DAM REMOVALS THAT FACED MAJOR PROBLEMS.

Common Patterns in "Failures"

1. Contaminated sediment underestimated (PCBs, heavy metals)
2. Short-term ecological damage greater than predicted
3. Local economic decline after reservoir loss
4. Political division and lawsuits
5. Engineering miscalculations about sediment transport
6. Important Perspective
7. Even projects labeled "failures" often show long-term ecological improvement after initial disruption. The main lesson globally:
8. Dam removal is less about demolition and more about sediment science, hydrology, and community transition planning.
9. Here are several dam removal projects that faced major problems, ranging from environmental damage to flooding and political backlash. These cases don't mean dam removal is always bad — many projects succeed — but they show how complex it can be.

1. San Clemente Dam (California, USA)

Removed: 2015

- Issue: Massive unexpected sediment release
- The project diverted the river to avoid releasing millions of cubic yards of sediment at once.
- However, storms after removal moved large amounts of sediment downstream, affecting habitats and raising concerns about water quality and steelhead trout survival.
- Considered technically successful, but sediment management proved more difficult than expected.

2. Marmot Dam (Oregon, USA)

Removed: 2007

- Issue: Rapid sediment surge
- About 750,000 cubic yards of sediment were released.
- While the river eventually stabilized, the initial sediment wave dramatically altered downstream channels and fish habitat.
- It's now considered mostly a long-term success, but the short-term impacts were intense.

3. Elwha Dam & Glines Canyon Dam (Washington, USA)

Removed: 2011–2014

- Issue: Massive sediment release and infrastructure damage
- Released ~30 million tons of sediment — one of the largest in history.
- Turbidity spikes affected fish and required temporary water treatment changes.
- Some private wells were damaged, and riverbanks eroded unpredictably.
- Ecologically, salmon rebounded dramatically — but the transition period was chaotic and expensive.

4. Edenville Dam (Michigan, USA)

- Failed before planned improvements (2020)
- This wasn't a removal — but poor maintenance and regulatory disputes led to catastrophic failure.
- Heavy rains caused collapse, flooding Midland, Michigan.
- Illustrates how delaying removal or upgrades can be worse than proactive action.

5. Klamath River Dam Removal (Oregon–California, USA)

Ongoing (largest U.S. removal project)

- Concerns include:
- Toxic algae blooms
- Short-term water quality decline
- Tribal, agricultural, and power supply conflicts
- Early stages saw fish die-offs linked to disease and stress during transitional phases.
- Long-term ecological outcomes are still developing.
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Common Problems in "Bad" Dam Removals

- Sediment shock – Decades of trapped sediment rush downstream.
- Fish kills – Due to turbidity, oxygen depletion, or disease.
- Unexpected flooding – Channel instability after removal.
- Community backlash – Loss of reservoirs used for recreation.
- Underestimated cost overruns – Restoration is often more complex than projected.

United States

1. Whittenton Dam (Massachusetts, USA)

Removed: 2013

- Issue: Severe short-term riverbank erosion
- After removal, rapid channel downcutting destabilized nearby infrastructure.
- Emergency stabilization work was required, increasing costs.
- Local opposition grew due to muddy water and altered river appearance.

2. Gold Ray Dam (Oregon, USA)

Removed: 2010

- Issue: Sediment and algae impacts
- Release of nutrient-rich sediment temporarily worsened water quality.
- Local recreation and fishing businesses complained of short-term economic losses.
- Outcome: River eventually stabilized, but short-term disruption was greater than predicted.

3. Fort Edward Dam (New York, USA)

Removed: 1973

- Issue: PCB contamination
- Removal mobilized contaminated sediments from decades of industrial pollution.
- Toxic PCBs moved downstream, worsening contamination concerns.
- Later required massive cleanup efforts by General Electric.
- Why it's cited:: One of the earliest examples showing that sediment contamination can make dam removal environmentally risky.

4. Vezins Dam (France)

Removed: 2019

- Issue: Political backlash & sediment concerns
- Farmers and residents feared flooding and economic loss.
- Significant public protests delayed removal.
- Sediment release required careful phased drawdown.
- Outcome: Ecological recovery underway, but remains politically divisive.

5. Sélune Dam Removal Project (France)

- Includes removal of both Vezins and La Roche-Qui-Boit dams.
- Issue: High cost and divided public opinion
- Critics argue hydropower loss outweighed ecological gains.

6. Sanmenxia Dam (Partial functional failure leading to major redesign)

Built: 1960

- Severe sedimentation quickly reduced reservoir capacity.
- Massive upstream flooding and relocation of residents occurred.
- Required expensive redesign and reconstruction.
- Not technically a removal, but often cited as a case where sediment miscalculation caused long-term engineering failure.

7. Arase Dam

Removed: 2012–2018

- Issue: Cost overruns & local economic impact
- Hydropower revenue was lost.
- Debate over whether ecological recovery justified expenses.

Worst Environmental Damage Linked to a Dam Removal

Fort Edward Dam (1973)

- This is widely considered the most environmentally problematic dam removal in U.S. history.
- What Went Wrong
- The dam had trapped PCB-contaminated sediment from upstream manufacturing.
- When the dam was removed, large amounts of toxic sediment were mobilized.
- PCBs spread downstream through the Hudson River.
- Fish became heavily contaminated.
- Commercial fishing bans lasted decades.
- The contamination stemmed largely from discharges by General Electric plants upstream.

Long-Term Impact

- The river became one of the largest Superfund cleanup sites in U.S. history.

- Massive dredging operations occurred between 2009–2015.
- Cleanup costs exceeded $1.5 billion.
- Why This Case Matters
- This project taught regulators that:
- Sediment testing is absolutely critical before removal
- Removing a dam can unintentionally mobilize legacy industrial pollution
- It fundamentally changed dam-removal permitting standards in the U.S.

The science of sediment shockwaves after removal

This is called internal nutrient loading.

- Nutrient Release Mechanism
- Reservoir bottoms accumulate:
- Phosphorus
- Nitrogen
- Decaying organic matter
- When the water level drops:
- Sediments become exposed to oxygen
- Chemical reactions release bound phosphorus
- Rain events wash nutrients downstream
- Water warms in newly shallow areas
- Algae respond explosively