# Making NY's Lake George the World's 'Smartest'

MICHAEL HILL, Associated Press

Bolton Landing, NY (AP) — An unprecedented project to turn New York's Lake George into the "smartest lake in the world" is being launched and will monitor the lake from its sun-dappled shores to its dark depths in hopes of keeping the Adirondack attraction pristine.

Sensors analyzing the likes of stream runoff, rainfall, wind, currents, salinity, chlorophyll and nitrogen will be placed around Lake George this year and an IBM supercomputer will crunch the data to provide three-dimensional pictures of the lake. It's a model that scientists think could be used elsewhere, using a uniquely sophisticated monitoring system to help scientists predict the peril posed by threats like road salt and invasive species.

"We can turn the lake back from the edge of the abyss," said Fund for Lake George executive director Eric Siy. "We do not have a complete picture of Lake George scientifically, and we need it."

The advocacy group is joining IBM and Rensselaer Polytechnic Institute on Thursday to announce the comprehensive three-year project. Lake conditions will be monitored by a series of devices — some visible from land — including stream gauges, self-propelled underwater robots, weather stations, Doppler units and sensors running along lines anchored from buoys. The information will be fed into

an IBM Blue Gene supercomputer along with data collected over the past 30 years about the chemical composition of the lake.

The same sort of research is being done around the Great Lakes, but not in such a concentrated fashion. Research on the massive lakes is moving in that direction, said Guy Meadows, director of Michigan Tech's Great Lakes Research Center.

"The size that they're attacking is what is barely affordable at this time. And to make the next step to doing that in one of the five large Great Lakes would be a wonderful new addition," Meadows said.

Cradled by forested mountains in the southeast corner of the Adirondack Park, Lake George is famous for its clear waters. But it faces threats related to development, road salt runoff and invasive species like zebra mussels and Eurasian milfoil. Since the lake is not too large and relatively isolated by the surrounding mountains, it lends itself to intensive study, scientists said.

"Because in some ways Lake George is small — it's 32 miles long — we have the ability to do a very complete and thorough instrumentation," said Sandra Nierzwicki-Bauer, director of RPI's Darrin Fresh Water Institute.

The types of high-tech sensors that will be installed here this year are being used at other water bodies, but researchers at IBM and RPI say they're not being used together in such a comprehensive way. IBM engineer Harry Kolar called it an "additional level of heavy computational modeling." The supercomputer will provide three-dimensional models of the past, present and future of the lake. Computers also will provide real-time three-dimensional images to researchers and the public.

Nierzwicki-Bauer said getting a clear picture of the lake's circulation will provide a foundation for studying other issues from dead zones in the lake to rising chlorophyll levels. The data also will help in studying invasive species. For instance, the concentration of calcium in Lake George is on the border for what zebra mussels need to thrive. With this data, researchers would be able to more accurately predict when there would be a significantly greater risk for infestation, she said.

The water is still clean enough to drink, but Siy fears the lake is closing in on a tipping point if trends leading to deteriorating water quality aren't reversed.

Those involved say it's too early to determine a price tag. Kolar said work could continue on Lake George beyond the three years, and he expects the work in the Adirondacks to be a model for future projects.

"We certainly see this as being world-class technology and approaches that can be used in other ways," he said.

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