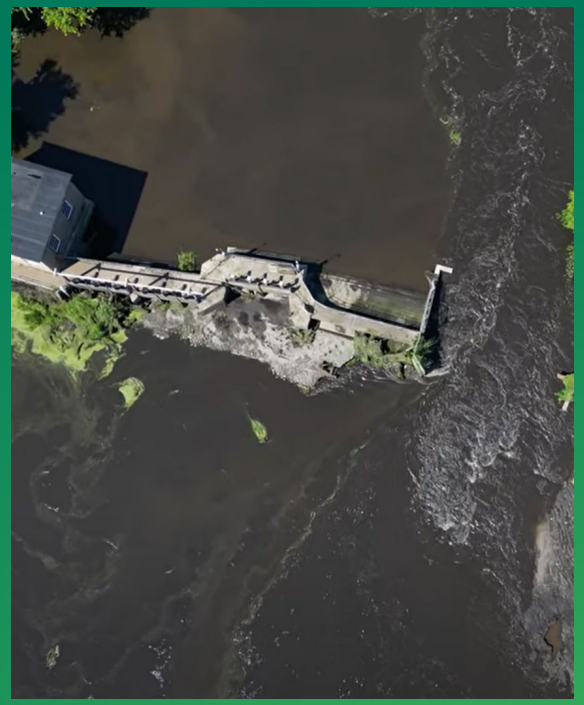
Manawa Dam Failure - July 2024



Credit : Rails 'n' Things

Generated by slow moving storms, heavy rainfall fell in four Wisconsin counties on 5th July 2024. The greatest impacts occurred in Waupaca County in Manawa City where the lake overtopped the dam and eroded the right abutment. The failure wave occurred after the rain ceased and the gate releases had been brought back under control. Impacts included property flooding and utility impacts with drinking water quality issues and hazardous floodwaters resulting. Post event issues included public safety with people sinking into the silt in the lakebed requiring rescue and the risk of wind-borne bacterial disease from entrained sediment. The dam was 104 years old according to the Manawa City website. The 176-foot crest gravity earth dam was built across the Little Wolf River for hydroelectric and recreation purposes with a full supply level of 1078 acre feet (1329ML) and a max storage of 1270 acre feet (1577 ML), 17% greater than full supply level storage. An indication of the subject matter covered is shown below, although some content is redacted. Five of the 15 learnings are summarised below.

Resources	Associated Services
• Official public presentation • Timeline • Rainfall data – unofficial • Photographic evidence • Media articles • Dam Owner comm. output • Economic assessment	• Climate Disclosure • Flood warning systems • SFARP and ALARP • Dam safety programs • Emergency Action Plans • Community education • Operation and maintenance risk
Value to managing risk in…	**Useful to**
• Public Safety • Critical Infrastructure • Governance, risk, and compliance • Climate disclosure • Critical Infrastructure • Systems and processes • SFARP/ALARP • Engineering	• Regulators • Insurance • Dam owners • Utilities • Engineering • Disaster & emergency managers • Boards

Event	Impact	Learning areas
Reliance on single rainfall depth forecast for gate operation at an unmanned dam. (Manawa City)	Unmanaged residual risk occurring in every rain event	O&M risk SFARP and ALARP Critical infrastructure Dam safety frameworks
Debris blocked gate openings causing the lake level to rise. (Fox11)	Design assumptions vs. operational outcomes were very different.	Engineering SFARP and ALARP Emergency plans and testing
Public interest: Rescues required from lakebed. (Fox11)	Ongoing public safety risk of lakebed area	Public Safety Compound risk
The wastewater treatment plant was flooded leading to pollution and a lack of potable water. (Manawa City)	Failure sparked multiple crises that were foreseeable.	Enterprise continuity Governance Risk appetite and culture
Compound risk: Mid-Western Rodeo was in occurring in Manawa – significant numbers of trainset population (Fox11)	Elevated numbers for disaster management	Climate disclosure Policy and planning. SFARP and ALARP Emergency plans and testing Compound risk

Climate Resilience