

Harnessing young tech talent to address key water issues in BC



The AquaHacking Challenge spurs the development of innovative water startups in British Columbia

By Melissa Dick and Corinne Jackson

The complex issues related to improving water quality, preserving water resources and optimizing water treatment cannot be resolved by a single discipline or area of expertise. However, with the right combination of technical and scientific expertise, business acumen, leadership training, and mentorship, multidisciplinary and innovative teams can create impactful and sustainable solutions. This recipe is at the heart of the AquaHacking Challenge, a competition and mentorship program designed to spark tech and business development for freshwater issues.

The AquaHacking Challenge has come to BC for the first time in 2020. It uses a model based loosely on 'hackathon' competitions but is adapted to span seven to eight months, integrating professional development and networking opportunities. Young innovators from across BC and beyond have been tasked to tackle the top five water issues impacting the Okanagan basin – one of the most water-stressed regions in Canada – and watersheds across the province.

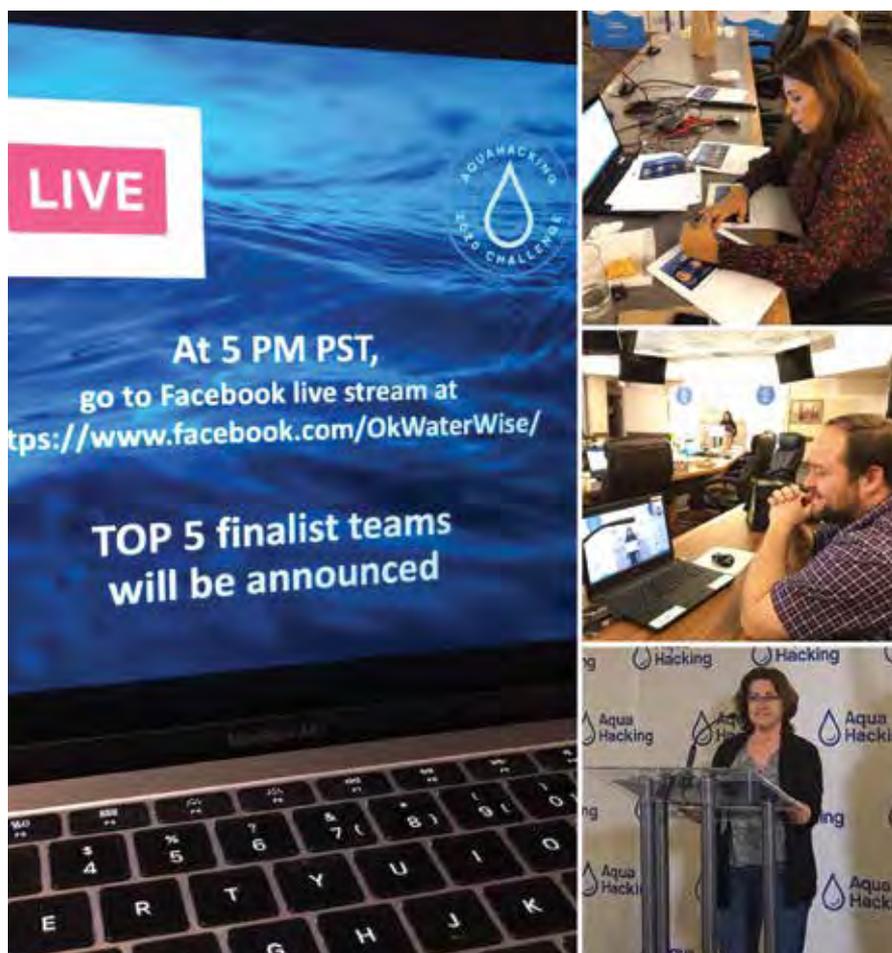
Aqua Forum, a Montreal-based non-profit, established the AquaHacking Challenge in 2015.

Since then, it has hosted one challenge per year, each focusing on a watershed within the Great Lakes and St. Lawrence River Basin. With seed funding from the RBC Foundation, Aqua Forum expanded its programming across Canada and is partnering with local water advocacy organizations to bring the Challenge to three new regions in 2020: BC in partnership with the Okanagan Basin Water Board (OBWB), Lake Winnipeg in partnership with the International Institute for Sustainable Development (IISD), and Atlantic Canada in partnership with the Atlantic Water Network.

Programming is adapted to virtual platforms in light of COVID-19

The AquaHacking Challenge traditionally includes events, networking opportunities and on-the-water experiences for participants. In response to the COVID-19 outbreak impacting Canada and the globe, the BC AquaHacking Challenge has transitioned all in-person activities to a digital platform. BC's Semi-Final event on March 21 was intended to be a science fair-style expo in Kelowna, but was adapted within the space of a week to a fully online event. Participants pitched their innovative freshwater solutions to judges in virtual judging rooms and the top five teams were announced over Facebook Live. (The one-hour live event can be viewed on OBWB's Okanagan WaterWise Facebook page at https://bit.ly/BC-AH_semi-final_FBLive.)

According to Aqua Forum Chief Operating Officer Dominique Monchamp, "We are charting new waters with this virtual event format and embrace the opportunity. The Semi-Final has always been an important in-person milestone event for the AquaHacking Challenge, but with the current COVID-19 outbreak and the importance of following the direction of health officials, we had to switch gears for the BC event – and do so quickly. Facebook Live streaming and other video conferencing technologies allowed us to still hold the event, and do so in a safe and responsible manner. This was an opportunity to leverage technology in the current context and continue to focus on important environmental programs and outcomes."



Staff from OBWB hosted the Facebook Live stream event during the BC AquaHacking Semi-Final on March 21, in which the top five teams were announced. Credit: OBWB-OKWaterWise.



The five critical water issues in the BC Challenge

AquaHackers who compete in the AquaHacking Challenge work to solve water issues selected by an advisory panel of BC water leaders by developing innovative technological solutions.

- Contaminants in stormwater: How can we improve water quality in our lakes and streams by reducing stormwater contamination?
- Residential/commercial outdoor water use: How can we reduce the amount of water used outdoors by BC homes and businesses?
- Flood damage in communities and the need to communicate flood risk: How can we reduce damage to homes, businesses and infrastructure and better communicate the risk of flooding to communities?
- Preventing and mitigating the effects of invasive zebra and quagga mussels: How can we prevent an infestation and potential damage from invasive mussels?
- Access to potable water in Indigenous communities: How can we improve access to clean drinking water for Indigenous communities in BC?

Each water issue is championed by a team of water leaders, who help the teams better understand the essence of the issue and identify technological solutions or tools to help address it. For example, the issue of Flood Damage in Communities and the Need to Communicate Flood Risk is led by Steve Litke (Fraser Basin Council), and Robin Bourke and Heather McGrath (both with Natural Resources Canada). Although flooding is a common occurrence in Canadian communities, they argue, many Canadians don't fully understand their flood risk. Terms such as '1:100 year flood' can be misleading or difficult to interpret, and a single line on a map delineating the flood zone does not sufficiently represent flood risk in a community or to a homeowner. The issue leaders are encouraging AquaHackers to create an interactive tool to communicate flood risk to raise awareness and inform actions and decisions, using data available through federal government agencies and coastal flood and hazard maps available for specific areas in BC, such as the Lower Mainland Flood Management Strategy and LiDAR data from the Okanagan region.

Marta Green (Associated Environmental) and Heather Larratt (Larratt Aquatic Consulting Ltd.) are the water issue leaders for the Contaminants in Stormwater issue. They explain how stormwater contaminants accumulate to exceed recommended concentration levels in lake

sediments, impacting fish habitat and drinking water intakes. Contaminated stormwater is also an issue in urban drinking water supply wells. Existing solutions for stormwater treatment are expensive and inaccessible to most municipalities. To tackle the issue of contaminants in stormwater, AquaHackers are encouraged to use resources such as data from municipal stormwater monitoring programs and programs such as the Okanagan Basin Water Quality Database to inspire the creation of new, tech-based stormwater management solutions and tools.

According to OBWB Executive Director Anna Warwick Sears, the BC Challenge themes of clean drinking water, flooding, water pollution, water waste and aquatic invasive species represent complex challenges that require many minds and many partners to respond.

"Initiatives like the AquaHacking Challenge increase the potential to address these issues in impactful and positive ways. It is a fantastic model for testing ideas and driving real innovation," she said.

Top Five finalist teams announced

Five AquaHacking teams were announced as the top finalists following the virtual Semi-Final event on March 21:

- **Atlantis** (from UBC Vancouver, University of Victoria and Simon Fraser University, BC)
Issue – flood risk.
Solution: Interactive online platform that makes flood risk information more accessible to the public, adaptable to changing climate scenarios, and able to integrate publicly sourced information.
- **Ozero** (Sherbrooke University, QC)
Issue – invasive mussels.
Solution: A technology to decontaminate ballast water in sport boats to prevent the propagation of zebra and quagga mussels in freshwater.

- **Elite** (UBC Okanagan, BC)
Issue – stormwater contamination.
Solution: A gravity-based filtration system that removes oil, dust and petroleum contaminants from water.
- **Hydrodynamic Labs** (UBC Okanagan, BC)
Issue – stormwater contamination.
Solution: An engineered system that fits under existing storm drain basins to remove hydrocarbon compounds, sediment, and particulate matter from the point source.
- **Agricultural Decision Support** (University of Victoria, BC, and Queens University, ON)
Issue – stormwater contamination.
Solution: A digital simulated platform that provides feedback to policymakers on the efficacy of farm incentives aimed at water conservation and nutrient management to protect water quality.

"We are so thrilled with these five teams and this very successful virtual event," said Monchamp. "In the space of five days, a completely in-person event with close to 100 participants, plus judges, mentors, advisory committee members, sponsors, plus the public, was transformed to be delivered entirely virtually. It was truly remarkable. The reality of COVID-19 is devastating, and the commitment of those who helped make the Semi-Final a success demonstrates our resilience when we come together as a community."

"I was really moved by the pitches we saw," added Sears. "It was inspiring to see young people come together to make the Semi-Final happen under these circumstances. Teams had to revamp their presentations to be delivered remotely and what they came back with was fantastic.

"Their proposals will make a difference in the Okanagan, helping us address the effects of a growing population and climate change, and the impacts these are having on stormwater,

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the spread of invasive mussels and flood risk to our communities.”

But these solutions have the potential to also help communities far beyond our valley, Sears added, noting the geographic diversity of the finalist teams.

“It demonstrates that, although the issues chosen are big here, these are issues across Canada. And, we’re hopeful that teams that didn’t make it to the finals will continue to work on their solutions through alternate programs because we need solutions, and passionate and engaged youth are important in this effort.”

These five finalist teams will receive a \$2,000 grant to support their product development, be mentored by business experts, and engage in leadership and skills-building workshops in

preparation for the Final event this summer. There, they will compete for \$50,000 in seed funding and a spot in a start-up incubator program.

BC AquaHacking Challenge supporters and partners

The success of this program requires many partners. Supporters of the BC Challenge include the Real Estate Foundation of BC (REFBC), the RBC Foundation, the de Gaspé Beaubien Foundation, and many others.

“It is through these kinds of partnerships with diverse organizations working across BC and beyond that we are collectively advancing one of the most essential aspirations of our time – a healthy environment that supports thriving, resilient, livable communities now and

in the future. That is our vision. As a grant funder of AquaHacking we are proud to help bring this unique, creative and scalable approach to BC,” says Leanne Sexsmith, REFBC’s Director of Grants and Special Projects.

For more information on the BC AquaHacking Challenge, visit www.aquahacking.com/en/bc-2020.

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