



Prairie Drainage Governance

Understanding agricultural water management during times of change

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BACKGROUND
<p>Drainage is the management and removal of water from agricultural lands which can be for the purpose of allowing earlier spring seeding, increasing the amount of productive land, improving soil conditions, and facilitating use of new technology (Weber & Cutlac, 2017; Wheeler et al., 2013). However, drainage, particularly surface drainage of wetlands, can negatively affect water quality, biodiversity, and risk and resilience to drought. The risks, impacts, and benefits of drainage are unevenly distributed across catchments and stakeholders. Additionally, in Saskatchewan, drainage policy differs across and within jurisdictions, and regulations are not fully enforced. As such, it is little wonder that debate and conflict over drainage has been ongoing for more than a century (Blann, Anderson, Sands, & Vondracek, 2009).</p>
RESULTS AND OUTCOMES
<p>Our work will help build a better understanding of how people develop institutions to govern water, how existing institutions function, and how conflict or collaboration emerges.</p> <p>The three intended outcomes of this research are:</p> <ol style="list-style-type: none">1) A clear understanding of the governance workflow for managing drainage and addressing related conflict in both wet and dry regimes;2) Identification of opportunities for improving nutrient mobilization and increasing watershed resilience; and3) The linking of the human dimension to hydro-climate models, in order to forecast possible societal responses based on projected climatic and hydrological change, in order to understand potential barriers and opportunities for the implementation of practices to minimize negative impacts of drainage.

PROGRESS TO DATE
<div><div><p>PERSPECTIVE published: 30 October 2018 doi: 10.3389/fenv.2018.00120</p></div><div><h3>When a Water Problem Is More Than a Water Problem: Fragmentation, Framing, and the Case of Agricultural Wetland Drainage</h3><p>Sarah-Patricia W. Breen^{1*}, Philip A. Loring² and Helen Baulch¹</p><p>¹Global Institute for Water Security, University of Saskatchewan, School of Environment and Sustainability, Saskatoon, SK, Canada, ²Department of Geography, Environment, and Geomatics and the Aral Food Institute, University of Guelph, Guelph, ON, Canada</p><p>Complex interactions between water, society, the economy, and the environment necessitate attention to how water issues are framed, and the limitations of a water-centric framework for analyzing or solving problems. We explore this complexity through an example of an existing complex, or wicked, policy problem—the case of agricultural wetland drainage in the Canadian Prairies. Agricultural wetland drainage expands the amount of productive agricultural land, increasing agricultural efficiency and productivity. Drainage is also one of the primary drivers of the loss of Canada's wetlands and is a hotly contentious issue between actors with divergent views and values in the Canadian Prairies. Using the nuances of drainage as an exemplar, we discuss how fragmented framings of water foster perspectives and solutions that fail to consider the full range of aspects and interactions, and contribute to the enduring conflicts that accompany drainage debates in many regions. First, we discuss agricultural wetland drainage as practiced in the province of Saskatchewan, where significant regulatory and governance changes are in progress. Next, we discuss the challenges of policy and governance fragmentation, both specific to water and to the surrounding system. Finally, we note potential alternative framings that, while specific to prairie water governance, provide guidance for how other complex social-ecological challenges might be approached.</p><p>OPEN ACCESS Edited by: Arif Ehsanul, Griffith University, Australia Reviewed by: Luiz Ubaldino Hap, Universidade Federal Integrada do Alto Uruguai e das Missões, Brazil Teresa Ferreira, Universidade do Litoral, Portugal *Correspondence: Sarah-Patricia W. Breen, sarah.breen@usask.ca Specialty section: This article was submitted to Freshwater Science, a section of the journal Keywords: water governance, agricultural wetland drainage, fragmentation, water policy, framing</p></div></div> <div><p>Breen et al. (2018) discuss the policy challenges and governance fragmentation of agricultural wetland drainage in the Canadian Prairies. Find this paper, a deliverable from the Prairie Drainage Governance Project, online in <i>Frontiers in Environmental Science</i>.</p><ul style="list-style-type: none">• This project is moving forward with a focus on the Dry Lakes network in Saskatchewan. More cases will be added as appropriate.• 10 stakeholder interviews have been conducted so far. These interviews will be transcribed and analysed.• We will produce a short-film that will explore perspectives on Drainage.</div> <div><div><div>Case Studies</div><div>Emergent scholarship</div><div>Interviews & Multimedia</div></div><ul style="list-style-type: none">• Conceptualizations of the SES framework are being investigated through the social-ecological model of existing drainage governance.</div> <div></div>

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REFERENCES
<p>Blann, K. L., Anderson, J. L., Sands, G. R., & Vondracek, B. (2009). Effects of Agricultural Drainage on Aquatic Ecosystems: A Review. <i>Critical Reviews in Environmental Science and Technology</i>, 39(11), 909–1001.</p> <p>Epstein, G., Vogt, J. M., Mincey, S. K., Cox, M., & Fischer, B. (2013). Missing ecology: Integrating ecological perspectives with the social-ecological system framework. <i>International Journal of the Commons</i>, 7(2), 432–453.</p> <p>Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. <i>Science (New York, N.Y.)</i>, 325(5939), 419–22.</p> <p>Weber, M., & Cutlac, M. (2017). Agricultural and Water in Canada - Challenges and Reform for the 21 C. In S. Renzetti & D. Dupont (Eds.), <i>Water Policy and Governance in Canada</i> (pp. 395-416). Switzerland: Springer International Publishing.</p> <p>Wheater, H., Bennett, E., de Loë, R., Friesen, R., Hamilton, K. E., Hepworth, L., ... Van Acker, R. (2013). <i>Water and Agriculture in Canada: Towards Sustainable Management of Water Resources. The Expert Panel on Sustainable Management of Water in the Agricultural Landscapes of Canada</i>. Ottawa: Council of Canadian Academies.</p>