

Central Services

New software makes data collection and analysis easier and faster for the Water Survey of Canada. BY MIRA SHENKER

POLICIES THAT PROTECT OUR WATER are borne, in part, of good water monitoring. The process generally involves visiting a monitoring site once or twice a year, collecting the data from the sensors, and returning to the lab to analyze it, generate a report, and use the results to inform policy decisions.

It's hard to argue that good policy requires in-depth analysis, and analysis requires correct and clearly organized data. But in a vast, water-rich country like Canada, the sheer amount of available data is dizzying. The Water Survey of Canada (WSC), a division of Environment Canada, has a national monitoring network of over 2,400 stations.

Constrained by limited human capital and resources, the WSC has also suffered from inefficient data structures.

"The WSC had an older system. Everyone had their own database," says AJ Leitch, a sales and product engineer at Vancouver-based Aquatic Informatics Inc. A decade ago, she says, the WSC's focus was publishing data annually. "Technologists spent a lot of time just getting the data into a state where it could be processed."

Working with Environment Canada and the WSC, Aquatic Informatics has developed a system that allows workers to spend less time collecting and synthesizing data, simplifying data management for national water resource management agencies, hydrologists, and water resource engineers. New software consolidates water data from multiple sources, performs data quality control, develops rating curves, and reports to stakeholders in real time.

Monitoring in real-time

Leitch says, "Annual data doesn't help Saskatchewan or Winnipeg when

there's a flood event happening—we need to provide data to our customers instantaneously."

"With this software, we were able to centralize a database that would link to their main system," says Leitch. "We can provide calculations that they need, such as the amount of water in a river at any given time, in real time. We can set up ongoing monitoring to let them know when this level is at a certain point or if it needs attention."

In the electricity sector, real-time monitoring is the key to making smart meters work. Utilities and systems operators have been looking for a technology that would help manage the ever-increasing amount of data being produced by sensors, including smart meters, and the water industry seems to have found one.

Leitch explains why the breakthrough doesn't easily transfer to the power sector: "There's a whole network in place, but it has been put in place over decades. Because these sensors were in such remote locations, they were figuring out radio links long before any of this smart grid stuff was happening. [The options were to] visit a device twice a year and download data onto laptop, or putting up a radio tower and having the data sent. Whereas with the electrical system, [making this work] means having to replumb an existing infrastructure."

"With the power sector, there's also a billing aspect," says Leitch. "It's a slightly different industry in terms of what motivates it. The WSC is trying to provide environmental information for people to make decision on where

to locate power plant or what to do if there's a flood coming."

Making better decisions

This data is also being used to develop policies that protect rivers and other bodies of water from the impact of industry. If water level is affected and regulations aren't followed, that affects the fish and the ecosystem. Timely data would allow the government to connect changes in water quality to industry impact. Now that the sensors are able to send back data in 15-minute increments, it's making a significant difference from

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previous years, when the average was more like six months between data sets. With this new system, technologists are able to process and analyze the data more quickly, which changes the way the current system works and how the data informs policy decisions and better balance the demands on water resources from drinking water security, hydropower, irrigation, recreation, and nature conservation.

"Implementing a system with the federal government is a pretty phenomenal experience," says Leitch. "It's allowing them to make better decisions and it's affecting their policy."

The solution also limits the need for on-site monitoring personnel, part of

the larger consideration. But will this solution create efficiencies that will limit the need for more person-hours? Leitch doesn't believe that's the case. "It's freeing up technologists to do more detailed analysis of the data they've got and also to do it on relevant sites where there have been events," she says. "I don't have a sense of person or work replacement—it's just spending those hours on a different aspect of what needs to be modelled or investigated."

"The system allows WSC technologists to be capable of providing more analysis than they have in the past, allowing them to spend more time on what they were trained to do versus worrying about the sheer numbers of data and worrying about whether they can trust the numbers," she adds.

After a thorough testing period, WSC's Thunder Bay, Ontario office became the first of 28 offices to switch its complete real-time operations to the system. Since then, three have moved their existing

data to the system. The Regina Water Survey office will be the next in line to roll out the system, where its real-time data analysis solutions will be put to through the rigors during the next flood season. By December 5, 2011, all offices should be online.

Getting 24 different regional offices on one database, each of them used to working in a different way, has been a challenge to say the least. "We're changing the way they work, and who are we to change what they've been doing for years and years?" says Leitch. It hasn't been easy, but once the project is complete, it will, as Leitch says, "change the way the [federal government] works." wc



Mira Shenker is the associate editor of Water Canada. She is also ReNew Canada's editor.

PUBLIC ACCESS to real-time hydrometric (water level and streamflow) data collected at over 1,700 locations in Canada is available at wateroffice.ec.gc.ca/index_e.html. This data is collected under a national hydrometric program jointly administered under federal-provincial and federal-territorial cost-sharing agreements. It is through partnerships that the Water Survey of Canada program has built a standardized and credible environmental information base for Canada. wc

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