

Twenty-two percent of North Carolina's 5,250 dams are classified as high hazard. A high hazard dam failure would cause loss of life, significant damage to homes and businesses, and have other major economic impacts on the communities downstream. The estimated cost to rehabilitate the most critical deficient structures in North Carolina is approximately \$400 million. **As a result, the State's dam infrastructure has been given a grade of D.**

BACKGROUND

Dams provide water storage, cooling water for nuclear power plants, flood reduction, hydroelectric power, waste water storage and treatment, as well as recreation for the citizens of North Carolina.

All high hazard dams in North Carolina are inspected every 2 years and all low hazard dams are inspected every 5 years. Inspectors are also required to attend inspection training to assure conditions are properly noted and recorded. If problems are discovered during the inspection, a Notice of Deficiency (NOD) is sent to the owners. There are currently more than 140 NOD's outstanding in North Carolina. The number of dams in North Carolina, by hazard classification, are as follows:

Hazard Classification	Number of Dams
High	1,148
Intermediate	764
Low	3,338

The State of North Carolina only owns 29 of the more than 5,200 dams. Approximately 10 percent of the dams—525—are “exempt”, which means that other entities are responsible for their inspection and maintenance. Almost 450 “exempt” dams are privately owned, and many others are owned by groups like the Tennessee Valley Authority (8 dams), the United States Army Corps of Engineers (16 dams), the North Carolina Utility Commission (6 dams), the National Park Service (4 dams) and the Federal Energy Regulatory Commission (44 dams).

The breakdown of North Carolina dam ownership is as follows:

Type of Owner	Number of Dams
Federal Government	13
State of North Carolina	29
Local Governments	60
Utilities	49
Private owners	3,128
Unknown owners	1,973

CONDITIONS

Like all man-made structures, dams deteriorate. Deferred maintenance accelerates deterioration and causes dams to be more susceptible to failure. As with other critical infrastructure, significant investment is essential for maintaining benefits and ensuring safety. The design life of a dam is 50 years. The age of North Carolina's dams is as follows:

Year Constructed	Number of Dams
Before 1901	65
1901 to 1920	105
1921 to 1940	157
1941 to 1960	579
1961 to 1980	610
After 1981	584
Unknown	3,150

There are only 15 full-time inspectors covering all the dams in the state of North Carolina. Each year an inspector must review 69 high hazard dams and 46 intermediate hazard dams. In 2005, 1,485 dams were inspected in North Carolina, 694 high hazard, 261 intermediate hazard and 530 low hazard; and there were a total of 143 NOD cases noted, 93 high hazard, 28 intermediate hazard and 22 low hazard.

Only 195 of the 1,150 high hazard dams in North Carolina have an Emergency Action Plan (EAP) on record, and not one of them meets the Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners (FEMA 64 October 1998, reprinted April 2004, pages 5-8). Also, no

funding is currently available at the state level for repair or removal of existing dams.

The annual budget for North Carolina's entire dam safety program is just under \$1.2 million.

Grades were assigned to the dams category in three areas. A grade of F was given to funding, due to the lack of a consistent source funding. A grade of F was given to EAPs because the few existing plans do not meet current federal guidelines. And finally, a grade of B was given to condition because only 93 of the 694 high hazard dams inspected in 2005 received a NOD letter. Those three areas combined for an overall grade of D for North Carolina's dams.

POLICY OPTIONS

The alarming lack of public support and understanding of the need for proper maintenance and repair of dams is dangerous and unacceptable. No one pays attention to a dam until it fails—although dam infrastructure is an issue that affects the safety of millions of people who live and work in the path a

sudden, catastrophic and deadly dam failure might take. ASCE supports the Dam Safety Coalition and its proposal to create a federal funding program to repair the nation's unsafe dams. ASCE also supports the Dam Repair and Rehabilitation Act, which failed to pass in Congress in 2005 (H.R. 1105/S. 2444).

RECOMMENDATIONS

- Increase staff and budget levels for the Dam Safety Office to accommodate for current and future inspection needs and permitting reviews;
- Create a national loan fund for repair, rehabilitation and removal of dams;
- Require full funding for the Small Watershed Rehabilitation Act;
- Develop a comprehensive information resource system to support the maintenance and improvement of dam safety;
- Develop EAPs for all high hazard dams in the State by 2010;
- Reauthorize the National Dam Safety Program Act in 2006 (S. 2735/H.R. 4981);
- Create a state funding program to assist dam owners with loans and matching grants; and
- Create a condition assessment inspection form for each high hazard dam with numeric ratings for the key aspects of each structure.

SOURCES

North Carolina Division of Land Resources, Dam Safety Office

National Dam Safety Review Board – State Dam Safety Evaluation Report for January 1, 2005 – December 31, 2005

ASCE, National Infrastructure Report Card 2005

2006 National Inventory of Dams (NID) Update Data Collection Results (2005)
