The Magnificent Seven : understanding builds better bridges (and culverts)

Spence, Christopher

Global Water Futures Prairie Water

Artwork: Ken Van Rees

The Magnificent Seven

Understanding builds better bridges (and culverts)

Christopher Spence, Research Scientist, Environment and Climate Change Canada

It was 2017 and the Global Water Futures Prairie Water research team faced a significant challenge. Initial discussions with different communities across the region resulted in a key question that came up again and again; "How many wetlands must we keep?"

Decades of research on the impacts of wetland drainage have made it clear. Removing wetlands has substantial adverse impacts on biodiversity, flooding, and downstream water quality. However, drainage is a widespread and profitable agricultural practice. The freedom to manage water on their own lands is a value tightly held by many producers. Answering this question and communicating the information in a palatable and non-accusatory way to communities would be difficult.

Conducting a traditional research program in a test watershed would not solve the problem. The social scientists among us, those who live and breathe engaging with people, knew that we would face criticism about the representativeness of our results across the diversity of Prairie landscapes. Furthermore, investigating a specific place could result in people feeling blame for perceived adverse impacts of their actions.

The solution, we thought, was to develop a regional approach.

The idea, spawned at a series of workshops my team members organized with stakeholders, was to classify every small watershed across the Prairie into one of seven classes. We then attempted to build a hydrological model of the prototypical watershed in each class, in which we could manipulate the climate and wetland extent to determine impacts. Because the models simulated the response across every watershed type, we modelled everywhere, but because it was of the "average" watershed, it was also nowhere.

When we finally rolled out results four years later, instead of only being able to say "Martha's farm is responsible for algal blooms", we could say "Widespread drainage on landscapes like those on Martha's farm has these types of impacts". It was a nebulous yet precise solution. The outcome was that people were very receptive to what we had to say. It was interesting that different groups took different things away from the exact same data.

Downstream residents were the most vocal and felt our results vindicated what they already believed. Water managers have been systematically evaluating the results and building policies based on the new information. Agricultural producers, too, were receptive. A producer called me one day and we spoke for the better part of an hour. He said he liked our engagement strategy to develop research questions and methodology. He even volunteered his land if we were interested in conducting future field-scale studies. He valued how we listened to him and other producers and their perspectives as we communicated our results. He explained, "I'm still going to drain; it's too much opportunity lost if I don't, and now I know how I can reduce downstream impacts as I do."

That people with divergent views can have respectful dialogue about such a contentious subject is an example of why Prairie Water has been among the most successful projects of which I have been a part.

Find out more:

Spence, C., He, Z., Shook, K.R., Pomeroy, J.W., Whitfield, C.J. and Wolfe, J.D. (2022). Assessing runoff sensitivity of North American Prairie Pothole Region basins to wetland drainage using a basin classification–based virtual modeling approach. Hydrology and Earth System Sciences 26: 5555–5575 https://doi.org/10.5194/hess-26-5555-2022.