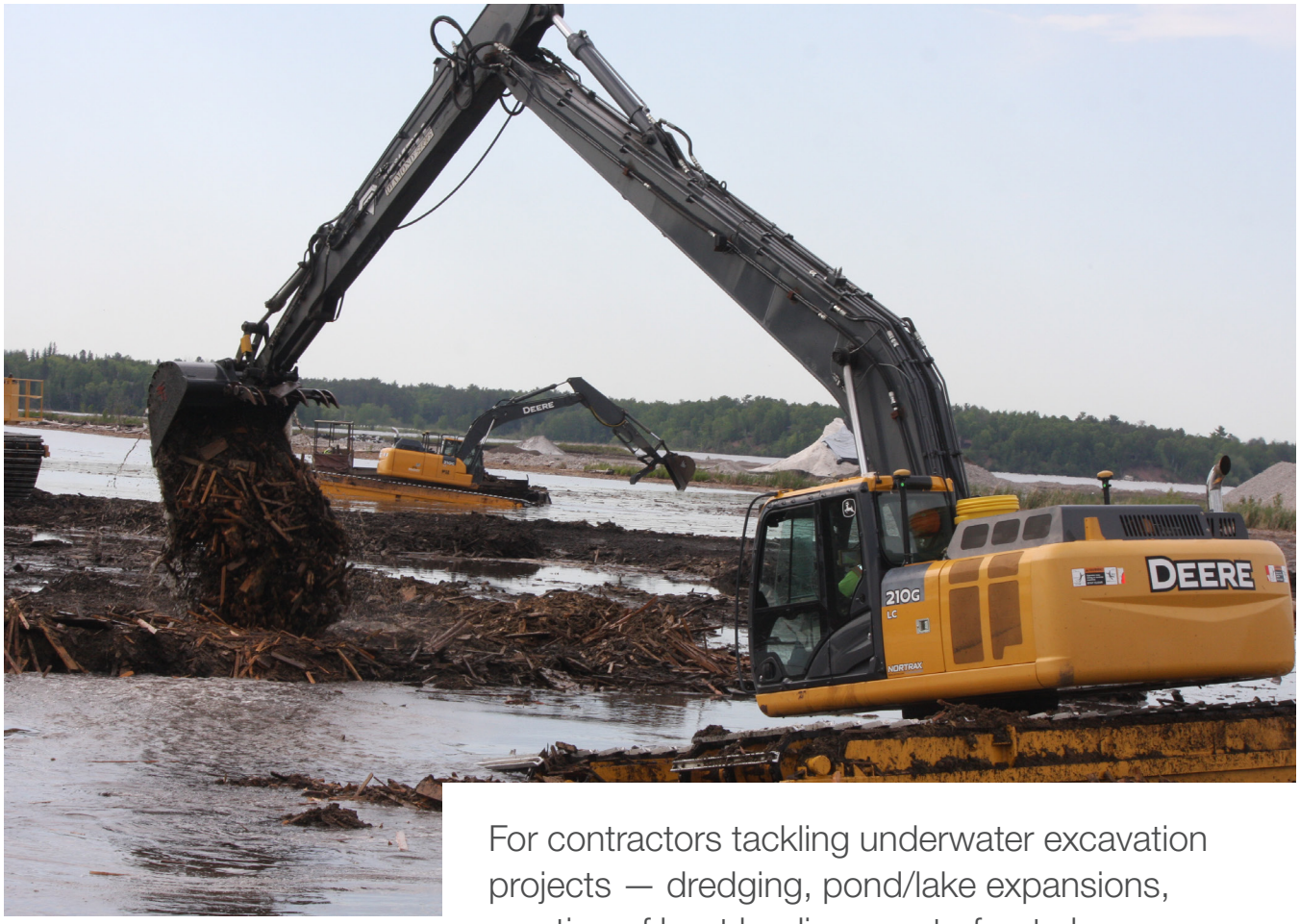
Six Feet/Under

GNSS solution guides amphibious excavators in northern Minnesota bay cleanup.



Company
Midwest Amphibious Equipment
Grand Rapids, Minnesota

Project
Underwater Waterfront Remediation
Duluth, Minnesota

Topcon Products
HiPer VR GNSS receiver, FC-5000 field computer, X-53i machine control system, Sitelink3D site management system

Topcon Dealer
McCoy Construction and Forestry, and RDO Integrated Controls

For contractors tackling underwater excavation projects — dredging, pond/lake expansions, creation of boat landings, waterfront cleanups, etc. — using GNSS solutions to "see" beneath the surface with their machines has proven invaluable for improving efficiency and minimizing the risk of over/under cutting. One such contractor, Midwest Amphibious Equipment (MAE), recently made the move to GPS on two of its specialty excavators for a huge restoration project on the waterfront in Duluth, Minnesota and has reaped the same benefits.

MAE's proven expertise for getting into places other contractors can't helped them land a Minnesota Department of Natural Resources-led (DNR) effort to remediate a section of the St. Louis River known as Grassy Point on Duluth's

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waterfront. Working as a subcontractor to Veit USA, MAE was tasked with removing more than 200,000 cubic yards of wood waste — remnants of late 1800-era sawmills — which had sat at the bottom of the river for more than a century.

MAE's past projects have included both wetland mitigation and swamp work in which the machine operator could see where they were digging, as well as jobs in which maintaining accurate river or lake bottom elevations was not that critical. Neither of those applied at Grassy Point, said company CEO Steve Gilbertson.

"Here, inches really matter, both from a compliancy and a materials standpoint," he said. "We don't get paid for any material we over dig, but it could cost us dearly if we were to under dig. Given that we can see less than a foot into the murky water, it quickly became obvious we needed a more precise method of measuring our cuts as we removed debris."

Based on his past construction experience, Gilbertson suspected that the answer to his "digging blind" dilemma could be found in a GPS solution, so he contacted McCoy Construction and Forestry, the local John Deere dealer, to explore his options. According to Lucas Weir, McCoy's IGS specialist, the call forever changed the way Gilbertson and his team would work.

"I went out and met with Steve and, after hearing his concerns, suggested a Topcon HiPer VR with an FC-5000 field controller, as well as an X-53i system on their excavator. Working with our partner dealer, the Bloomington, Minnesota branch of RDO Integrated Controls, we got it all for him in short order."

Gilbertson became an immediate proponent of the technology. "I can't imagine where GPS could be more helpful than underwater," he said. "On a land-based operation, you can look at an area and immediately see high and low spots," he said. "But once the water removes that visual element, it's a whole new ballgame. In addition, the Topcon system is also set up to measure as-builts as the operator digs. It seemed the ideal solution for us."

MAE's fee for the Grassy Point project is based on a unit price for the material recovered. Undercutting by six inches over the course of the six-acre job translates to 4,500 yards — or roughly $100,000 — for which they would not be compensated.

"Conversely, if we dig six inches too deep, we will not be paid for removing that additional material," said Gilbertson. "So, there's the potential for losing a couple hundred thousand dollars by not accurately knowing the surface we are dealing with. But the Topcon solution lets my guys know exactly where the bucket is in relation to the plan. It is dead-on every time, with tolerances to 1/10 of a foot — far closer than we need it to be."

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The nature of MAE's work — primarily in remote, swampy locations — means access to their machines can sometimes be near impossible. Enter Sitelink3D, a point-to-point communications solution.

"At a mitigation site, there might be several miles between machines — just getting to two machines in a day to see what they are doing is a real chore," said Gilbertson. "Using Sitelink, with the click of a button, I can do everything from verifying a machine's position to sending the as-built back to the office to looking at an operator's screen. It's proving a great addition to our operation.

"What's even more impressive, however, is that our contract at Grassy Point grew almost 1.5 times larger than when we started, and a good deal of the credit for that has to go to the Topcon solutions, which allowed us to be so much more productive and land the additional work."

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Visit the **Topcon YouTube channel** watch videos on the excavation technology featured in this TAW.