

# Uncertain Action, Uncertain Impacts: Selecting Climate Change Scenarios for Adaptation Planning

Climate change projections provide valuable guidance for adaptation planning. However, their effective use requires consideration of uncertainty inherent in projections in the context of their particular vulnerabilities and tolerance for risk. Although this uncertainty has multiple sources, the primary means that relevant parties have to engage with uncertainty is by comparing climate scenarios. Deciding which scenarios warrant consideration is proving increasingly contentious; consequently, climate science communicators, service providers, and related government offices may face conflicting recommendations regarding scenario choices, shaping practices of climate risk assessment and (ultimately) adaptation actions. The panelists will delve into these challenges and concerns, while considering how climate scenarios have been designed, their value and limitations, and their potential to inform adaptation planning.

**Thursday, February 29, 2024**

**Register:** <https://bit.ly/3tCXw2z>

10am-11am PT

1pm-2pm ET

2pm-3pm AT

2:30pm-3:30pm NL



## Panelists

**Joe Daraio**, Associate Professor, P.Eng.,  
Memorial University of Newfoundland

**Sabine Dietz**, PHD, Executive Director,  
CLIMAtlantic

**Vanessa Schweizer**, Associate Professor,  
University of Waterloo

**Christian Seiler**, Assistant Professor,  
Queen's University

**Moderator: Joel Finnis**, Associate  
Professor, Memorial University of  
Newfoundland, Co-Lead CORC CoP



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# Panelists



Sabine Dietz, PhD (she/her)

Executive Director, CLIMAtlantic

Sabine holds a PhD in biology (UNB), an MÉE (UdeM), and a BA (Trent University). During her 30 + year career in the environmental sector, she has worked for Parks Canada as ecosystem scientist, in the private sector as a climate change adaptation consultant, and for government and non-government organizations on topics such as species at risk, ecosystem conservation, capacity building, and climate change adaptation. She served as a Town councilor in Sackville NB from 2021 to 2022, has volunteered with many non-government organizations locally and regionally, and is currently serving as chair of the Board of Directors of Nature Canada.



Christian Seiler

Assistant Professor, School of Environmental Studies, Arts and Sciences, Queen's University

My research explores the role of the land surface in the global climate system under current and future climate conditions. By combining numerical modelling and global earth observations, my work addresses questions that advance our ability to predict how the terrestrial carbon cycle will respond to increasing anthropogenic CO<sub>2</sub> emissions. Recent topics include model benchmarking, global sensitivity analysis, mechanisms of forest dieback, and the impact of climate model biases on simulated carbon dynamics. Much of this research supports the evaluation and development of the Canadian Earth System Model's land surface scheme.



## Joseph Daraio

Associate Professor, P.Eng, Department of Civil Engineering, Department of Geography (Cross-appointment), Memorial University of Newfoundland

Dr. Daraio earned his PhD in civil and environmental engineering-hydraulics at the University of Iowa in 2009. He received his bachelor's degree in forest and environmental biology from the SUNY, College of Environmental Science and Forestry (1991), and has masters' degrees in biology (1994), philosophy (1998) and environmental engineering (2002). His primary interests lie in the potential impacts of climate change on storm water infrastructure and interdisciplinary research that links hydrology, hydraulics and ecology. Prior to joining Memorial, he was an assistant professor of water resources engineering at Rowan University in New Jersey (2012-2015) where he worked on the potential impacts of climate change on local water resources. He also worked as a postdoctoral research scholar at North Carolina State University (contracted with the USGS in Reston, VA, 2010-2012), where he developed models to simulate the effects of land-use change and climate change on watershed hydrology and instream temperature to assess potential long-term effects on aquatic organisms. Joe has made significant contributions through his research in hydro-ecology and eco-hydraulics including model development, methodology, and how to use and integrate hydrodynamic and hydraulic models with biological models. He also worked as a hydraulic engineer on river restoration and dam removal projects with the US Bureau of Reclamation from 2002-2004.

Joe has also published work on climate change impacts using hydrologic simulations to assess potential response of stream flow, storm water related infrastructure, and is developing new methods with which to incorporate climate change uncertainty into infrastructure design. His current work is focused on climate change adaptation and decision-making with uncertainty at the municipal and community levels. This requires a broader approach that integrates engineering with socio-environmental factors to better understand how local knowledge can be included in infrastructure planning and design.



## Vanessa Schweizer

Associate Professor, Department of Knowledge Integration, University of Waterloo

Vanessa Schweizer is an Associate Professor in the Department of Knowledge Integration in the Faculty of Environment at the University of Waterloo. She is a former Director of the Waterloo Institute for Complexity and Innovation and member of the Waterloo Climate Institute. Her research focuses on decision-making under uncertainty, namely the problem of near-term decision-making in the context of long-term consequences. She has considered this problem with respect to climate change and long-term technology planning. In these fields, scenarios are often used to make sense of complex and ‘slow-moving’ problems.

The anticipation of long-term consequences is difficult because history may not always be a helpful guide for future risks. Nevertheless, history powerfully shapes perceptions of what alternative futures are considered plausible, but such perceptions can be deceiving. Dr. Schweizer applies and develops novel methodologies for discovering internally consistent scenarios that can be surprising because they are not obvious or are difficult to imagine (so-called ‘black swans’ and ‘perfect storms’). Her primary motivation for this work is to ensure that policy discussions about environmental or social risks are not artificially constrained by either wishful thinking or lack of imagination.

Dr. Schweizer sits on the Steering Committee for the International Committee on New Integrated Climate Change Assessment Scenarios, which informs scenario development and its application in climate change research. She is also a member of the Global Young Academy, which recruits outstanding young scientists worldwide to lead international, interdisciplinary, and inter-generational initiatives to make global decision making more evidence-based and inclusive. Dr. Schweizer’s work on scenarios (with Elmar Kriegler) was recognized by Environmental Research Letters as one of the best papers of the year in 2012. She was also a Contributing Author to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Chapter 21: Regional Context of Working Group II: Impacts, Adaptation and Vulnerability, Vol. 2). She has previously held appointments with the US National Center for Atmospheric Research, the US National Energy Technology Laboratory, the Interdisciplinary Research Unit on Risk Governance and Sustainable Technology Development at the University of Stuttgart in Germany, and the Committee on the Human Dimensions of Global Change at the US National Research Council.