



Working together for a healthy Elbow River Watershed

Eyes on the Elbow

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## Climate Change and the Elbow River Watershed

By Ann Sullivan

In early November 2019, more than 11,000 scientists from around the world declared that the Earth is in the midst of a climate crisis. The scientists were not the first to make the statement. In June of this year, Canadian politicians also passed a motion to declare a climate emergency, noting that Canada is warming twice as fast as the rest of the planet.

David Sauchyn, director of the Prairie Adaptation Research Collaborative (PARC) at the University of Regina, is perhaps more aware than most of the effects of climate change on our country and planet. Sauchyn, a professor of geography and environmental studies, has been studying climate change for 40 years. Starting in the 1990s, he became aware that there was “a whole social and political element” to climate change. “It’s really hard these days to separate the science and the reaction people have to it,” he said.

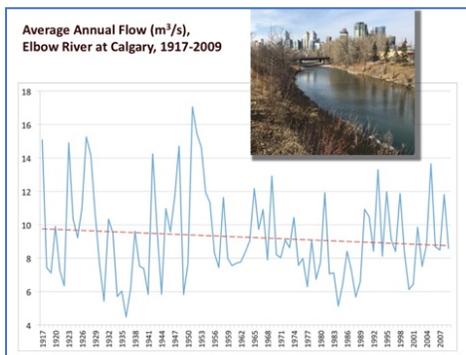


Figure 1

Closer to home, how is climate change affecting the Elbow River watershed? Research has shown that flow in the Elbow is slowly declining (*figure 1*), but Sauchyn says that decline is not as big a concern as our general lack of water conservation. On the whole, he said, Canadians do not use water very efficiently. For example, most of us soak our lawns and wash our vehicles with treated water. “We need to be less consumptive and more conservative with water,” Sauchyn said. “There’s still a lot of water conservation that could be achieved.”

Climate change will also bring greater variability in river water levels from year to year. “There’ll be an increase in range between very dry and very wet,” Sauchyn said, noting that this “amplification of the hydrological cycle” will mean both more severe droughts and heavier precipitation. “On average, you would expect less water as the climate changes,” he said,

noting that storms, when they do come, will likely be more intense and include more precipitation.

Prairie rivers, which rely on snow melt and runoff for their water supply, are particularly vulnerable to climate change. The Elbow River may find its source in Rae Glacier in the eastern slopes of the Rockies, but glaciers provide only a fraction of the water that flows into Calgary. The vast majority comes from snow melt and spring runoff, which is why river flow rates are currently highest in June (*figure 2*).

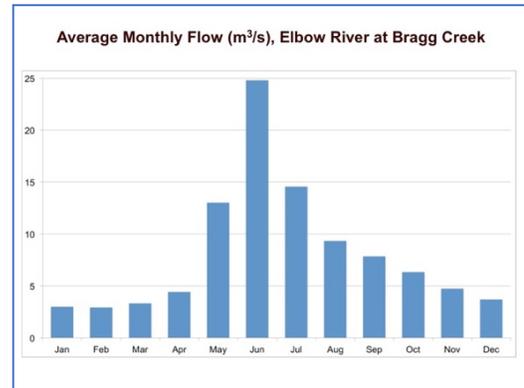


Figure 2

Climate change will likely change the timing of high and low flows on the Elbow. With a changing climate, spring runoff is predicted to happen earlier in the year, leading to highest annual flow rates in May (*figure 3*).

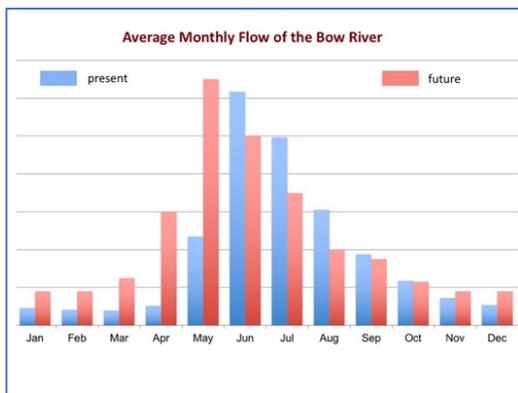


Figure 3

“All rivers on the prairies will have more water in the winter and spring,” Sauchyn said. “The problem is we need the water in the summer.”

According to Sauchyn, the City of Calgary is one of the most progressive cities in the country on the subject of water. Calgary is well situated on two rivers (the Elbow and the Bow), but demand for water is also very high because of the city’s large – and growing – population.

Éowyn Campbell, a University of Calgary PhD candidate who has studied the Elbow River extensively, agrees that Calgary has top-notch water treatment. “The City of Calgary has a world-class water treatment system and the water it returns to the Bow (which it takes from both the Bow and Elbow) is very good quality,” Campbell said in an email. “But that result is due to conscious and careful decision making and allocation of a LOT of money.”

Proposed new developments west of Calgary along Highway 8 could put increased pressure on the Elbow, which currently provides about 40 percent of Calgary’s water supply. Rocky View County, part of which lies within the Elbow River watershed, is in the process of creating a new Municipal Development Plan (MDP), which will likely go to council for a vote sometime in 2020.

Several developments have been proposed along Highway 8 in the Elbow watershed, including Double Creek, which could add 7,000 housing units and close to 19,000 residents. Another development further west along Highway 8 could also pull more water from the Elbow and put more treated water into the river upstream of Calgary. Managing the cumulative effects of development on a river the size of the Elbow will be a key challenge in future. Campbell said smaller communities might lack the funds for high-quality water treatment. “My concern with development in Rockyview,” she said, “is that with a smaller tax base, the temptation to cut corners and put in water treatment systems that meet only the minimum standards would be strong.”

No new river-connected aquifer wells are allowed in the South Saskatchewan River Basin (which includes the Elbow River), but Campbell said there are existing water licences that developers could use.

Rocky View County citizen Dave Klepacki, a geophysicist with more than 30 years’ experience and co-creator of Experience Journeys, worries about the impact of development on the river. “In the face of climate change, we need to protect the watershed,” Klepacki said. More people living close to the Elbow will mean more pollution in the river, from lawn chemicals to vehicle pollution and human waste. “The bottom line is that developing the Highway 8 corridor is going to contaminate the aquifer. Full stop.”

*“It would be hard to design a threat more likely to induce highly abstract thoughts.”*

**Why don't we care about climate change?**  
Dan Gardner, *The Globe and Mail*  
December 21, 2018

- *So why isn't our collective concern remotely proportionate to the danger?*
- *What dominates our forward-looking thoughts is **the here and now**, or the nearby and soon.*
- ***Climate change is distant** in every dimension. The worst of it lies decades in the future, to be suffered in far-off lands by foreigners very different from us.*

Figure 4

Both Klepacki and Sauchyn agree that we need to change our behaviour to slow the effects of climate change. Sauchyn remains positive, but he notes that, unfortunately, the only thing that might wake us to the real dangers of climate change is “trauma in our communities,” something many of us experienced in the floods of 2005 and 2013.

Sauchyn said governments need to take action to fight climate change because individuals can’t be expected to make major changes (such as creating a rapid transit system) without government

support. “Voluntary stuff sounds nice,” he said, “but it never works.”

As for Campbell, she is hopeful that the resilient Elbow can support more people and the effects of climate change. “I do believe that the river can provide water to more people than it does currently, with careful management,” she said in an email. “The aquifer/river absolutely cannot support any more private withdrawals . . . but the idea of withdrawing during peak flows and storing the water [which the city currently does in the Glenmore Reservoir] is actually sensible.”

*All slides courtesy of Dr. David Sauchyn, from a presentation to the Calgary Metropolitan Region Board in May 2019.*