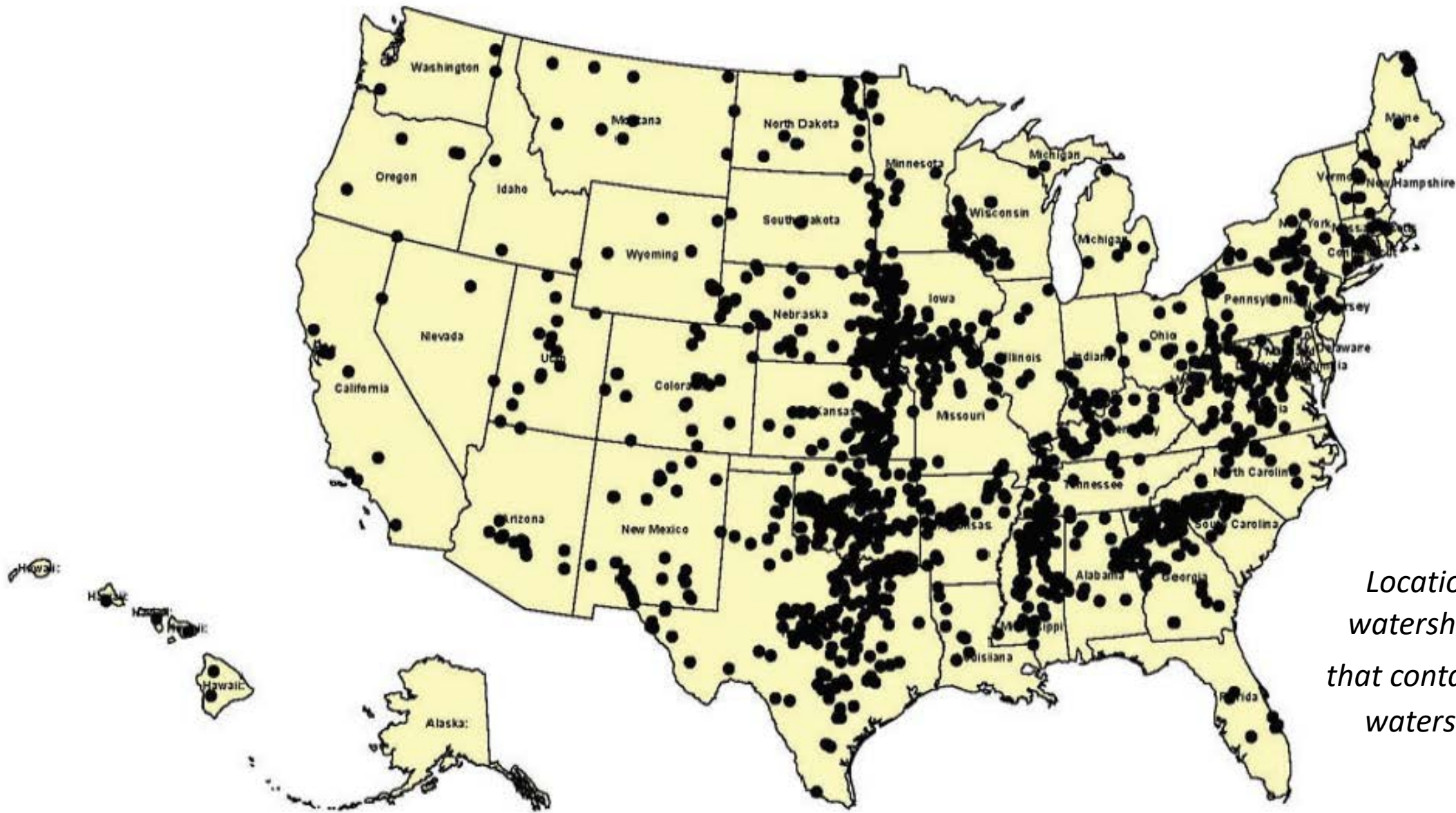
- The history of SCDs (or their predecessors) and erosion control dates back to the 1930s “dust bowl” era
 - Innovate, provide technical assistance and supervision with particular attention to erosion of farmland
 - Attention to farmers translated into farm pond design/construction for irrigation, livestock, fire suppression, fish propagation, and recreation.
- In 1960’s applicants were required to notify State of intent to build farm ponds. State issued exemptions with caveat that construction was supervised by the local Soil Conservation District
- 1969 amendments in SCD law authorized work with all people within district, not just farmland



– Signifies a shift towards “urban” issues (stormwater)

- Public Law 566, the Watershed Protection and Flood Prevention Act of 1954
 - Authorized SCS to assist soil conservation districts and other sponsors in planning and carrying out projects for watershed protection, flood prevention, sediment control, drainage and storage of water for water supply, recreation, fish and wildlife, stream flow augmentation and irrigation
- Through this work, SCS/USDA became a leading agency in design of dams/small ponds
 - Expertise flowed down to State level branches
 - NRCS has assisted in construction of over 29,000 dams (lead agency on over 11,000 of these)

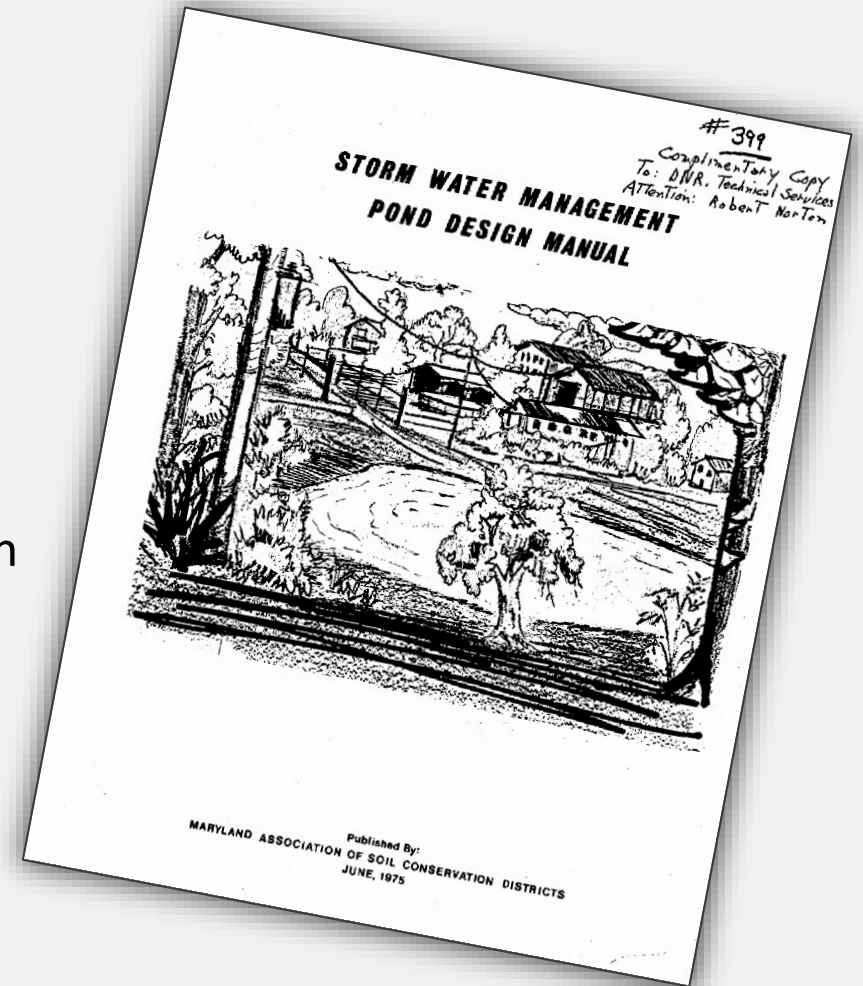




Locations of 1,333 watershed projects that contain over 11,900 watershed dams

Image: Larry Caldwell (NRCS, Ret.)

- Maryland Sediment Control Act of 1970
 - SCDs approve sediment control plans
 - MD AG interprets Act to require stormwater management as well
 - Small Pond approvals begin in accordance with “Practice Code 378” and SCS Engineering Memorandum MD-2
 - In coordination with State Water Resources Administration
- 1972 MD 378 written
 - 1977, 1981, 1991, 1992, 2000 revisions





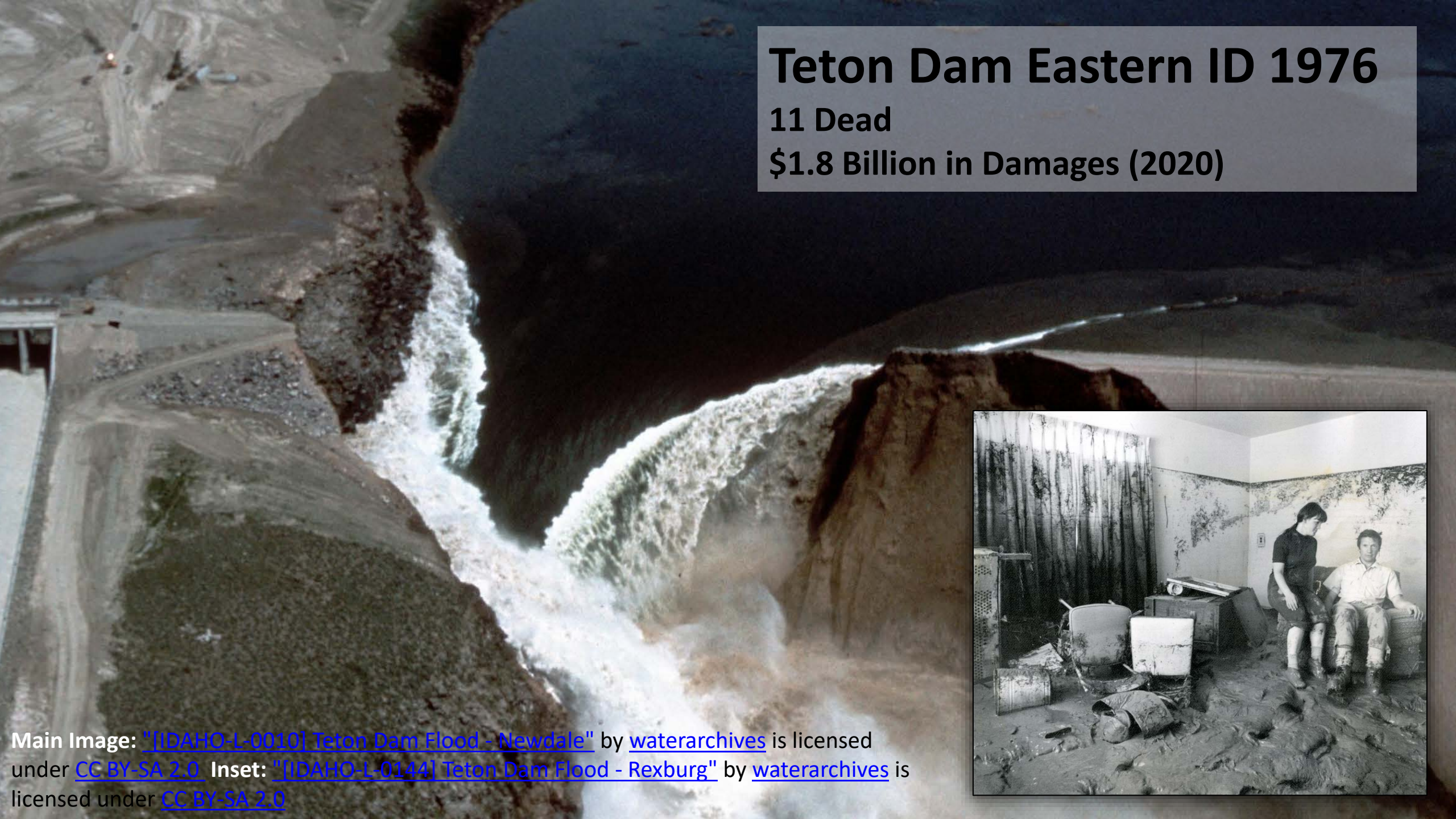
What's in your pond?

MODERNIZING DAM SAFETY

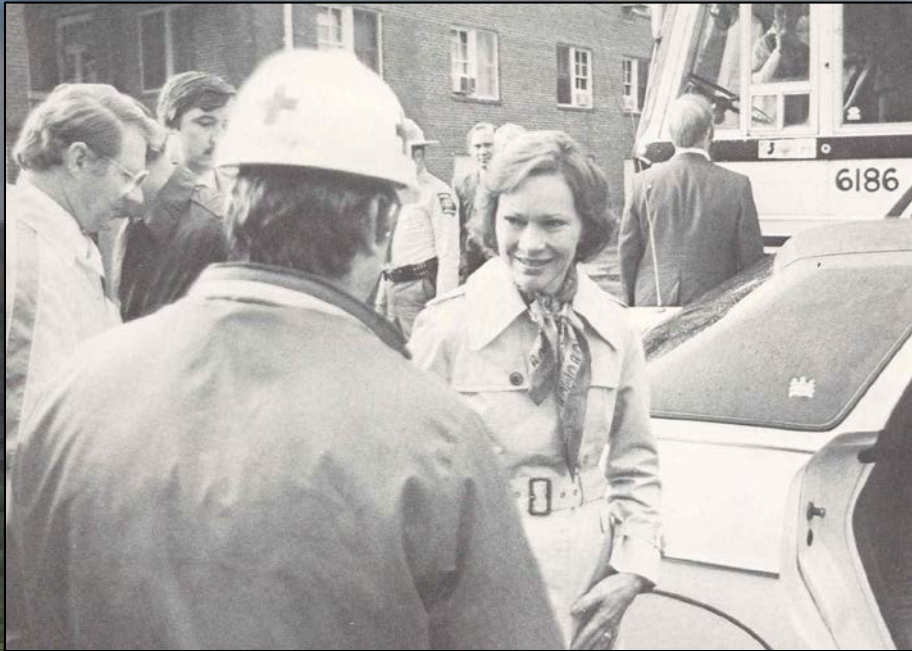
Teton Dam Eastern ID 1976

11 Dead

\$1.8 Billion in Damages (2020)



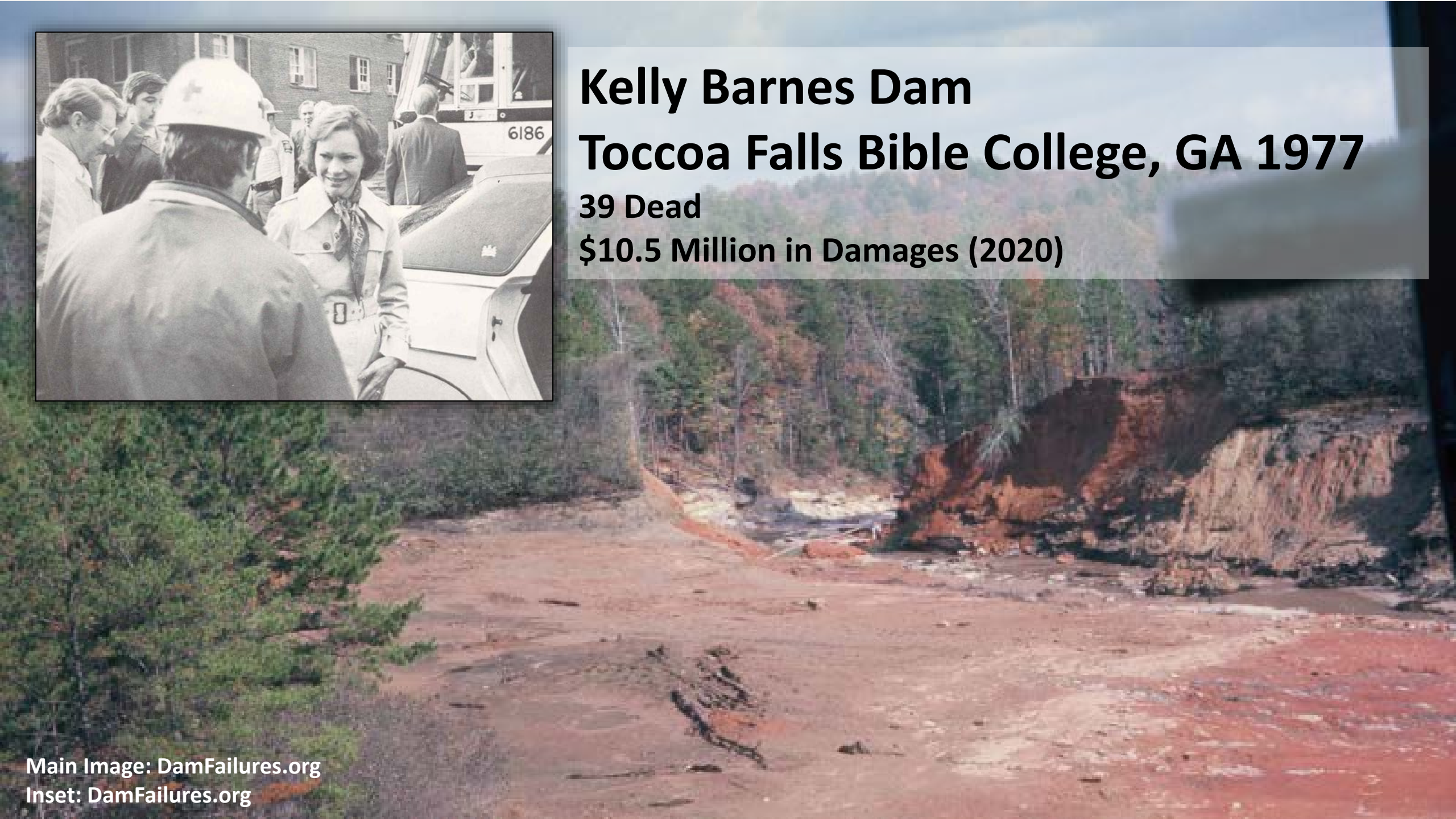
Main Image: "[[IDAHO-L-0010](#)] Teton Dam Flood - Newdale" by [waterarchives](#) is licensed under [CC BY-SA 2.0](#) Inset: "[[IDAHO-L-0144](#)] Teton Dam Flood - Rexburg" by [waterarchives](#) is licensed under [CC BY-SA 2.0](#)



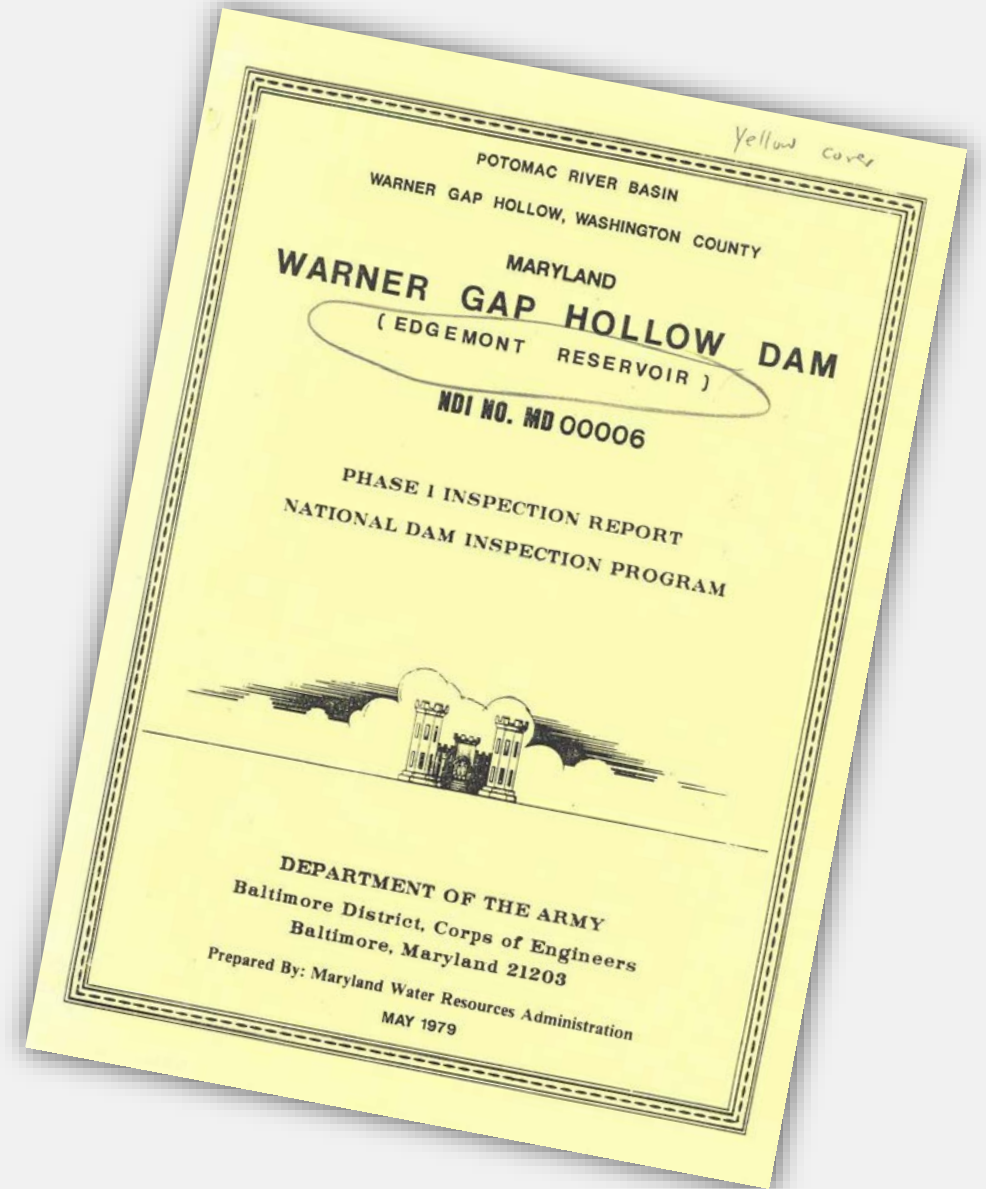
Kelly Barnes Dam

Toccoa Falls Bible College, GA 1977

39 Dead
\$10.5 Million in Damages (2020)



- National Dam Inspection Act of 1972
 - “Phase 1 inspections”
- Maryland’s Participation in National Dam Inventory began 1973
- Dam Safety Division of Water Resources Administration formed in 1978
 - Regulations revised and remain largely unchanged





What's in your pond?

THE "RETROFIT" ERA

- But first, let's remind ourselves of the current laws and regulations.
- Laws:
 - Environment Article § 5-501 through 5-514
- Regulations (COMAR):
 - 26.17.04 (broad, for permitting requirements)
 - 26.17.04.05 (specific for dams)



- "Dam" means any obstruction, wall, or embankment, together with its abutments and appurtenant works, if any, in, along, or across any stream, heretofore or hereafter constructed for the purpose of storing or diverting water or for creating a pool upstream of the dam, as determined by the Administration.

(Includes reservoir area)

- A person shall obtain, on written application to the Department, a permit from the Department to:
 - Construct, reconstruct, or repair any reservoir, dam, or waterway obstruction;
 - Make, construct, or permit to be made or constructed any change or addition to any reservoir, dam, or waterway obstruction.



- Recent legislation allows MDE to designate other entities allowed to approve small ponds
- Nothing in legislation or regulations should be considered a limitation on MDEs ultimate authority over dams, ponds and reservoirs
 - Further, nothing enables SCDs to weaken or waive requirements



Image: pngfuel.com
(open platform)

- With implementation of TMDLs and integration into the MS4 permits, retrofits are now the hot item
- This requires small pond integration in SWM review
 - Many SCDs have MD378 review MOUs
 - Is this tied into transition of SCD staff/technical expertise?
 - Is this legal?
 - Does the SCD model still work?
 - We would like to explore “why” as part of this series.



Image: purchased by author. Shutterstock

- MOUs – MDE needs to be included because regulations and guidance will change.
 - SCD integration in small pond process was accepted given resources and knowledge made available by NRCS
 - Are Counties maintaining a workforce that is current on the state of the practice locally and nationally?
- MD378 does not meet current needs.
 - Could be clearer
 - Doesn't address many current issues
 - Dam Safety Policy memos clarify acceptable design criteria in accordance with existing regulations (and apply to small ponds and most dams)





What's in your pond?

WHAT DOES THE FUTURE
HOLD?

- Intent of original dam safety laws remains valid
- Regulations have changed over time
 - But... relatively stagnant in past few decades
 - Recent ASDSO Peer Review identified areas of need to align with national Model Dam Safety Program
- Are Laws/Regulations/Policies adequate for:
 - Large linear transportation projects?
 - Ageing dam infrastructure nearing end of service life?
 - Climate change?
 - Hazard creep / risk creep?
 - Shift of technical review to local SWM agencies?



Image: pngguru.com
(open platform)



- Surveys have made it clear that:
 - You identified an issue with timeliness, clarity and consistency in direction from MDE, which can be addressed in part by policy/guidance documents.
 - Additional training on dams/small ponds is desired
 - Loss of institutional knowledge and ability to attract and retain new talent is a problem
- Some efforts have already started
 - Check out Guidelines and Policies on our website
 - Look for expression of interest link soon



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Thank You

John.Roche@Maryland.gov

410-537-3552

mde.maryland.gov/programs/Water/DamSafety



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WHAT'S IN YOUR POND?
THE UNIVERSE OF PONDS

5 Minute Break