

Special Issue Introduction: Climate Change Knowledge Translation

EDITORS OF SPECIAL ISSUE ON CLIMATE CHANGE

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Worldwide, communities are experiencing the effects of climate change, ranging from droughts and forest fires, to sea level rise and unpredictable and severe weather patterns. The impacts of these changes are threatening roads, buildings, water and energy systems, community health and well-being, as well as ecological integrity, food provisioning, and economic vitality (Vodden, et al., forthcoming; IPCC (in press); Field, et al., 2014).

The ability to respond to these climate change impacts is key to community resilience. Effective responses require both enhanced information and action, and now more than ever, it is vital that universities and colleges engage with communities to meet these growing needs. Through this special issue, we aim to contribute to these community-research dialogues and collaborative action research by bringing together a collection of papers that consider how climate change knowledge generation and translation can support community actions for climate change resilience.

By knowledge translation, we mean any technique or process that results in productive, transformative information flowing between different groups. The aim is to move away from what Cornell et al. (2013) call ‘closed knowledge systems’—that is research networks where knowledge and findings are shared internally, and disseminated through one-way communication with stakeholders—and toward a richer, change-inducing dialogue between diverse partners and stakeholders. As the articles in this special issue demonstrate, contexts and supports for richer dialogue can include community meetings, exhibitions, workshops, online platforms, toolkits, community radio, and various other media and approaches.

Our interest is in how knowledge networks are created, information is shared, and trust built to support community climate change adaptive capacity. We view knowledge translation as a dialogue that includes a collaboration of

community, governmental, NGO, and researcher voices all seeking innovative solutions and strategies. Through this, we deliberately place, emphasis on multi-way communication: a way of exchanging information that recognizes local knowledge, opens doors to active participation in decision-making by community groups and organizations, and creates opportunities for researchers both to share findings and reflect on the interpretation of that information (Borquez et al., 2017; Olson & Pinto da Silva, 2020).

We see a vital role for universities and colleges in building knowledge translation networks on climate change. Universities and colleges are often embedded in their local communities and they are well placed to create the venues that can shape dialogue and action on climate change responses. They are also sites that generate research, train students, and have the capacity to initiate meaningful conversations about climate change. While research is often led by academics, experience has shown that climate change adaptation research is often most impactful when communities play an active role in developing and managing research projects, as well as translating and sharing their results, and when adaptation is considered “through the lens of place” (Peace & Myers, 2012; Picketts, Werner, Murdock, Curry, Déry, & Dyer, 2012; Groulx, 2017). Durable academic-community relationships can enable more accurate and relevant research data, the translation of scientific and social data into formats that are more readily usable to communities (Biesbroek, Klostermann, Termeer, & Kabat, 2013), and the ongoing monitoring and adjustment to adaptive actions that might emerge from these collaborative initiatives. In a context where climate change policies are fragmented—for instance, greenhouse gas mitigation policies action lies mostly with national governments, while flood reduction adaptation lies with municipal land use planning—the ability to build a diverse and interdisciplinary conversation is essential.

This special issue began in the context of one such conversation, held in Newfoundland and Labrador, the eastern most province of Canada, in May 2018. That conversation took the form of a workshop that brought together researchers, students, community members, and practitioners to discuss the impact of climate change on local coastal communities. The three-day event was hosted across two locations: the Town of Norris Point, in the UNESCO-recognized Gros Morne National Park, which has seen increased coastal erosion, road washouts, and extreme weather events over the last few decades; and in Corner Brook, at the Grenfell Campus of Memorial University of Newfoundland and Labrador, which is home to interdisciplinary environmental programs. Joined by researchers from across Canada, practitioners from provincial agencies and regional organizations, and community members from the Gros Morne region, the event included presentations, roundtable discussions, and open conversations, all broadcast on local radio and, later, via the workshop's online repository. The Gros Morne workshop was supported by local and national agencies, including the Social Sciences and Humanities Research Council of Canada, whose contributions we gratefully acknowledge.

The workshop led many of us to consider the mechanisms for knowledge translation on climate change, what best-practice lessons are available from the experiences of other university-community networks, and the role for universities in spurring such dialogue. This special issue builds on those conversations. As an editorial collective of researchers, practitioners, and community members, we circulated a call for papers on climate change and knowledge translation, and received a robust and exciting response, including articles drawn from a wide range of regional case studies. We are delighted that the *Journal of Community Engagement and Scholarship* has been our partner on this exciting initiative.

The articles in this special issue include manuscripts, research from the field, community perspectives, student voices papers, and a book review section.

In this issue, Bryce Gunson, Brenda L. Murphy, and Laura Jayne Brown consider the impact of youth education interventions on attitudes and responses to climate change. Their focus is on maple syrup, and in particular, how high school students in Ontario, Canada, can

become involved in citizen science by taking part in educational programs that measure the impact of climate change on sugar maple forests. Called Climate Change S.O.S.—Save Our Syrup!, the outdoor education program saw students measure tree health, learn about biodiversity, and reflect on how consumer spending can support local food production. The results from the project indicate that after taking part in the maple syrup outdoor and in-class activities, students' knowledge of the impacts of climate change measurably improved. In their conclusion, the authors suggest that an emotional connection with nature through place-based outdoor education programs can alter how students understand the impacts of climate change in their communities.

In their paper, Krista Hiser and Matthew K. Lynch set out to understand the full picture around climate change education for a particular multi-campus institution: what do typical college students actually know, think, feel, and do about climate change? Through focus groups with students, they found: low levels of climate change literacy and self-confidence therein, that student perceptions depend mainly on their lived experiences, and a complex set of mixed emotions around climate change. Recommendations are rooted in cognitive “resonance”—the idea that simple actions, behaviors, or examples can be motivating and align with learning. For example, faculty can de-center their own expertise and invite student perspectives, administrators can support combined and experiential learning opportunities, and campuses can model climate-friendly behaviors.

Drew Bush, Victoria Slonosky, Geoffrey Pearce, and Renee Sieber explore the outcomes and benefits of student engagement in a citizen cyberscience project to transcribe historical weather documents (i.e., which cannot be read by machines) from an observatory. Participants were tasked with transcribing weather data, collecting narrative accounts from the same time period (e.g., microfiche, newspapers, books, photos), and synthesizing the former with the latter in a group research assignment. The researchers assessed the degree of knowledge translation by examining video recordings, the assignments, written reflections, and exit interviews. Although knowledge translation appeared to take place through student engagement with community history, it suffered from the challenges of archival research, which suggests that pursuing knowledge

translation through citizen science requires contextualization (e.g., through FAQs, tutorials, and blogs).

In the context of climate change and biodiversity loss, Ann Dale, Jaime Clifton-Ross, Francois Jost, Jaigris Hodson, Hilary Leighton, and Mary Bernard seek to establish a practice of research “curation”—a knowledge mobilization strategy that combines museum engagement strategies, social media tactics, communicating science through art, and social learning processes. They completed several research projects (e.g., surveys and social media testing) to suggest potential best practices for this pursuit, and then implemented those practices in three additional projects: a sustainability-themed social media account, virtual panel discussions on biodiversity, and a text and visual art exhibit on sustainable development. Besides the original 10 best practices, their main resulting findings for knowledge mobilization focus on diverse and younger audiences, researching the audience itself, and the appeal of integrating art with science.

In research from the field, Abdul-Rahim Abdulai, Vincent Chireh, and Roza Tchoukaleyska consider the use of community radio as part of a climate change symposium in Gros Morne National Park, Canada. They highlight the importance and opportunity to use radio, especially in rural areas, to disseminate knowledge and engage audiences. Community radio has a strong history in facilitating dialogue, is widely accessible and remains a relevant knowledge mobilization tool in an era with increasing digital media platforms. By facilitating community building, engagement with experts and knowledge holders, as well as deliberation on key issues, community compliments other efforts to build resilience to climate change. Furthermore, it provides a unique opportunity for people to engage remotely, when travel may otherwise prohibit involvement. This is highlighted as particularly valuable, and its importance has become increasingly apparent through impacts linked to the global coronavirus pandemic.

In their paper, Holly Clermont, Ann Dale, Leslie King, and Maureen Reed investigate two contentious energy projects. They explore how science is defined, understood, and used, and whether it plays a decisive or unifying role in energy development and environmental protection. They reveal how decision-makers perceived science and scientists, discovered

and selected scientific information, assessed conflicting science, and weighed science with other forms of evidence and information in making decisions. Finding that the importance and credibility of scientific information was seen through various lenses of cultural cognition, they conclude that there is little opportunity for science-based decision-making devoid of values. These findings highlight the need to make explicit the values that are woven through scientific research, dissemination, and use.

In their community perspectives paper, Garrett Richards and Michael Long write about their experience responding to The Games for Change Climate Challenge, which called upon independent game developers to create and prototype games to educate players about climate change. An early-career climate change researcher (Richards) and independent game designer (Long) responded to the challenge, creating a narrative game entitled *Nimo's Butterflies*. Through the process the authors experienced both the value and the challenges of using gaming as an educational tool.

In the second community perspectives paper, Simon Jansen explores motivations and collaboration through the example of opposition to hydraulic fracturing in western Newfoundland. The case demonstrates how actions to combat climate change can occur without climate change as the motivation. Driven by drinking water concerns and economic threats to tourism and fishing, the end result was a clear demonstration of gaps in the current research and required next steps before fracking could be considered.

The final community perspective, by M. Samantha Peverill, demonstrates how the development of a learning coalition helped a group of municipalities overcome the gap between intention and action when it comes to climate change and energy. Members engaged in R&D (“rob and duplicate”) processes to learn from each other's successes and mitigate capacity challenges. This model's success is likely due to face-to-face interaction, informal forums, confidence building efforts, informed facilitation, and study tours; it may be applicable elsewhere in Canada.

Through a student voices contribution, Malequi Picazo writes about the “Facing Sustainability” project that saw 11 undergraduate students documenting community perspectives, insights, and wisdoms around sustainability. Connecting with community members, Picazo

used interviews to create a series of unique stories to share. Through this exercise, students explored the complex concept of sustainability, offering readers an accessible entry into the discussion.

The special issue concludes with four book reviews that examine recent publications on climate change. The book reviews section has an introduction by Liette Vasseur, where the work of the student reviewers is situated within the master's in sustainability science at Brock University, Canada.

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