

Going North to Help Gauge Global Water Supply

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By Lisa Johnson

In the Sheep Creek Basin in Ivvavik National Park, in Canada's far northwest corner, Stacey Dumanski took full advantage of the amazing 24-hour sunlight this summer to do fieldwork that could help improve global water prediction.

"We are entering a global water crisis, and given rapid climate change and resource development in the North, this work is urgent," says the fourth-year University of Saskatchewan student.

Water shortages due to climate change could seriously affect Canadians and people all over the world. Dumanski's research in the remote creek basin will help policy makers better understand water resources in cold regions and predict the global water supply.

A 500-square-kilometer watershed accessible only by tundra plane, the Sheep Creek Basin had never been studied by hydrologists before Dumanski arrived. Likely to face dramatic temperature changes and forest expansion in the future, the basin has unique hydrological characteristics compared to other water basins under study.

Dumanski's work is part of the International Polar Year Project and the IP3 research network funded by the Canadian Foundation for Climate and Atmospheric Sciences and the federal Natural Sciences and Engineering Research Council.

She also received support from Parks Canada, since her work will help them predict effects of climate change in the area, preserve the water cycle, and start important water conservation plans in northern parks.

She camped in a tent near an old mining site for a two-week experience that was unlike any other.

"It felt and looked like early evening when it was really two in the morning," she says. She faced freezing winds, but never had to use a flashlight. She was cut off from phone, internet, electricity, and access to running water.

Each day usually began with a nine-kilometre mountain hike to survey the area. Since hydrologists need to know the watershed area down to the smallest detail, Dumanski measured and collected data on soil moisture, tree density, and nearby vegetation. Most often, though, she was measuring streams—their depths, turbulence, and water flow.

Working for John Pomeroy, Canada Research Chair in Water Resources and Climate Change and director of the U of S Centre for Hydrology, Dumanski will contribute her findings to Pomeroy's cold regions hydrological model.

Developed at the U of S through 10 years of research, the computer model was created to help predict water cycles without having to use expensive gauges.

"Her work at Sheep Creek will demonstrate what it takes to study an area where there is no stream gauge in place to measure water flow," says Pomeroy, who leads an international research project on prediction in ungauged basins.

"We'll use her information to set parameters in a computer simulation of the water cycle."

Pomeroy says it's critical for people running a water simulation to spend time in the field so that they know the place and can effectively assess the results when they apply the data to the model.

"You just can't get that from Google Earth," he says.

Looking at the ecology of the North will provide a better measure not only of water flow in the area, but of cold regions around the world, says Pomeroy. It will help refine climate change models, and in so doing, improve global prediction of weather, climate, and water resources.

Dumanski, whose background is in theoretical sciences such as math and statistics, wanted to study



Stacey Dumanski in Ivvavik National Park, Yukon (Photo by Andrew Fehr)

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Dumanski, whose background is in theoretical sciences such as math and statistics, wanted to study water management issues because they are worldwide problems.

“Hydrology is more important than ever,” she says. Her time spent in Ivvavik had a huge effect on her career plans, helping her to see that, more than in anything else, her aspirations are in fieldwork.

This fall, Dumanski is applying the data she collected to the model. She will graduate in the spring with a major in physical geography and a minor in water science.

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Lisa Johnson is a student intern for the U of S research communications office. Visit www.usask/research for more stories of student research.

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