

# WISCONSIN OUTPACES MOST STATES IN RECENT DAM FAILURES

A recent dam failure in the central Wisconsin city of Manawa raised broader questions about the condition of the more than 4,000 dams across our state. As extreme rain events have become more frequent in the 21<sup>st</sup> century, Wisconsin ranks second nationally in the number of documented dam failures since 2000, with most happening in just the last few years. However, the rating of our state’s most critical dams has improved since 2019.

Wisconsin is home to more than 4,000 dams spread across all of its 72 counties. They range from massive hydroelectric concrete dams, such as the Prairie du Sac Dam on the Wisconsin River, to small earthen dams that create farm ponds. As these dams age and rain events become more extreme, there is debate about whether some should be improved or removed.

While the state devotes considerable resources to inspecting and maintaining its dams, if rainfall and weather events are extreme enough, they can fail. According to data from the Association of [State Dam Safety Officials](#), (ASDSO) from 2000 through 2023, Wisconsin recorded 34 dam failures, the second-most

nationally behind South Carolina. It is important to note that these rankings could be affected by state-to-state differences in dam inspection and reporting practices, potentially including the number of dam failures that states report to the ASDSO.

Nonetheless, these data make clear that dam failures in Wisconsin also are becoming more frequent, with 28 of the 34 happening since 2018. More than half, or 18, have occurred since 2020.

Most of these dam failures did not have catastrophic consequences: none resulted in loss of life, and none caused property damage exceeding \$100,000. However, initial reports indicated the recent Manawa dam failure and the rainfall event that caused it

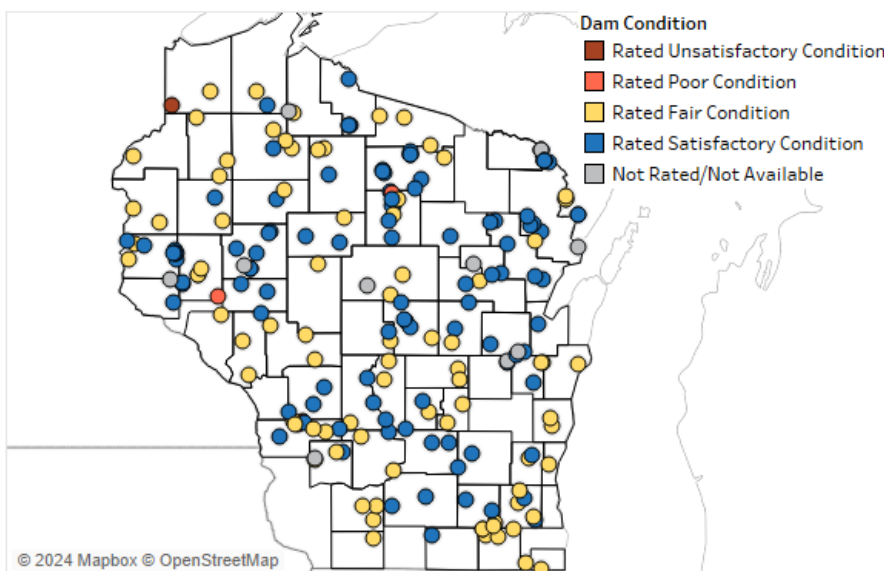
resulted in the evacuation of about 100 nearby residents and is projected to have caused about [\\$6 million in property damage](#). When fully accounted for, the Manawa dam failure may be the state’s costliest since 2000, and likely earlier.

Notably, the Manawa dam is classified in the lowest of three hazard potential categories. But for many other Wisconsin dams, the stakes would be even higher if they failed.

Here we examine the condition of Wisconsin’s dams, how they have changed over time, and how they compare to those in other states. We also look at who is responsible for inspecting and maintaining dams across our state. We rely on data from Wisconsin’s Department of Natural

**Figure 1: Few of Wisconsin’s 206 High Hazard Dams Are in Poor or Unsatisfactory Condition**

High hazard dam condition rating, National Inventory of Dams



Source: Army Corps of Engineers National Inventory of Dams

Resources (DNR), the U.S. Army Corps of Engineers, and ASDSO.

## CLASSIFYING DAMS

Just over 1,000 Wisconsin dams are listed on the Army Corps' National Inventory of Dams (NID). They vary considerably in their size and purpose, though generally they consist of the state's largest dams and those with the highest potential consequences in the event of a failure.

Usually of earthen or concrete construction, these dams range from six feet in height to the 92-foot tall Flambeau dam, a hydroelectric structure on the Dairyland Reservoir in Rusk County. They are capable of storing volumes of water ranging from none (so-called dry dams that are built only for flood control and do not typically contain any water except after large rain events) to massive water bodies.

Of the 1,004 Wisconsin dams listed on the recently updated national inventory, nearly half, or 471, are maintained for the primary purpose of promoting recreation. Other primary purposes include hydroelectric power generation, flood risk reduction, fire protection, fishing, and irrigation.

A dam failure is an unintended release of water from the body that the dam controls. It could mean a catastrophic situation similar to the collapse of a highway holding back [Lake Delton](#) in 2008, when the entire lake was drained to its bed and five houses were destroyed, or a much less consequential event in which a dam is overtopped or releases a small amount of water downstream.

For any dam, the consequences of failure depend in part on how much water it holds back and what lies downstream. The Army Corps' national inventory classifies dams into three categories of downstream hazard potential – low, significant, or high.

Dams assigned high hazard potential are those for which “failure or mis-operation will probably cause loss of human life,” according to the inventory. Typically, these are large dams with at least one person in a housing unit downstream that could be flooded if the dam collapsed.

Dams with significant hazard potential are those for which failure or mis-operation “can cause economic

loss, environmental damage, disruption of lifeline facilities, or impact other concerns.” These can be located in rural areas or more populous areas. Dams with low hazard potential are those for which failure or mis-operation would result in no probable loss of human life and low economic or environmental losses.

Of Wisconsin's more than 1,000 dams listed on the national inventory, just over 200 are classified as “high hazard.” Wisconsin ranks 27<sup>th</sup> nationally in its total number of high hazard dams. Figure 1 on the previous page shows how these dams are distributed across the state, and their condition.

Of the 34 dam failures that occurred in Wisconsin over the last 23 years, three were high hazard potential dams and one was a significant hazard potential dam. Eighteen were low-hazard potential dams, and the remainder were undetermined, meaning their hazard potential either had not been designated or was not provided to the Army Corps.

To contextualize these numbers, it's helpful to understand how Wisconsin's total dam inventory compares to other states. Despite its abundance of lakes and rivers, Wisconsin ranks just 30<sup>th</sup> in its total number of dams in the national list. This inventory includes all high and significant hazard potential dams, as well as all low hazard potential dams that meet height and reservoir storage requirements.

Notably, the number of high hazard potential dams has increased over time – with the total number of high hazard potential dams nationwide more than doubling during the last two decades, according to the American Society of Civil Engineers. This is likely due to “development steadily (encroaching) on once rural dams and reservoirs,” the society wrote in [a 2021 infrastructure report card](#).

The same trend has occurred in Wisconsin, albeit at a somewhat less dramatic pace. From 1994 to 2024, the number of high hazard potential dams in Wisconsin increased from 177 to 206, the inventory shows. It's possible that the increase is due to improved data about these dams.

## DAM INVENTORY AND CONDITION

Available data indicates that Wisconsin's high hazard potential dams are in better condition than their counterparts in most other states. Dam inspectors, such



as those employed by the Wisconsin DNR, periodically inspect the condition of dams, with their findings compiled as part of the national inventory.

Of Wisconsin’s 206 high hazard potential dams, five were found to be in poor or unsatisfactory condition, according to the most recent data. This amounted to about 2.4% of the state’s high hazard dams. This marks an improvement for Wisconsin relative to 2019, when 10.1% of the state’s high hazard potential dams were in poor or unsatisfactory condition.

Comparing this to other states can be challenging because condition data are not available for all dams, and in some states, data are not available for a sizable share – or even a majority – of high hazard potential dams. As of August 2024, condition data were not available for at least 10% of high hazard dams in 35 states, and at least 25% of those dams in 15 states.

Figure 2 shows that Wisconsin ranks eighth lowest in the country in the share of its high hazard dams that are in poor or unsatisfactory condition. If we omit the 15 states with at least 25% of dams unrated, Wisconsin’s ranking jumps to third lowest.

Wisconsin also modestly improved during this period in its total share of high hazard potential dams for which condition assessment data are available. In 2019, such data were not available for 10.1% of the state’s high hazard dams; by this year, that share declined to 6.3%.

Unfortunately, it is not possible to directly analyze long-term changes in dam conditions because the national

data are not available for the years prior to 2019. These data were included in the NID, but cannot be shared directly with the public. However, U.S. Army Corps officials were able to share that between 2009 and 2013, only 25% of Wisconsin high hazard dams had condition ratings, but by 2015, that portion had grown to 95% of all high hazard dams. This shows an effort by state officials and dam owners to ensure dam conditions were up to date, including changes to state law requiring regular inspections.

## DAM OWNERSHIP

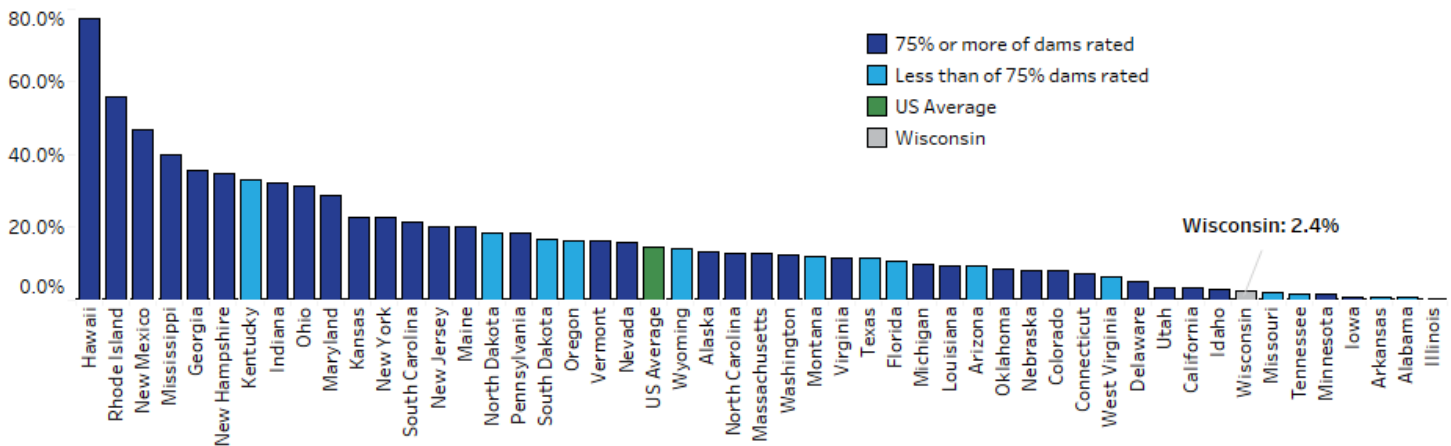
Wisconsin’s dams are owned by a mix of private individuals, companies, government or tribal entities, and public utilities. Among the state’s more than 1,000 dams in the national inventory, about 40% are owned by local governments, while 29% are privately owned, 13% are state-owned, 9% are owned by a public utility, and 7% are federally owned, with the remainder having a mix of ownerships. Among the state’s high hazard potential dams, nearly half (48%) are owned by local governments.

Regulation of Wisconsin dams primarily falls to the DNR. However, the federal government has jurisdiction over most of the nearly 200 large dams in Wisconsin that produce hydroelectricity.

While responsibility for maintaining these dams ultimately falls to the dam owners, the state provides grants to local governments for dam safety work. Since 2009, every two-year state budget has provided at least

**Figure 2: Wisconsin’s Dams Are in Better Condition Than Those in Most Other States**

Percent of high hazard dams in poor or unsatisfactory condition by state



Source: National Inventory of Dams



\$4 million for these grants, with a one-time increase to [\\$10 million](#) in the 2021 budget.

As part of his 2023-25 budget plan, Gov. Tony Evers proposed maintaining the \$10 million two-year funding level. However, the Legislature’s budget-writing Joint Finance Committee pared back the funding to the \$4 million allotted in prior two-year budgets. Additional funds have also been allocated to specific dam projects through the state budget.

## WHAT TO DO WITH WISCONSIN’S DAMS

Many Wisconsin dams play vital roles producing electricity, providing recreational opportunities, and helping to limit flooding. But some have outlived their usefulness, like the [Estabrook Dam in Milwaukee County](#), and have been removed from the landscape.

Other communities are pondering whether to remove aging dams in need of repair instead of making expensive upgrades. For example, Vernon County has plans to remove or decommission [up to 23 dams](#) after a massive 2018 rainstorm resulted in a number of dam failures. In Minnesota, local officials are moving to [demolish a dam](#) near Mankato that failed during an extreme rainfall event in June.

These dam removals can have positive benefits for both community budgets and [fish and wildlife communities](#) -- especially for species such as sturgeon and some types of trout that depend on free-flowing rivers for spawning. However, some [community members](#) are concerned about how dam removal could impact flooding in their area. Since 2000, 25 dams have been removed across the state, including two high hazard dams.

## CONCLUSION

Dams are an essential part of the state’s water infrastructure. With many over 50 years old, they will need continued or increased investment in the years to come. In some parts of the country, increases in dam safety funding and staffing have come only in the [wake of disaster](#).

Our analysis suggests that recent funding levels have been sufficient to improve the condition of the state’s most critical dams since 2019. However, the state has also experienced more dam failures in recent years, and a changing climate – triggering more frequent and more

severe extreme rain events – could pose new and greater tests to our dam infrastructure.

In the years to come, state and local leaders face difficult choices about where to invest in maintaining and improving dams to weather future floods and where to consider removing them altogether from the landscape.

