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Technology

Better water science needed

BY JOHN POMEROY, SPECIAL TO THE STARPHOENIX MAY 28, 2010

The following is the viewpoint of the writer, Canada Research Chair in Water Resources and Climate Change at the University of Saskatchewan.

Given Saskatchewan's wet spring, it may seem like odd timing to be raising alarm bells about the potential for long-term water scarcity on the Prairies due to climate change.

But even record rainfalls have a negligible impact on the South Saskatchewan River that sustains our cities, towns and industry. What affects our long-term water supply and regional water use is the snowpack of the Canadian Rockies.

As a scientist monitoring that snowpack and the ensuing water flows so critical for our economy and ecosystem, I see several troubling signs.

The Rockies have experienced a three- to four-degree increase in warming since the early 1960s. As a result, about a quarter of the glacier areas have disappeared in the same period of time.

Second, the winter snow period is shorter by one to two months in the Rockies, compared with the early '60s. Predictions are that the trend toward a shorter snow period will continue and that by the late 21st century mountain snowpacks will be less than half of what they are now.

This will provide greatly reduced and much earlier runoff to the headwaters of the South Saskatchewan River.

At the same time, due to warming on the Prairies there will be complete mid-winter melting of our snowcover and greatly reduced spring runoff to small prairie streams and sloughs.

The record dry winter just experienced in Alberta is perhaps a harbinger of what is to come in the latter part of this century. Parts of the Rockies are very dry. This is occurring when consumption of South Saskatchewan River water has grown such that no new water use licenses are available in Alberta.

These are disturbing trends for Saskatoon. The South Saskatchewan River is already one of the world's most threatened rivers. Inflows into Lake Diefenbaker -- Saskatchewan's single most important water supply for more than 750,000 people -- have dropped 15 per cent since the early 1900s due to reduced natural flows from the Rocky Mountain headwaters.

When increased upstream water consumption is added in, the rate of decline is actually 40 per cent.

The economic cost of prolonged drought is huge. The 1999-2004 Prairie drought was the most expensive natural disaster in Canadian history. According to a Saskatchewan Research Council study, the gross domestic product declined by \$5.6 billion, revenues from agricultural production dropped by \$3.6 billion, and 41,000 jobs were lost.

We are not in a crisis yet, but we urgently need to develop better water science and management approaches before we do face a crisis.

In particular, we need better monitoring of streamflow, snowfall, rainfall, and temperature changes and better models for predicting the effects of winter warming on water. Streamflow forecasting is becoming increasingly important to agriculture, urban/regional planning, policy development, conservation, and industrial and resource development.

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And we need strategies for involving the public in more efficient use of our water resources.

To this end, it is very heartening that the federal and Saskatchewan governments have each invested \$10 million in the recently announced Canada Excellence Research Chair (CERC) in Water Security at the U of- to be led by internationally acclaimed hydrologist Howard Wheatler.

Speaking Thursday in Ottawa at the Canadian Water Security symposium, Wheatler stated, "What we are seeing all around the world is unsustainable use of water resources. We need to be safeguarding the environment for future generations. We need new science, new technologies, new decision support tools and engagement with society."

By creating a global research institute with an interdisciplinary focus, this CERC initiative will go a long way toward breaking down disciplinary barriers so that scientists and policy researchers from diverse areas of study work together to help better understand and sustainably manage our water supplies. And the CERC is advancing U of- leadership of Canadian water research.

Ironically, however, the very group that organized the national gathering of water scientists, the Canadian Foundation for Climate and Atmospheric Sciences, will run out of federal funding in 2011. The CFCAS funds two U of S-led water science research networks -- the IP3, which studies effects of climate change in cold regions, and the Drought Research Initiative -- that are critical to helping find solutions to Canada's water issues.

The IP3 network involves more than 80 scientists and students across Canada, the U.S. and Europe including about 25 at the U of S. Without this network funding, we will be left with a piecemeal system of individual scientists and researchers applying for small amounts of funding on a random basis for often disconnected water research projects -- rather than a coordinated national approach to addressing critical water security problems.

The federal government is to be commended for its foresight in investing in the CERC at U of- which is really an investment in our region's future as well as in finding sustainable solutions to national and global water issues. Given that the work of the CFCAS-funded research networks greatly complements and enhances the research collaborations that will be fostered by the CERC initiative, it would be a shame to see the CFCAS forced to close next year.

Water research in Canada has perhaps never before been so important to us all.

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