

# Fisher Insight

## HISTORIC AQUARIUM USES LASER SCANNING TO SUPPORT RENOVATION

The Aquarium of Niagara is in active preservation and update mode, adding multiple exhibits in the past few years and planning newer and bigger exhibits to delight future generations. To support this phenomenal growth, it was necessary to assess and restore existing infrastructure and ensure that planned future exhibits are developed soundly and safely. The challenge was how to assess underwater facilities with the least amount of disruption to the exhibits. Laser scanning was the right technology to safely and accurately provide the detailed data needed for assessment, design, and construction.



### What Lies Beneath

The nearly 60-year-old, non-profit Aquarium of Niagara touts several firsts in its history. Founded by a small group of chemists and scientists, the team developed the first artificial seawater formula designed for inland aquariums. The synthetic formula, Instant Ocean, is now used by inland aquariums worldwide. Further, the aquarium is renowned as one of the few facilities across North America to establish a thriving Humboldt penguin colony, a critically threatened species. More recently, the aquarium is also known for its aquatic conservation efforts and its recognition as the premier facility for blind seals.

Given the historic nature of the aquarium and its importance as an incubator for economic growth in the Niagara Falls region, the aquarium relied on the expertise of their long-term contractor and original construction team, Scrufari Construction, to continue with renovations and upgrades to the facility and evaluate conditions for future development. As Scrufari began evaluating the existing conditions around the main arena tank holding thousands of gallons of water and the underground secondary tank where animals are temporarily relocated during routine cleaning, the extent of the damage attributed to saltwater became apparent. Increasingly unforgiving and damaging, particularly to concrete, saltwater had caused extensive spalling and pipe damage to the underground ceiling of the tank.

Scrufari had partnered with Fisher Associates on multiple high-profile projects in the past and this invested relationship supported a streamlined process, as well as a collaborative and innovative approach to undertaking new challenges. Scrufari knew who to call when they determined they needed a clear visual representation of the conditions present to assess the extent of the deterioration to the aquarium facility and the needed repairs. Another key challenge was to undertake the project without removing current exhibits which would cause severe disruption.

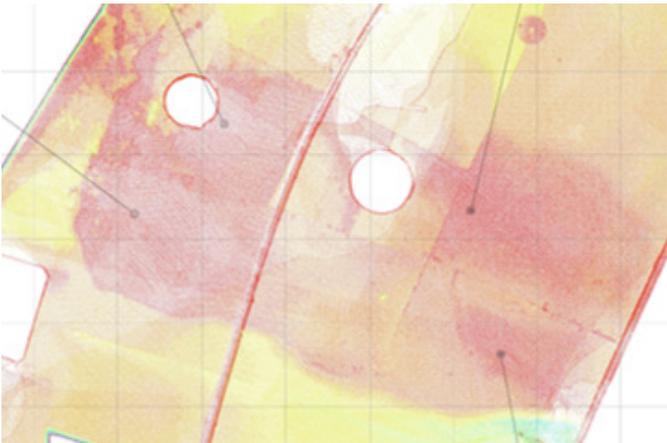
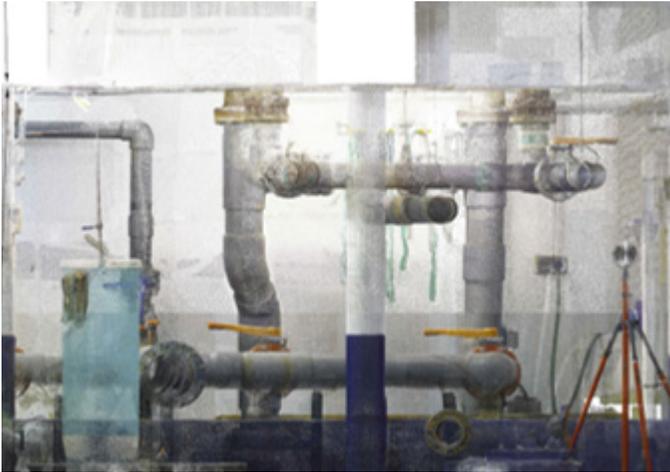


*Identifying variations in the subterranean ceiling would have taken an immense amount of time to obtain the optimum quality of data if attempted manually.*

### Skimming the Surface

When living creatures are involved, an otherwise standard laser scanning job immediately becomes not so standard. For this non-traditional mapping project Fisher had to think unconventionally — unlike traditional manual concrete evaluation, scanning the ceiling conditions involves looking up with the relief coming at you, and this prompted our geomatics experts to suggest

a digital/laser scan of the filter tank ceiling area. The scan would ultimately produce a color topographic image with multiple views and detailed drawings of the face of the compromised concrete, identifying specific deterioration, depth of spalling, and loss of material in the concrete structure.



*Digital/laser scans of the filter tank ceiling area identified areas of deterioration in the ceiling.*

"It was necessary for the Aquarium of Niagara to get the clearest picture of conditions and solutions and weigh that against modern animal care standards and technology while planning for future needs." said Steve Boddecker, LS, of Fisher Associates. A further goal of the project entailed formatting the resulting thousands of points of data into an easily understandable report and producing a 3D fly-through of the project for the client to gain the clearest picture of existing conditions so they could make the most informed decisions about a path forward.

**THE MYRIAD OF DATA POINTS GATHERED FROM THE LASER SCAN IMPARTS MULTIPLE VIEWS OF THE CONDITIONS PRESENT — THE TEAM COMPILED AND PRESENTED THE DETAILED INFORMATION IN A DIGESTIBLE FORMAT TO THE AQUARIUM BOARD.**

To continue serving the community and garner ongoing support for this regional amenity, the non-profit organization had to balance upgrading to modern standards with a tight budget, reinforcing the critical importance of streamlining the conditions assessment. "The amount of technology behind the scenes is just as important as what the visiting public sees every day." said Aaron Tandy with Scrufari.

### The Fisher Difference

Utilizing the most current scanning technology coupled with the expertise of a team knowledgeable in interpreting and presenting the resulting data were key to the success of this project. Fisher Associates was able to meet the tight budget of this important non-profit client allowing for continual safe operations of a facility dependent upon the revenue of visitors. For a client who counts on every dollar while maintaining the utmost in integrity and quality of care for their precious residents, this was the ultimate outcome to guarantee their ongoing presence as a fixture in the Niagara Falls community.

**CLICK OR SCAN THE CODE BELOW FOR A VIDEO OF THE NIAGARA AQUARIUM LASER SCAN PROJECT:**



🗨️ Contact Fisher Associate's Vice President and Director of Geomatics, Steve Boddecker, L.S. (sboddecker@fisherassoc.com) to discuss incorporating Fisher's digital/laser scan capabilities into your next project.