

# WEATHER WARNING:

## How the Laboratory Navigates Extreme Climate Events





The science is in: weather patterns have become more unpredictable, leading to frequent and intense extreme weather events across Canada.<sup>1</sup> Not only do heat waves, hurricanes, flooding and wildfires affect ecosystems, they also cause destruction to housing and crucial community infrastructure and take a toll on our emotional and physical health.

Extreme weather can also reduce the operational capacity of medical laboratories, forcing lab professionals to find creative ways to deliver services to patients who need it most. Through the experiences of three CSMLS members who worked during extreme flooding, snowstorms and even a post-tropical storm, it's clear lab professionals are already navigating the hazards of climate change.

### Helicoptering supplies through a storm

Canada's West Coast has had more than its share of extreme weather, including a catastrophic rainstorm in November 2021 that affected labs at two Fraser Health Authority sites in British Columbia. An atmospheric river (a long, narrow band of concentrated water vapor in the sky) caused record-breaking rain that led to flooding and mudslides.<sup>2</sup> The storm blocked highways, triggered evacuations, and stranded hundreds in the Fraser Valley.<sup>3</sup> Road closures left Fraser Health's Fraser Canyon Hospital (FCH) in Hope, BC, and Chilliwack General Hospital (CGH) "cut off from the rest of the world," according to Sarah Buchko, Transfusion Medicine Technical Practice Lead at Abbotsford Regional Hospital (ARH).

Couriers could no longer deliver critical blood products to patients at FCH and CGH, or ship samples for testing, including

urgent COVID-19 swabs, so the labs needed new transport.<sup>4</sup> "A helicopter is genius — that was really our only way," says Buchko. Fraser Health collaborated with Canadian Blood Services to deliver products to ARH, and managers then drove the packages to the helicopters that conducted runs twice a day, weather permitting. The process went smoothly in part because of extensive shipping and packaging protocols, Buchko says.

To protect patient care, both ARH and CGH increased their inventory of blood products, and FCH added products like platelets and extended their expiry date to 10 days. Buchko notes the Transparent Blood Inventory, which is part of the BC Blood Contingency Plan, allowed Transfusion Medicine to look at inventory levels across the region and move products without involving the sites. "It was one less thing they had to worry about during this stressful time," she said. The lab team also reached out to the hemophilia clinic in Vancouver to see if stranded patients needed blood products or supplies.

One concern was that Fraser Canyon's lab, which is housed in the basement, might get flooded. The team was ready for evacuation, with lab staff advised to grab priority items and leave everything else behind. Fraser Health also had a plan to send J82 boxes and packing supplies to Fraser Canyon Hospital so that plasma, red cells, and reagents could be shipped to ARH if they had to evacuate. Buchko's takeaway: never put critical patient care services in the basement.

The flooding also affected Fraser Health East staff on an emotional level. Some worried about neighbors whose houses had been washed away in a mudslide, while others were concerned about whether



they could get groceries. For Buchko, it was “heartbreaking” to see many farms destroyed, as well as the beautiful Othello Tunnels trail she had hiked the summer before. From transfusion needs to washed-out trails, this rainstorm left many reeling.

### **Skiing to work during “Snowmageddon”**

East Coasters have also faced an increasing number of extreme weather events. Take Newfoundland’s “Snowmageddon,” a 2020 blizzard so crippling that the City of St. John’s declared a state of emergency (SOE) and called in the Canadian Armed Forces for help.<sup>5</sup> This storm, which closed roads and caused an avalanche, ranked as Canada’s fifth most significant weather event of 2020.<sup>6</sup> More than 76 cm of snow fell on top of an existing 40 cm of snow, creating towering snowbanks on the grounds of Eastern Health’s Health Science Centre, an acute care hospital where Claudette Mosey, then Regional Operations Manager for the

Biochemistry and Genetics Laboratories, worked.

Laboratory management met regularly over the first 48 hours of the eight-day SOE, says Mosey, now Regional Laboratory Manager of Public Health & Microbiology at St. John’s Dr. Leonard A. Miller Centre. Leaders activated emergency and contingency management plans and service needs were operationalized through an Emergency Operations Centre.

Keeping laboratories staffed was a challenge. When the SOE was issued, many staff could not commute to work or return home after their shift. In Newfoundland, staff are often prepared for impending weather, but Snowmageddon topped the charts, Mosey says. One laboratory chief brought an air mattress to work, another manager made a makeshift bed with a pillow and cardboard boxes, and staff slept in a lounge during rotated rest periods. After the first 24 hours, some employees walked and, in one case, skied into work to

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relieve tired colleagues, Mosey recalls.

Due to grounded airlines, specimen testing at the provincial esoteric laboratories was limited and out-of-province referral testing was delayed. Laboratories needed authorization for essential road couriers to transport critical supplies, blood products, and specimens between city labs. When fuel supplies became low, essential employees were required to show hospital IDs to purchase fuel.

“We have to anticipate the challenges that living on an island can bring and the potential risk for delays in obtaining critical laboratory supplies,” says Mosey about the lessons learned from the experience. “We’re constantly re-evaluating our inventory and utilization to ensure we have enough supply on hand.”

Communication is essential when navigating through significant storms, she adds. The storm taught the team how to communicate and understand needs and challenges across all services. “It taught us to think outside the box — what do

we have, what do we need, and how do we get there,” she says. It also brought teams together and promoted a sense of community, she added, pointing to how some managers served meals to staff during the SOE. “Our laboratory team showed immense dedication to our profession and our patients,” says Mosey. “It made me proud, not just as a manager, but as a lab professional.”

### Coping with heavy rains and a hurricane

Last fall, Hurricane Fiona (later downgraded to a post-tropical storm) became the top Canadian weather story of 2022.<sup>7</sup> It belted parts of Atlantic Canada, including southwestern Newfoundland, with heavy rains and powerful winds, storm surges, and high waves. “It was devastating to see what people were going through,” says Jeanette Grabka, Regional Director of Laboratory Medicine at Western Health. In Port aux Basques, Fiona, potentially the deepest low-pressure system ever recorded

on Canadian soil,<sup>3</sup> destroyed multiple homes and swept one local woman out to sea.<sup>8</sup> “One of the biggest challenges [for our team] was to manage and respond appropriately when everybody was in such emotional turmoil,” Grabka says.

Within the laboratory, the storm caused routine blood collections to be cancelled for a few days and lab teams had to work with a damaged water system. They had to rely on point-of-care instruments instead of chemistry analyzers, which use a lot of water. But, within 48 hours of the storm,

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supplies and samples could again be transported between Port aux Basques and Corner Brook, she says.

Weather-wise, 2021 was a harder year for Grabka and her colleagues, starting with a heavy rain in April that washed out sections of the Trans-Canada Highway, cutting off the southwest coast of Newfoundland.<sup>9</sup>

Western Health was expecting a delivery of swabs for a COVID-19 testing clinic serving 300 at-risk patients, and not even a major crater in the highway between Corner Brook and Gander could stop them. Staff from both Central Health and Western Health drove to either side of the crater, then the Central Health driver walked the swabs around the crater to the Western Health driver. After that exceptional handoff, supplies and samples were transported back and forth by airplane.

Seven months later, multiple road washouts cut off the Port aux Basques area for weeks,<sup>10</sup> and labs relied on helicopters for transportation. Trusting that critical products like platelets would be delivered to patients on time was huge, says Grabka: “The communication and the relationships with the Health Emergency Management team is what made us so successful.... That’s not something you can do at the point of the disaster; those things have to be established over the years.” She is also grateful the lab team had previously developed a service continuity plan. “When you’re in the midst of an emergency, trying to think quickly and make decisions with everything going around your head, I found it very grounding to go back to the plan.”

Looking forward, Grabka notes that Western Health has changed its approach

around weather. “We’ve always had difficult, ugly weather. We’re used to that, and we always brushed it off. ‘Oh, we’re getting snow, big deal. Oh, we’re getting freezing rain, big deal,’” she says. “Now, if they’re calling for a lot of rain on the southwest coast, we immediately connect with these labs to remind them to prepare.” In terms of planning, she adds this: “I think we need to start extending and broadening our considerations when we’re identifying possible vulnerabilities to include weather events — that we’ve rarely done before.”

In each of these cases, medical laboratory staff went above and beyond to maintain patient care during devastating and historic climate events. Since these more frequent and severe weather events, along with other effects of climate change, are sure to reoccur, medical laboratory professionals will continue to navigate and adapt to deliver patient care, despite the odds. ■



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