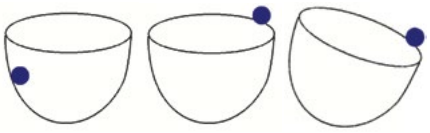
What producers have taught a scientist about weather and climate

Dr. David Sauchyn

Dr. Sauchyn is the Senior Research Scientist at the Prairie Adaptation Research Collaborative (PARC). His main research interest is in the climate of the past millennium in Canada's western interior and what past climate can tell us about the climate to expect in the near future.

"Keeping the Marble in the Bowl" - that was the title of a breakfast briefing I gave MPs on September 29, 2009. Parliament was hosting some talks on climate change prior to COP15 (the 15th Conference of the Parties) in Copenhagen. My talk was inspired by a woman who farms near Lloydminster. I met her at a gathering of producers in a community hall in Vegreville. First she said my presentation was 'farmer friendly', which I took as a big compliment. Then she told me she sees the fluctuations in our weather like a marble rolling up and down the sides of a bowl. When the oscillations are large, between extreme wet and dry or severe hot and cold, the marble flies out of the bowl. She had another insight – by altering the climate system, humans have tipped the bowl and the marble can fly out more often. Adaptation is what governments, communities and individual producers do to keep the marble in the bowl and prevent damage and loss from extreme weather and climate change. I often use her analogy, acknowledging the source. I even drafted this cartoon to illustrate it.



Of course it's not hard to engage a farmer or rancher in a conversation about weather and climate, and I've had lots of opportunities. For the past 30 years, my field assistants and I have collected old wood to reconstruct past climate from tree rings. Most of this wood was found on land owned or leased by cattle producers in the foothills of the Rockies and in the forested uplands and river valleys of the plains. Gaining access to the land usually involves explaining what we're doing which leads to a conversation about the weather. Then there are the almost 300 talks that I've been asked to give to producer associations, rural communities, watershed stewardship groups and agricultural agencies. And another source of producers' observations is my colleagues' research in the social sciences; we combine our studies of the social and environmental dimensions of climate change. This gives me access to information from interviews with hundreds of producers.

I am always looking for new ways to explain climate change to a public audience. A great source of anecdotes and analogies is the audience itself; in my case, mostly people in the agricultural industry. For example, at a talk in Taber, the manager of an irrigation district said

"Dave, I'll believe in climate change when we get unexpected weather". I thought wow, now there's a great definition of climate change – weather we don't expect. It might take some very unusual weather, again and again, to prove that our climate has changed, because on the prairies we often get extreme weather and we would get it even in the absence of climate change. To put it another way, global warming very likely is making our weather more volatile, but this human-amplified weather still falls within the range of natural variability.

Another bit of information that I use to explain climate change, and specifically to differentiate it from natural variability, comes from folks who ranch south of the Cypress Hills. They told a colleague of mine about a water conservation project that only locals would be aware of in this remote corner of southwestern Saskatchewan. Ducks Unlimited had built a canal to divert runoff into a small shallow lake to turn it into a 'duck factory'. The most interesting aspect of this project, from a climate perspective, is that it was built in 1947 and abandoned in 1976. These were the exact years of significant shifts in the climate regime of western Canada. In the decades prior to 1947 and after 1976, there were many dry years, while only a few dry years (notably 1961) occurred between 1947 and 1976. Thus the DU project was viable only during this wet phase of prairie climate. People who work outside, making a living that depends on the weather, are well aware of this natural tempo of water and climate.

Scientists, on the other hand, are best at producing data using electronic instruments, otherwise known as sensors and computers. Without some kind of context, however, scientists produce just a bunch of numbers. Producers are a source of social, economic and environmental context. For example, while scientific data suggest that our weather is getting more extreme, it's hard to reach this conclusion with a lot of confidence because extreme events are infrequent and thus the sample size is small. Scientists use data from sparsely distributed weather stations. People who live in rural areas can tell us much more about the severity of drought, storms and floods, and especially the impacts. Observations like:

Weather and wetlands.

Photo courtesy of Dr. David Sauchyn

- "Dad ran 20 plus years of hail insurance. What do you need that for, I mean, he never got hailed. We have had hail now seven out of the last eight years so I don't know what is changing with climate but the perception or the feeling you get is you have harsher storms, you have more hail on your hay and your crops, which drives your hail premiums up."
- "Three generations of ranchers and farmers in Saskatchewan have taught us how to deal with drought. Unless we got a really nasty four or five-year drought like they talk about at the climate change meetings, but one or two-year drought we can always handle."

One more story … following a talk in the hockey rink in Sedgewick (not far from farms in my extended family, so an aunt and a cousin were there), a producer asked "why do you keep collecting wood, don't you have enough." I had mentioned in my talk that I've collected more than 6000 pieces of old wood. That was a great question, one that nobody had ever asked me before. So I wasn't sure how to respond, except to say something about how replication is a fundamental scientific principle. On the drive home to Regina, I pondered that question and thought about research that could exploit such a large archive of old wood. Since then our lab has analyzed the climate of western Canada from an approach only possible with a large amount of tree-ring data. So I have that producer, and his good question, to thank for prompting me to think about why we've collected so much wood and how our lab can use this to our advantage.

I could write a book, or make a video, about these and many other conversations I've had with producers about weather and climate … maybe I will! FFT

Do you have a story about weather or climate? Send it to David Sauchyn at readers@farmingfortomorrow.ca