New Jersey's New Dam Disclosure Law:

From Disclosure to Better Dam Stewardship

Engineering Perspectives Following Enactment of New Jersey's Dam-Disclosure Law

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Highlights

- **The law reveals; it does not create.** A deteriorating dam is a responsibility whether or not it is disclosed. Disclosure makes it visible before a sale.
- **It helps buyers and current owners.** Buyers learn what they are taking on. Owners are prompted toward inspection and preventive maintenance.
- **The adopted law now explicitly defines "dam."** The introduced bill did not define the term. The enacted law uses a 5-ft water-level-rise criterion that is substantially the same as the longstanding definition in New Jersey's Dam Safety Standards, N.J.A.C. 7:20. This criterion should not be confused with the separately defined regulatory measurement of "height-of-dam." Thus, the 5-ft criterion is not new to New Jersey dam-safety regulation; what is new is its explicit inclusion in the 2026 dam-disclosure law.
- **The 5-ft regulatory concept has deep roots in New Jersey.** New Jersey began regulating dam construction, repair, and inspection in 1912; the law was strengthened and became known as the Safe Dam Act in 1981, and the Dam Safety Standards, N.J.A.C. 7:20, followed in 1985.
- **The Pinelands exception is narrow and combined.** A dam there is excluded only if it raises the waters of a river or stream less than 8 ft above the ground surface, drains less than 1 square mile, and creates a water surface of less than 100 acres. A dam meeting the general 5-ft criterion can therefore still qualify for the exception.
- **Hazard class is not condition.** Classes I–III primarily describe the potential consequences of failure, while Class IV combines small-dam size criteria with the requirement that the dam not meet Class I or II criteria. A high-hazard dam can be well maintained; a low-hazard dam can be in poor condition.
- **Different inventories serve different purposes.** The U.S. Army Corps of Engineers' National Inventory of Dams, New Jersey's dam-safety records, and inventories of low-

head or other small barriers do not represent exactly the same universe of structures. Absence from one inventory does not necessarily mean that a structure is unknown.

- **The State Auditor's 1,728-dam figure has a specific scope.** It represents Class I–III dams in the Bureau of Dam Safety database as of April 2024. Class IV dams follow a different regulatory and reporting pathway. Their absence from that published Class I–III total should not be interpreted as evidence that they are generally unknown to NJDEP or other governmental entities.
- **Smaller barriers remain important even when they fall outside the disclosure-law definition.** Low-head dams, old mill structures, pond embankments, and other barriers may matter for stream restoration, fish passage, recreational safety, local hydraulics, historical resources, or other purposes. The broader "hidden dam" issue discussed in my March 2026 brief therefore remains relevant, but it should not be conflated with the particular universe covered by the new disclosure law.
- **Inventory gaps can occur, but their present scale should not be assumed.** Seven dams that failed during the 2004 New Jersey storms had not previously been recorded in the Department's database. That historical experience is important, but it does not establish a large present-day gap in dams subject to the disclosure law.
- **Modern technology can supplement existing information.** LiDAR, GIS, aerial and satellite imagery, machine learning, and AI can help reconcile records and identify candidate structures—particularly old, small, modified, or poorly documented barriers—but should not be interpreted as evidence that New Jersey must rediscover its regulated dams from scratch.
- **A dam can look fine and still have serious problems.** Seepage, internal erosion, gate and outlet reliability, and spillway capacity often cannot be judged by eye. Professional assessment matters.
- **Costs vary enormously.** Simple disclosure may cost little. Engineering studies, repairs, rehabilitation, and removal can become expensive. A USGS analysis of 668 removals found median reported removal costs of approximately $157,000, $823,000, and $6.2 million for dams in three increasing height ranges.
- **Disclosure does not solve funding.** Owners of deteriorating private dams may still face large costs. Financing and cost-sharing deserve attention, especially where a private dam also protects downstream people, roads, utilities, or other public interests.
- **Dams are not only liabilities.** Depending on the site, they can provide water supply and storage, irrigation, hydropower, flood control and flood-risk reduction, recreation, habitat, historical and cultural value, and aesthetic benefits. Decisions should therefore extend beyond a simple "keep or remove" choice.

Overview

On August 14, 2026, *NJ.com* published an article on New Jersey's newly enacted dam-disclosure law, which requires sellers of residential property to disclose specified information when a dam is located wholly or partly on the property. The article describes the experiences of New Jersey homeowners who unexpectedly encountered substantial responsibilities and costs associated with dams and discusses what the new law may mean for future buyers and sellers.

I was interviewed for and quoted in the article as a professor of civil and environmental engineering at Rutgers University. Among the points I discussed were the value of disclosure to prospective buyers, the importance of professional dam assessments rather than relying on visual appearance alone, and the additional stresses that extreme rainfall can place on aging dams. The article highlighted these points in its discussion of the new law.

This reflection complements my earlier March 2026 brief, *When a Homeowner Discovers a Dam*, prepared while the legislation was still being considered. That brief focused particularly on hidden dams, homeowner responsibilities, field identification, and modern methods for screening possible dams and embankments. It also discussed the broader population of small and low-head barriers that may not appear in conventional dam-safety inventories.

An important development between the introduced and enacted legislation is that the final law now explicitly defines what constitutes a "dam." That clarification makes it useful to distinguish between **dams subject to the new disclosure law** and the **broader universe of smaller dams, low-head barriers, pond embankments, and other artificial barriers that may be important for different engineering, environmental, historical, or recreational-safety purposes**.

The present reflection therefore shifts the discussion from whether disclosure is desirable to how the enacted law can be implemented effectively and how its particular definition of a dam fits within the broader landscape of dam regulation, records, and stewardship.

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1. Why Dam Disclosure Matters

The problem addressed by the new law is straightforward but consequential: a person may purchase property without fully appreciating that a pond, earthen embankment, or other landscape feature includes a dam—and that ownership of the property may bring responsibilities extending well beyond ordinary landscaping.

Depending on the dam and its classification and condition, ownership can involve inspection, maintenance, engineering evaluation, repair, rehabilitation, emergency planning, or eventually removal.

The *NJ.com* article illustrates two somewhat different information problems. One homeowner reported discovering the dam only after purchasing the property. Another knew that a dam was present but said he had not understood the seriousness of its longstanding condition.

These cases illustrate why disclosure should involve more than simply checking a box saying "there is a dam."

A prospective buyer should, where applicable, be able to learn:

- that a dam exists;
- its hazard classification;

- available inspection information;
- known deficiencies;
- applicable owner responsibilities; and
- potentially significant future maintenance or repair obligations.

The enacted legislation specifically requires the property condition disclosure statement to address whether a dam is located wholly or partly on the property, its hazard classification, applicable inspection results, and State-law obligations that a purchaser would assume.

The disclosure law therefore helps reduce an important information imbalance between sellers and prospective buyers.

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2. Disclosure Can Also Benefit Current Dam Owners

Although disclosure is naturally viewed as consumer protection for buyers, I believe it can also benefit current dam owners.

The process can prompt an owner to determine whether the structure is documented in NJDEP or other appropriate governmental records, understand its classification, review available inspection information, and become more aware of inspection and maintenance responsibilities.

That awareness can encourage preventive maintenance.

A relatively minor erosion problem, obstructed outlet, animal burrow, excessive vegetation, deteriorating concrete, developing seepage condition, or mechanical problem may be much less expensive to address when identified early than after it develops into a major repair or safety problem.

The potential progression is:

Disclosure → awareness → inspection and maintenance → earlier identification of deficiencies → timely repair → potentially lower long-term costs and reduced failure risk

Thus, disclosure should not be viewed only as an obligation imposed when a property is sold. It can contribute to better stewardship of the dam while the current owner still owns it.

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3. What Exactly Counts as a “Dam”? Understanding the Five-Foot Threshold

One improvement in the enacted legislation is greater clarity concerning what constitutes a dam.

The introduced bill required disclosure of a "dam" but did not itself define the term. The amended and enacted legislation added an explicit definition that closely follows the definition already used under New Jersey's existing Dam Safety Standards, N.J.A.C. 7:20.

Thus, the **5-ft water-level-rise criterion is not new; what is new here is its explicit inclusion in the dam-disclosure law.**

That distinction is reinforced by New Jersey's regulatory history. State legislation concerning the construction, repair, and inspection of dams dates to **1912**. The law was amended in **1981** and became known as the Safe Dam Act, and the Dam Safety Standards, N.J.A.C. 7:20, were promulgated in **1985**.

The 5-ft criterion therefore should not simply be described as "a dam five feet high." The statutory language concerns the amount by which an artificial barrier raises the water level.

The law defines a dam as an artificial dike, levee, or other barrier, together with appurtenant works, constructed to impound water permanently or temporarily, that raises the water level **5 ft or more above the usual mean low-water height**, measured from the downstream toe-of-dam to the emergency-spillway crest or, if there is no emergency spillway, to the top-of-dam.

N.J.A.C. 7:20-1.2 uses essentially the same definition. It separately defines **"height-of-dam"** as the vertical dimension from the lowest point in the streambed or ground surface at the downstream toe of the dam to the elevation of the top of the dam, without camber. It also separately defines **"toe-of-dam"** as the junction of the downstream face of the dam with the ground surface or the invert of the outlet pipe, whichever is the lowest point.

The 5-ft water-level-rise criterion and the separately defined height-of-dam therefore should not be casually interchanged.

Question	Applicable regulatory measurement
Does the structure meet the general definition of a "dam"?	The structure must raise the water level 5 ft or more above the usual mean low-water height, measured from the downstream toe-of-dam to the emergency-spillway crest, or to the top-of-dam if there is no emergency spillway.
What is the "height-of-dam"?	The vertical dimension from the lowest point in the streambed or ground surface at the downstream toe of the dam to the top-of-dam.
What is the "toe-of-dam"?	The junction of the downstream face of the dam with the ground surface or the invert of the outlet pipe, whichever is the lowest point.

This distinction also explains why a homeowner should not simply look at an embankment and decide that it "looks about four feet high" and therefore is outside the law.

For a borderline structure, a reasonable progression would be:

Check available NJDEP information → contact NJDEP if necessary → obtain professional measurement or engineering assistance where uncertainty remains → document the determination

Indeed, the enacted legislation specifically provides that sellers and purchasers may contact the NJDEP Bureau of Dam Safety for assistance in determining whether a dam is subject to the Safe Dam Act or associated regulations.

This is also consistent with an informal conversation I had with the Chief of the NJDEP Bureau of Dam Safety in April 2026, in which he indicated that an owner or prospective purchaser uncertain whether a property contains a dam could contact the Bureau for assistance. Because that conversation was informal, I cite it here only as context rather than as an official agency statement.

Clear diagrams and examples from the State explaining the measurements could further make implementation easier for homeowners, real-estate professionals, surveyors, and engineers.

The law also contains a special provision for certain dams within the Pinelands Area.

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4. A Special Pinelands Exception

The new law includes a special exception for certain dams located within the Pinelands Area.

Under the statutory language, the term “dam” does not include a dam in the designated Pinelands Area when all three of the following conditions are satisfied:

- the dam raises the waters of a river or stream less than 8 ft above the surface of the ground;
- the drainage area above the dam is less than 1 square mile; and
- the water surface created by the dam is less than 100 acres.

This provision is important because the general definition uses a water-level rise of 5 ft or more, whereas the Pinelands exception uses a combination of water-level rise, drainage area, and water-surface area.

Consequently, a structure in the Pinelands can meet the general statewide 5-ft criterion but nevertheless be excluded from the definition under the special Pinelands provision. For example, a structure that raises the waters of a river or stream by 6 or 7 ft could fall within the exception if its drainage area is less than 1 square mile and the resulting water surface is less than 100 acres.

Conversely, satisfying only one or two of these conditions is not sufficient for the exception. The statutory language connects all three.

For purposes of understanding the disclosure law:

The law generally defines a dam using a water-level rise of 5 ft or more, while providing a special Pinelands exception based on three combined criteria: water-level rise, upstream drainage area, and the water-surface area created by the dam.

This is another reason that a property owner should not determine whether a structure is subject to disclosure merely by estimating its apparent physical height.

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5. Hazard Classification Is Not the Same as Dam Condition

New Jersey classifies dams primarily according to the potential consequences if the dam fails, not according to whether the dam is presently in good or bad condition.

This distinction is fundamental.

Class I — High Hazard Potential. Failure may result in probable loss of life or extensive property damage. There is no single height, storage-volume, or drainage-area threshold that makes a dam Class I; the classification is principally consequence-based.

Class II — Significant Hazard Potential. Failure may cause significant damage to property and project operation, although loss of human life is not envisioned. Again, no single numerical dam size defines Class II.

Class III — Low Hazard Potential. Failure would cause loss of the dam itself but little or no additional damage to other property. Class III likewise is primarily consequence-based rather than defined by one dimensional threshold.

Class IV — Small Dams. Class IV differs because it contains explicit small-dam criteria. Under N.J.A.C. 7:20-1.8, a Class IV project:

- impounds less than 15 acre-ft of water to the top of dam;
- has less than 15 ft height-of-dam;
- has a drainage area of 150 acres or less; and
- may not be included in Class IV if it meets the Class I or Class II criteria.

Spillway design requirements also vary by dam class. Under N.J.A.C. 7:20-1.9, the minimum spillway design storms are:

Dam class	Minimum spillway design storm
Class I — High Hazard	Probable Maximum Precipitation (PMP)
Class II — Significant Hazard	One-half PMP
Class III — Low Hazard	24-hour, 100-year Type III storm
Class IV — Small Dam	24-hour, 100-year Type III storm plus 50%

N.J.A.C. 7:20-1.9 also allows later storm technology adopted by the USDA Natural Resources Conservation Service to be substituted for the Type III storm methodology.

Notably, the regulation prescribes a larger design storm for Class IV dams than for Class III dams: the 24-hour, 100-year storm plus 50%, rather than the 24-hour, 100-year storm. Class IV dams nevertheless qualify for a permit-by-rule rather than the conventional NJDEP dam-permit process, provided they satisfy the applicable requirements of N.J.A.C. 7:20.

The central distinction is:

Hazard classification describes the consequences of failure. Condition describes how well or poorly the dam is performing today.

A Class I high-hazard dam can be very well maintained and in excellent condition. Conversely, a low-hazard or small dam can be in poor physical condition.

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6. A Dam Can Look Fine and Still Have Serious Problems

This was one of the issues I emphasized during my *NJ.com* interview, and the published article noted the importance of professional assessment rather than relying solely on appearance.

A visual walk-around is valuable. An observer may notice erosion or gullies, cracks or settlement, displaced riprap, excessive trees and vegetation, animal burrows, deteriorated concrete, obvious seepage, clogged outlets, damaged spillways, or other visible abnormalities.

But visual appearance alone cannot establish that a dam is safe.

Seepage and internal erosion

This is particularly important for earthen dams.

Water naturally moves through and beneath an earth embankment. The engineering question is whether that seepage is being safely controlled.

Internal erosion—often referred to as piping—can progressively remove soil particles from within the embankment or foundation. Early development may be difficult for a homeowner to recognize. Signs can be subtle, intermittent, hidden by vegetation, or located where an untrained observer would not appreciate their significance.

By the time muddy seepage, sinkholes, settlement, or other obvious symptoms appear, the problem may already be serious.

Gates and outlet works

Mechanical components present another example.

A gate may look perfectly normal but fail to operate when it is needed because of corrosion, mechanical deterioration, sediment or debris, electrical failure, problems with the lifting mechanism, or long periods without full operational testing.

The mere presence of a gate therefore does not demonstrate that the gate can be fully opened during an emergency.

Spillway capacity

Likewise, a spillway can look structurally sound yet have insufficient capacity for an extreme flood.

The July 2026 Liulan Reservoir failure in Guangxi, China, which I have studied separately, provides a recent reminder. During an extraordinary rainfall and flood event, reported operational difficulties included gates that could not all be fully opened as intended, followed by overtopping and breach development.

The scale, design, regulatory setting, and circumstances differ substantially from the small private dams addressed by New Jersey's disclosure law. Nevertheless, the broader engineering lesson is relevant:

Dam safety depends not only on what can be seen from the outside, but also on internal seepage behavior, hydraulic capacity, mechanical reliability, maintenance history, and performance under unusual conditions.

For homeowners and prospective buyers:

A walk around a dam is valuable for identifying visible warning signs, but visual appearance alone cannot establish its condition or safety and is not a substitute for an appropriate professional dam-safety assessment.

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7. Different Dam Inventories Serve Different Purposes

Discussions of how many dams exist in New Jersey can become confusing because different inventories were created for different purposes and use different inclusion criteria.

This distinction provides an important connection with my March 2026 brief. That earlier reflection discussed the broader universe of small, historic, low-head, and sometimes visually inconspicuous dams and barriers. The enacted disclosure law now allows that broader issue to be

separated more clearly from the narrower question of which structures are "dams" for purposes of property disclosure.

National Inventory of Dams

At the national level, the U.S. Army Corps of Engineers maintains the **National Inventory of Dams (NID)**, which currently contains information on more than 90,000 dams nationwide.

The NID is an essential national dam-safety resource, but it is not intended to contain every small artificial barrier in the country. Consequently, the number of New Jersey dams appearing in the NID has historically been substantially smaller than the number in New Jersey's own dam-safety records. My March 2026 brief, for example, noted approximately 830 New Jersey dams in the NID compared with approximately 1,700 in the State dam-safety system.

This difference should not be interpreted as a defect in either inventory. Their purposes and inclusion criteria differ.

New Jersey's dam-safety records

The most detailed recent public breakdown I have identified comes from the 2025 New Jersey State Auditor's audit of the Bureau of Dam Safety, using Bureau data as of April 2024.

At that time, the Bureau database contained **1,728 Class I–III dams**:

Classification	**Number**
Class I — High Hazard, Large	33
Class I — High Hazard, other	198
Total Class I	**231**
Class II — Significant Hazard	336
Class III — Low Hazard	1,161
Total Class I–III	**1,728**

The State Auditor also reported that **1,035 of the 1,728 dams—approximately 60%—were privately owned**. The Auditor found the dam data sufficiently reliable for purposes of its audit while also identifying issues concerning inspections, enforcement, and maintenance of dam records.

These numbers need to be interpreted carefully.

The **1,728 figure is specifically a Class I–III database count.** It should not automatically be interpreted as either:

1. a complete count of every physical dam or barrier in New Jersey; or

2. evidence that structures outside that Class I–III count are unknown to NJDEP or other governmental entities.

The latter distinction becomes particularly important for Class IV dams.

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8. Class IV Dams and the Question of Distributed Records

Class IV dams deserve particular attention when considering the relationship between New Jersey's dam-safety records and implementation of the new disclosure law.

As discussed in Section 3, the 5-ft water-level-rise criterion is not new to the disclosure law. It is part of the longstanding general definition of a dam under New Jersey's dam-safety framework and is now explicitly included in the enacted disclosure law.

Class IV is a separate classification under N.J.A.C. 7:20-1.8. The 5-ft water-level-rise criterion used in the general definition of a dam and the Class IV **less-than-15-ft height-of-dam criterion are different measurements serving different regulatory purposes**. They should not be interpreted as the lower and upper limits of a single 5-to-15-ft physical dam-height range.

Class IV dams also follow a different administrative pathway.

N.J.A.C. 7:20-1.3 provides a **permit-by-rule** for Class IV dams. Owners and operators are not required to file documents with or obtain a conventional dam permit from NJDEP, but the dams are not simply outside the dam-safety framework. Among other requirements:

- the dam must meet the applicable technical design requirements;
- a New Jersey licensed professional engineer must design the Class IV dam;
- necessary local approvals must be obtained; and
- if it is designed or constructed for stormwater-management purposes, it must also comply with the Stormwater Management Rules at N.J.A.C. 7:8.

The inspection system is likewise important. N.J.A.C. 7:20-1.11 requires **Class III and IV dams to receive regular inspections every four years**. Formal and regular inspections must be performed by a New Jersey licensed professional engineer. Unlike Class I–III inspection reports, however, regular Class IV reports are submitted to the **county and/or municipal engineer having jurisdiction over the dam structure**, rather than routinely to NJDEP.

This substantially changes how the Class IV inventory question should be interpreted.

I have not identified a current authoritative public statewide count of Class IV dams comparable to the State Auditor's published Class I–III count. But that does **not** mean Class IV dams are generally unknown.

Individual Class IV structures may be documented through NJDEP information, county or municipal engineering records, professional engineering records, stormwater approvals, local permits, historical files, or other sources.

The long history of New Jersey dam regulation also matters. State regulation dates to 1912; the Safe Dam Act was established in its modern form in 1981; and N.J.A.C. 7:20 followed in 1985. New dams designed and constructed under this framework would ordinarily generate professional engineering, local approval, inspection, stormwater-management, or other governmental records, even when the records are not all maintained in one public statewide Class IV table. This is a reasonable inference from the regulatory framework, not evidence that every qualifying structure is necessarily known.

Accordingly, I no longer think the principal implementation question should be framed as:

How many disclosure-law dams are missing?

A more useful question is:

How can existing State, county, municipal, engineering, and other records be made sufficiently accessible and coordinated so that a seller or purchaser can reliably determine whether a property contains a dam subject to disclosure?

The enacted legislation itself points in this direction by directing sellers and purchasers to the NJDEP Bureau of Dam Safety for assistance.

The practical implementation challenge therefore appears to be at least as much about **access to and coordination of information** as about finding physical structures that no one knows exist.

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9. Smaller and Low-Head Dams, and Historical Inventory Gaps

The narrower statutory definition used for the new disclosure law does not make smaller barriers unimportant.

This is where the broader discussion in my March 2026 brief remains particularly relevant.

Structures that fall below New Jersey's general 5-ft water-level-rise criterion, old mill dams, low-head dams, small pond embankments, and other artificial barriers may still matter for:

- stream connectivity and fish passage;
- sediment transport;
- aquatic habitat;
- river and wetland restoration;

- recreational and boating safety;
- local hydraulics and flooding behavior;
- historical and cultural resources;
- water quality; or
- landscape management.

These structures may therefore be tracked or studied under **different inventories for different purposes**.

For example, the U.S. Army Corps of Engineers maintains a national **Low-Head Dam Inventory (LHDI)**. Its definition includes river-wide artificial barriers with a drop of at least six inches and no more than 25 ft. More than 13,000 low-head dams were initially identified nationwide from information collected beginning in 2021. Following subsequent data review and refinement, the current LHDI contains information on approximately 10,000 low-head dams, and the dataset continues to be updated as additional information becomes available.

Other organizations maintain or use dam and barrier datasets for purposes different from regulatory dam safety. For example, The Nature Conservancy's New Jersey river-restoration work includes a statewide dam-removal prioritization map used to identify and prioritize barriers for ecological connectivity and river-restoration purposes. Such datasets may include structures that are relevant for environmental or recreational purposes even when they are outside the particular universe addressed by the State's dam-disclosure law.

Thus, several questions should not be conflated:

Is the structure in the National Inventory of Dams?
Does it meet New Jersey's dam-safety/disclosure definition?
Is it documented in State or local governmental records?
Is it a smaller or low-head barrier important for environmental, recreational, historical, or other purposes?

The answers can differ.

This also clarifies a point from my March brief. At that time, the proposed disclosure legislation did not itself define "dam," so the broader issue of hidden small barriers was particularly relevant. The enacted law now establishes a clearer boundary for disclosure. The broader search for smaller and low-head structures remains worthwhile, but it serves additional purposes beyond this particular property-disclosure law.

Historical inventory gaps

Inventories nevertheless can have gaps.

Following the severe July 2004 storms in southern New Jersey, numerous dams failed or were damaged. A subsequent State task-force investigation documented that **seven failed dams had**

not previously been recorded in the Department's database and therefore had no record of previous condition.

That historical experience is important, but it should be interpreted carefully.

It demonstrates that undocumented qualifying structures have existed. It does **not** establish the completeness or incompleteness of today's records, nor does it establish that a large population of dams subject to the 2026 disclosure law remains unidentified.

New Jersey's dam-safety program, geospatial information, local regulatory records, and technology have all evolved substantially during the two decades since the 2004 storms.

A balanced conclusion is therefore:

Inventory gaps can occur, particularly for old, small, abandoned, modified, or poorly documented structures. But absence from one published inventory should not automatically be interpreted as absence from all governmental knowledge or records.

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10. Could Modern Technology Supplement Existing Dam Information?

Yes.

Modern geospatial technologies provide opportunities that were not readily available when many dam inventories were originally assembled.

LiDAR and high-resolution digital elevation models can reveal linear embankments, flat dam crests, upstream/downstream elevation differences, spillway channels, former stream channels, and subtle terrain features hidden beneath vegetation.

Aerial and satellite imagery can reveal ponds and reservoirs, artificial shorelines, stream-spanning barriers, changes through time, and landscape features suggesting artificial impoundment.

GIS can combine these observations with stream networks, watershed boundaries, parcels, roads, existing inventories, and other spatial information.

Machine learning and artificial intelligence can help screen large areas and identify candidate dams or dam-like structures for further review.

A useful workflow might be:

Existing State/local records → inventory reconciliation → LiDAR/DEM and imagery screening where useful → stream and waterbody analysis → historical records and imagery → AI/ML candidate identification → prioritized engineering or field verification → improved records

AI should not make the final regulatory determination.

Remote sensing and AI can identify candidates, inconsistencies, or possible omissions; engineering judgment, agency records, appropriate measurements, and field verification should establish regulatory status.

Importantly, the role of these technologies should ***not*** be framed as:

New disclosure law → large unknown population of regulated dams → statewide dam hunt

The information reviewed for this reflection does not support that conclusion.

Instead, modern technology can be especially useful for:

- reconciling State and local records;
- checking locations and geometry;
- identifying abandoned or modified structures;
- identifying old dams for which records are incomplete;
- studying structures below the disclosure-law threshold;
- improving low-head-dam inventories;
- supporting stream-restoration planning; and
- prioritizing field investigation.

This could be an appropriate area for collaboration among NJDEP, other government agencies, universities, local governments, conservation organizations, and engineering professionals.

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11. How Much Can Dam Ownership Cost?

The *NJ.com* article understandably highlights the potentially substantial financial burden faced by individual homeowners. It reports that, in one case, removing or taking apart the dam was estimated to cost nearly $1 million, while repairing it could cost even more.

That is an important real-world example, but it should not be interpreted to mean that dam repair normally costs $1 million.

Costs vary enormously.

The following figures are illustrative planning ranges based on general engineering experience. They are **not derived from a statewide New Jersey cost database and are not NJDEP fee schedules, contractor quotations, or estimates for any particular property.**

Potential need	Illustrative order of magnitude
Existing records / straightforward disclosure	Little or no significant additional cost
Limited survey or measurements	Hundreds to several thousand dollars
Initial engineering consultation/site review	~$1,000–$5,000+
Formal engineering inspection/report	~$3,000–$15,000+
Detailed hydraulic/geotechnical/survey/stability studies	~$10,000–$50,000+, sometimes more
Routine maintenance	Hundreds to several thousand dollars
Significant localized repair	~$10,000–$100,000+
Major rehabilitation	~$100,000–$500,000+
Complex rehabilitation	~$500,000–$1 million or more

Dam removal can also be expensive because it may involve engineering, permitting, water diversion, demolition, sediment management, stream restoration, bank stabilization, revegetation, and monitoring.

A USGS analysis compiled reported costs for **668 U.S. dam removals**. After adjustment to 2020 dollars, costs varied enormously—from approximately **$1,000 to $268.8 million per dam**. The median reported removal cost was approximately:

- **$157,000 for dams less than 5 m high;**
- **$823,000 for dams between 5 and 10 m; and**
- **$6.2 million for dams higher than 10 m.**

Dam height, average discharge, and project complexity were among the principal cost drivers.

These national statistics should not be used as project-specific estimates for an individual New Jersey dam. They demonstrate instead the enormous variability in dam-removal costs.

The important point is:

The disclosure law does not create a deteriorated spillway, failing outlet, unstable embankment, or expensive rehabilitation problem. It reveals an infrastructure responsibility that already exists.

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12. Disclosure Does Not Solve the Funding Problem

The *NJ.com* article raises another important issue through comments from a dam owner: disclosure can protect future buyers, but it does not necessarily solve the financial problem faced by current owners of deteriorating private dams.

This distinction deserves attention.

Three related policy questions are:

Disclosure: Who needs to know about the dam?

Dam-safety regulation: What must be inspected, maintained, repaired, or otherwise addressed?

Funding: How can necessary work actually be paid for?

The new law primarily addresses the first.

The State Auditor reported that New Jersey has historically maintained bond-funded programs providing low-interest loans to dam owners for restoration and repair projects.

As the State implements the disclosure law, consideration of financing mechanisms, technical assistance, cost-sharing, loans, grants, or other programs may become increasingly important—particularly where a privately owned dam also protects downstream people, roads, utilities, or other public interests.

Not every privately owned dam warrants public financial support. But where the benefits or consequences extend substantially beyond the owner's property, it may be appropriate to consider whether some costs should also be shared more broadly.

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13. Liability and Insurance

Dam ownership can also create legal and financial exposure if failure results in injury or damage to neighboring or downstream property.

Dam failures in the United States have resulted in litigation. Whether an owner is ultimately legally liable depends upon the particular circumstances and applicable law; **being sued following a failure is not the same as being found liable**.

At the same time, I am not aware of a general New Jersey requirement that every private dam owner purchase dam-specific liability insurance simply because the property contains a dam.

These are different issues:

No general dam-specific insurance mandate does not mean no potential financial exposure.

Owners should understand what their homeowner, general-liability, association, or other insurance does and does not cover and obtain appropriate professional insurance or legal advice where necessary.

Insurance also does not substitute for proper inspection, maintenance, repair, and emergency preparedness.

Interestingly, following the 2004 failures, the State task force recommended examining whether insurance covering liability and property damage could be made available to dam owners.

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14. Extreme Weather Makes Dam Awareness More Important

The *NJ.com* article also reported my observation that more frequent large storms can place additional strain on dams that were not designed for such conditions and may increase inspection and maintenance needs.

The engineering relationship is broader than rainfall alone.

Extreme rainfall can increase watershed inflow and hydraulic loading on reservoirs, spillways, outlets, and embankments.

For earthen dams, extreme events can contribute to:

- overtopping;
- erosion;
- increased seepage;
- internal erosion;
- slope saturation and instability;
- spillway stress; and
- outlet problems.

Risk depends on the interaction of rainfall magnitude and duration, antecedent wetness, reservoir level, available storage, watershed response, spillway capacity, outlet reliability, dam condition, and downstream consequences.

Older dams warrant particular attention because the hydrologic assumptions used when they were designed or constructed may differ from present or future conditions.

Extreme rainfall makes knowing what you own even more important.

Climate and hydrologic changes are not themselves the reason for disclosure, but they can increase the value of awareness, inspection, preventive maintenance, and transparency.

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15. Dams Are Not Simply Liabilities

A discussion centered on failures, repair costs, and disclosure could easily leave the impression that dams are merely liabilities.

Historically, however, dams played an important role in American industrialization.

Before widespread steam power and electrification, small dams created hydraulic head for water wheels and turbines that powered gristmills, sawmills, textile mills, iron works, and numerous other early industries.

Communities and manufacturing centers frequently developed around water-powered sites.

Many small dams remaining today are therefore physical remnants of an earlier generation of American infrastructure and industrial development.

Depending upon the site, dams and their impoundments can continue to provide:

- water supply and storage;
- irrigation;
- hydropower;
- flood control and downstream flood-risk reduction;
- recreation and fishing;
- scenic and landscape value;
- historical and cultural value;
- habitat associated with the impoundment; and
- other community benefits.

Where adequate flood-storage capacity is available and releases can be appropriately managed, a dam can temporarily store floodwater, attenuate peak discharge, and reduce downstream flood impacts.

Water bodies may also provide some localized microclimate moderation and evaporative cooling, although the magnitude depends greatly on waterbody size, meteorology, vegetation, and surrounding land use, and evaporation also represents water loss.

There are also aesthetic values that conventional engineering benefit-cost calculations do not easily capture. Artificial waterfalls created by historic dams can provide attractive views, movement, and the sound of falling water.

As an engineer, I personally appreciate many of these features. That personal appreciation, however, should remain separate from the engineering decision concerning the future of a particular dam.

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16. Maintain, Rehabilitate, Modify—or Remove?

Not every old dam should be preserved, but neither should removal automatically be regarded as the preferred solution.

Dams spanning significant streams can affect both upstream and downstream conditions, including:

- fish migration;
- sediment transport;
- stream connectivity;
- water temperature and quality;
- aquatic habitat;
- upstream and downstream water levels; and
- recreational safety.

Their relationship with flooding is more complex. Dams with available flood-storage capacity and adequate release facilities can reduce downstream flood peaks and associated flood damages. At the same time, overtopping, dam failure, or unusually large or rapid releases can create serious downstream flood hazards. Reservoir operations can therefore influence both the reduction and redistribution of flood risk.

At some sites, removing an obsolete dam can provide substantial ecological and safety benefits.

At others, rehabilitation, modification, fish ladders or fishways, bypass channels, or other measures may allow important dam benefits to remain while reducing particular environmental impacts.

Fish passage, however, should not be treated as universally equivalent to removal. A fishway may improve migration for particular species without restoring natural sediment transport, thermal conditions, channel processes, or complete ecological connectivity.

The decision is therefore broader than “preserve or remove.”

Maintain → rehabilitate → modify → improve fish passage → partially remove → fully remove

The appropriate choice depends on safety, environmental effects, historical significance, economics, water-management functions, recreation, aesthetics, and community priorities.

17. From Disclosure to Better Dam Stewardship

The *NJ.com* article began with a problem encountered by individual homeowners: people can acquire not only a house and land but also a piece of aging infrastructure carrying responsibilities they may not fully understand.

New Jersey's new law is an important response.

But effective implementation can accomplish more than improving a real-estate transaction.

For **prospective buyers**, disclosure provides transparency.

For **current owners**, it can increase awareness of inspection, maintenance, repair, liability, and long-term responsibilities.

For **NJDEP and local governments**, implementation provides an opportunity to make existing dam information easier to locate, understand, and use and, where appropriate, improve coordination among records maintained at different governmental levels.

For **engineers and researchers**, modern geospatial and AI technologies provide new opportunities to reconcile inventories, identify candidate structures where additional investigation is warranted, and better understand smaller and historic barriers.

For **environmental and conservation organizations**, low-head and other small barriers remain important for stream connectivity, river restoration, habitat, and recreational safety, even where those structures fall outside the particular definition used by the disclosure law.

And for **policymakers**, the homeowner experiences highlighted by *NJ.com* raise a further question about how necessary safety improvements to privately owned dams should be financed when benefits or risks extend beyond the owner's property.

A dam can simultaneously be:

infrastructure + a source of risk + an environmental intervention + a historical artifact + a recreational or aesthetic resource

The same dam may reduce downstream flood risk when functioning as intended while also creating a potentially serious downstream hazard if it fails.

Those characteristics vary enormously from one dam to another.

The appropriate approach is therefore neither to regard every old dam as a dangerous "money pit" nor to assume that every historic dam should remain indefinitely.

The new disclosure law also should **not** be interpreted as requiring New Jersey to rediscover its regulated dams from scratch. The State has had a dam-safety regulatory system for more than a century. Classes I–III are centrally documented by NJDEP, while Class IV dams follow a different permit-by-rule and local-reporting pathway. A broader universe of small and low-head barriers exists, but many of those structures are relevant to other regulatory, environmental, restoration, historical, or public-safety purposes rather than to the new disclosure requirement.

The more immediate opportunity is to make existing information work better:

Disclosure provides transparency. Better access to information supports better inspection and maintenance. Earlier maintenance can reduce risks and potentially avoid much more expensive repairs. Coordinated records can make the disclosure system itself more reliable. Modern technologies can supplement those records and help identify genuinely overlooked structures where necessary. Together, these steps can move New Jersey from dam disclosure toward better long-term dam stewardship.

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Notes on Interpretation

Dam inventories: Different inventories have different purposes and inclusion criteria. The State Auditor's 1,728 figure represents the April 2024 Class I–III database snapshot. It should not be interpreted as the total number of physical dams or barriers in New Jersey. Conversely, the absence of a current publicly identified statewide Class IV count should not be interpreted as evidence that Class IV dams are generally unknown to NJDEP or other governmental entities.

Class IV records: N.J.A.C. 7:20 establishes a different regulatory and reporting pathway for Class IV dams, including permit-by-rule provisions and regular inspection reports submitted to county and/or municipal engineers. The distribution and completeness of current Class IV records across NJDEP and local governments have not been independently established in this reflection.

Smaller barriers: Structures below the dam definition applicable to the disclosure law may still have engineering, environmental, historical, restoration, or recreational-safety significance. Their existence should not be interpreted either as a deficiency in the scope of the disclosure law or as evidence of missing regulated dams.

Inventory completeness: Historical evidence demonstrates that gaps have occurred, including the seven failed dams not previously recorded in the NJDEP database following the 2004 storms. That fact should not be extrapolated into an estimate of the current number or percentage of qualifying dams that may be absent from governmental records.

Cost estimates: Except for published statistics specifically attributed to USGS or other sources, the cost ranges presented above are illustrative order-of-magnitude planning ranges based on general engineering experience. They are not NJDEP fee schedules, contractor quotations, or estimates for a particular property.

Professional assessment: The appropriate scope and professional requirements for inspecting or evaluating a particular dam depend on its classification, regulatory status, condition, and purpose. A homeowner's visual observations can be useful but should not be treated as equivalent to a professional dam-safety inspection when one is required or warranted.