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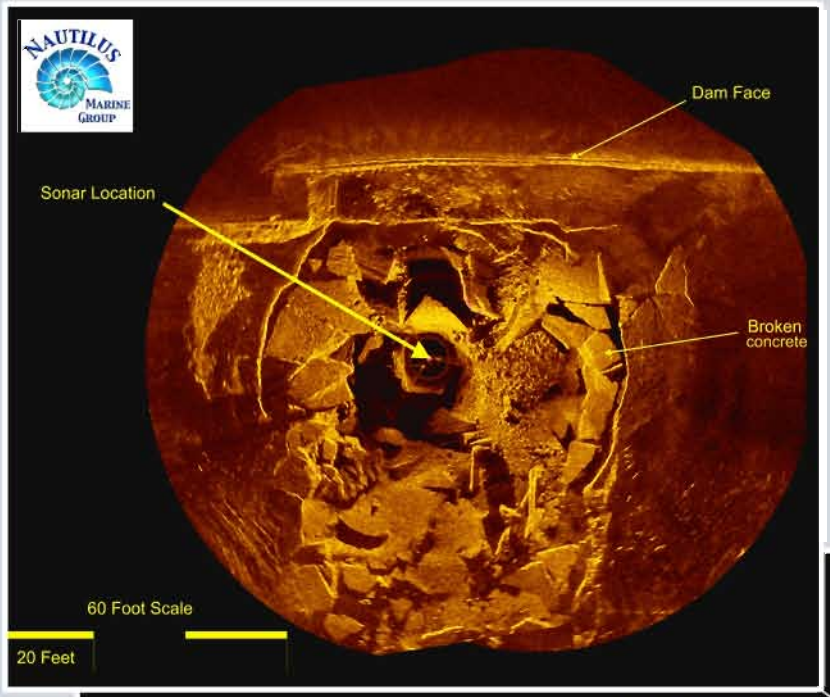
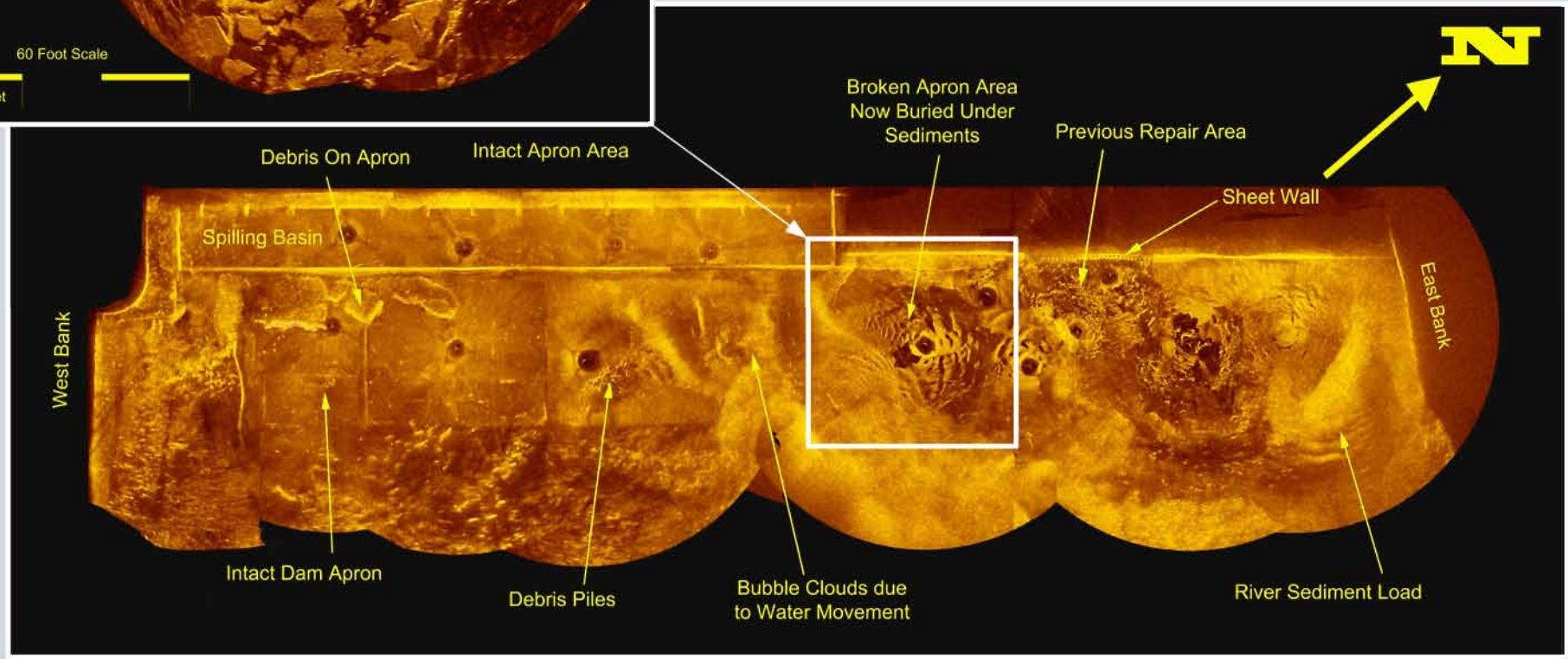
Aging Infrastructure of America's Dams



The average age of America's ***80,000*** dams is 54 years and, according to statistics published by the Association of State Dam Safety Officials, more than 2,000 dams near population centers are in need of repair. In 2008, 140 dams were fixed, but inspectors discovered 368 more that required major work to bring them to current safety standards. That's why the American Society of Civil Engineers gave US dams a grade of "D" in its 2009 report on the nation's infrastructure.

The data on this page shows the results of two scanning sonar surveys of a mid-western US dam. The first survey revealed structural failure of the dam apron concrete due to hydraulic river flow. Concerned about causing further damage, the dam authority diverted the water away from where the concrete failure occurred. The time cycle between surveys was 6 months. The lower image from the second survey shows sediment aggregation in the damaged area.



Data courtesy ***Nautilus Marine Group, LLC.***, Lansing, MI

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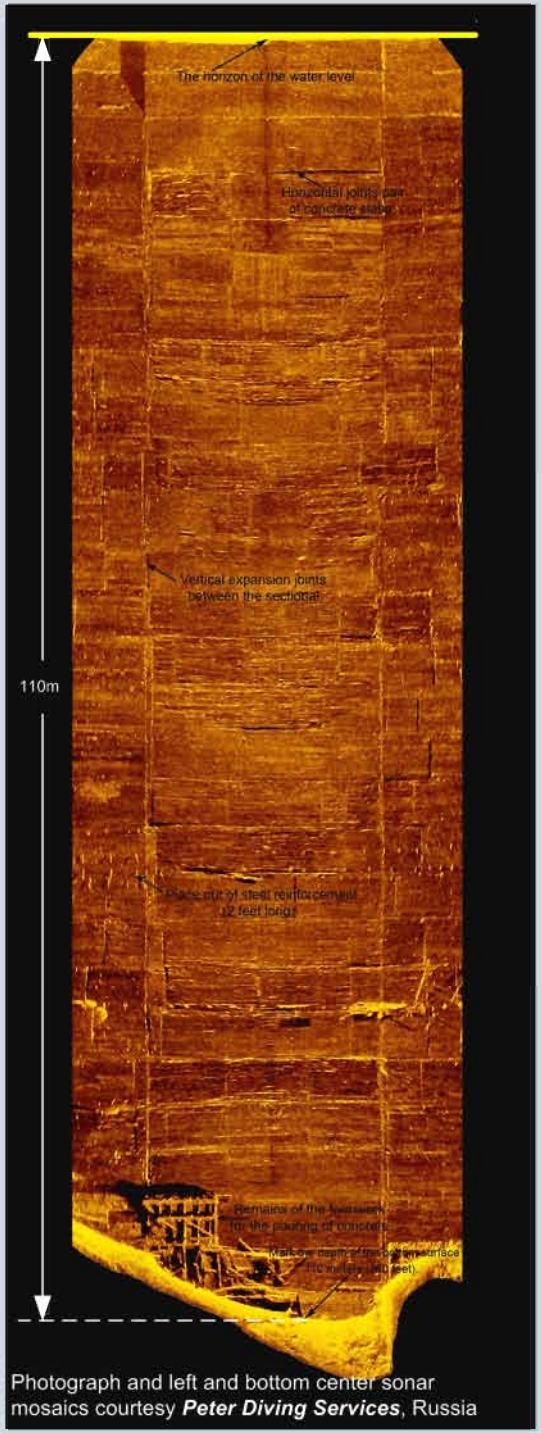
Imaging sonar for dam assessment surveys:

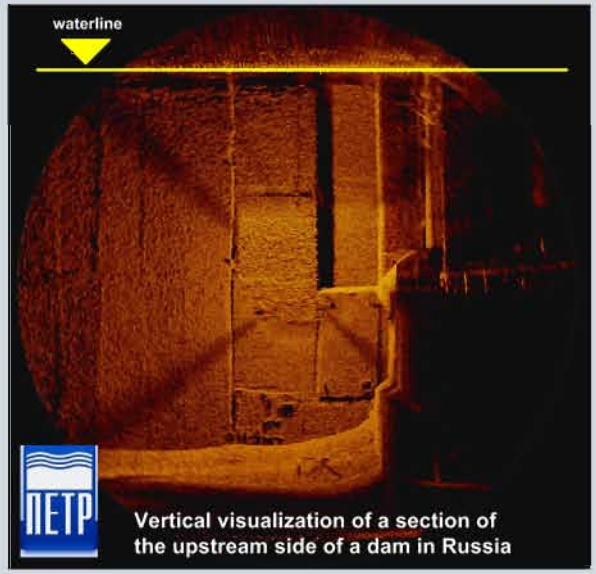
Aging infrastructure of dams is not unique to the United States. These records show the condition of dams in Russia and Canada.

The photograph of the custom-built frame shows how the Kongsberg Mesotech Ltd., High Resolution sonar head was ROV-deployed to collect the left and center images. By pushing the frame against the vertical face of the dam, the ROV pilot kept the sonar head standoff distance identical for all scans.

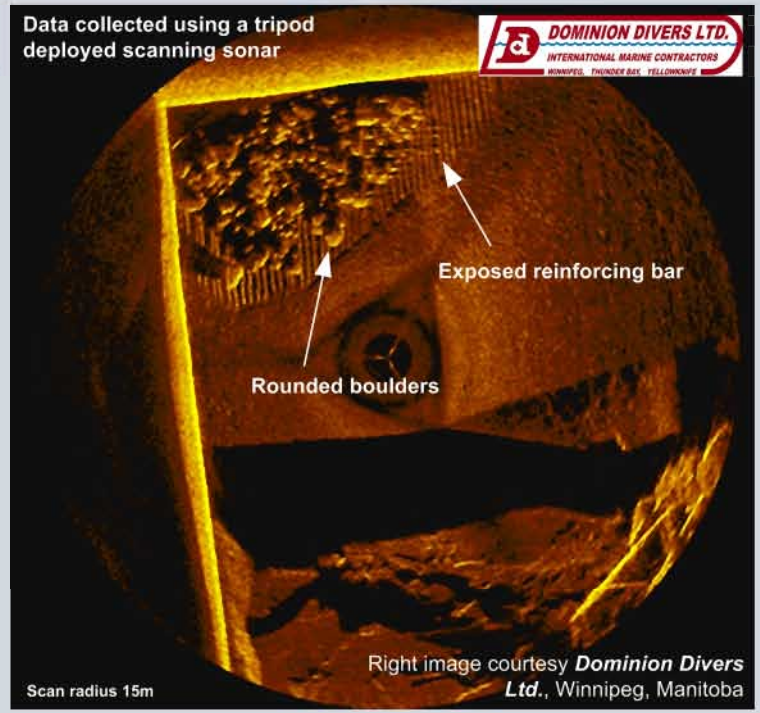
The MS 1000 and 675kHz High Resolution Sonar Head were used to collect all the data.



Photograph and left and bottom center sonar mosaics courtesy ***Peter Diving Services***, Russia



Vertical visualization of a section of the upstream side of a dam in Russia



Right image courtesy ***Dominion Divers Ltd.***, Winnipeg, Manitoba

The right sonar scan shows a corner section of the downstream dam apron and a condition known as “Ball Milling.” This is the result of rock boulders being hydraulically trapped due to the structure’s shape and where the current rolls them against the concrete. The rocks become rounded (ball-like), and in this case, they have worn the concrete surface to where 5.08cm (2") reinforcing bar is exposed.

THE FULL PICTURE