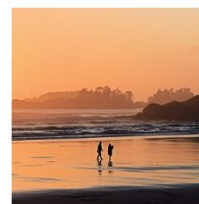


Climate Resilient Infrastructure & Buildings: One year later

January 2024—December 2024

Long-term outcomes for the Climate Resilient Infrastructure and Buildings research theme of the Western Academy for Advanced Research

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Contents

Successes at-a-glance 1

**Climate Resilient Infrastructure and Buildings: One Year Later (January 2024—
December 2024) 2**

1. Connecting communities to climate solutions 3

2. The Centre for Multi-Hazard Risk and Resilience & Canadian Severe Storms Lab 4

3. Music to move and empower us..... 5

4. Making the case for lasting change 7

Future Directions 8

Successes at-a-glance



**\$1.5M CAD +
\$498K GBP**
New Frontiers
in Research award



Centre for Multi-Hazard
Risk Reduction &
the Canadian Severe
Storms Lab



Music
for climate action



Alberta Climate-
Ready Homes
Program

Climate Resilient Infrastructure and Buildings: One Year Later (January 2024—December 2024)

Key highlights:

- New Frontiers in Research funding (\$1.5 M CAD, \$498,000 GBP) for the CIRCLE project and more
- The [Centre for Multi-hazard risk and resilience](#) and [Canadian Severe Storms Lab](#)
- Music for climate action
- Climate-resilience incentives with City of Calgary and City of Edmonton (ICLR)

Climate change poses a threat to our homes and infrastructure. Natural disasters have increased in frequency, and yet, stronger, more resilient, buildings are not being built. The [Climate Resilient Infrastructures and Buildings](#) (CRIB) research theme seeks to understand *why* some stakeholders have resisted solutions that could prevent loss of life and home, while also advocating for co-operation across all sectors.

A venue for research, collaboration, and exploration, the Western Academy for Advanced Research (WAFAR), has opened the door for critical advancements in climate resilience by offering CRIB members a chance to move their research into new directions. CRIB put leading Western researchers (Katsu Goda, Earth Sciences; Greg Kopp, Engineering) into conversation with industry experts (Paul Kovacs and Keith Porter, [Institute for Catastrophic Loss Reduction](#)) and experienced leaders in government and non-profit (Rebecca Denlinger, Province of British Columbia, [Ocean Networks Canada](#); Lucy Jones, [Dr. Lucy Jones Center for Science and Society, TEMPO](#)). WAFAR catalyzed this exchange of knowledge by providing financial and logistical support for two high-profile Visiting Fellowships (Denlinger, Jones) and by supporting [a symposia series](#)¹ that engaged stakeholders from academia, industry, and the public sector in a shared discussion about emotional barriers to climate resilience, disaster recovery and mitigation, building codes, and incentivization programs. As Theme Leader and ICLR Chief Engineer Keith Porter describes it, this multi-sectoral team offered “**an opportunity, almost**

¹ Held in January, May, and November 2023.

unique in my career, to purpose scholarly interdisciplinary research on climate adaptation with almost equal emphasis on knowledge creation and implementation.”

With these partnerships in place, CRIB succeeded in reaching new communities through innovative programming, whether it be through interactive learning centres or through concerts that inspire listeners to take action on climate change. Since finishing their official tenure at WAFAR in December 2023, CRIB has produced many impressive outcomes, including: 1.) A successful New Frontier in Research Fund application (\$1.5 M CAD, \$498,000 GBP), which has led to exciting new possibilities for community engagement (*see Section 1: Connecting Communities to Climate Solutions*); the establishment of the [Centre for Multi-Hazard Risk and Resilience](#) and the [Canadian Severe Storms Lab](#) (*see Section 2: The Centre for Multi-Hazard Risk and Resilience and the Canadian Severe Storms Lab*); the music for climate action project (*see Section 3: Music to Move and Empower Us*); a climate resilience incentivization program for the cities of Calgary and Edmonton (*see Section 4: Making the Case for Lasting Change*).

1. Connecting communities to climate solutions

Located within one hundred kilometers of the deadly Cascadia Subduction Zone, the coastal community of Tofino, British Columbia is one of Canada’s most vulnerable regions. The District of Tofino has responded to its heightened risk of earthquakes, tsunamis, and wildfires by implementing a state-of-the-art approach to disaster planning. In spite of this, the community still faces immense challenges.

Prior to joining the Climate Resilient Infrastructure and Buildings research theme, Western Fellow Katsu Goda, who has held the Canada Research Chair in Multi-Hazard Risk Assessment since 2018, was widely recognized for his work with seismic risk management in southwestern British Columbia. CRIB has helped Goda mobilize his research findings into solutions that will help communities prepare for, and recover from, devastating natural events. Crucially, CRIB has facilitated important partnerships that will advance Goda’s research to the next stage.

WAFAR-funded Visiting Fellow Rebecca Denlinger served as a critical entry point into Tofino’s settler and Indigenous communities. Throughout her extensive career, Denlinger has held leadership roles ranging from local to higher levels of government, including appointments with Georgia Homeland Security Task Force and the National Infrastructure Advisory Council by President George W. Bush, and most recently as Deputy Minister of Emergency Management for

the Province of British Columbia. Drawing upon her expertise in public service, as well as her insights into Vancouver Island’s diverse communities and cultures, Denlinger facilitated connections between Goda and key stakeholders like Elmer Frank, Chief of [Tla-o-qui-aht First Nation](#); Nyla Attiana, former CAO of the Tla-o-q-ui-aht First Nation and current CAO of the District of Tofino; and Hilary O’Reilly, Emergency Program Coordinator for the District of Tofino. These partnerships have led to a better understanding of how Tofino’s settler and Indigenous populations approach disaster resilience—and of the challenges they continue to face.

The CIRCLE project (Community and Infrastructure Resilience to Climate-geological Long-term effects) deepens this important connection *and* expands upon it. Founded by Goda and Reza Najafi (Western Engineering) in Spring 2024, and supported by [Western’s first international New Frontiers in Research Fund](#) (\$1.5M CAD, \$498,000 GBP), the CIRCLE Project promotes community-led solutions to disaster resilience in select coastal communities in Canada, Cuba, and Indonesia. One key area of focus is Tofino’s Indigenous communities. With support from community leaders, like Chief Elmer Frank and CAO Nyla Attiana, The CIRCLE Project is working with Tofino to create a model for disaster preparedness plan that includes the knowledge and experience of its community members.

Community projects are most impactful when they are shaped by the people who live there. CRIB helped to set the stage for the CIRCLE project by facilitating Goda’s close connections with the Tofino community, and it has also helped the project by providing a model for interdisciplinary research and collaboration that reaches beyond the university.

2. The Centre for Multi-Hazard Risk and Resilience & Canadian Severe Storms Lab

The Climate Resilient Infrastructure and Buildings research theme will continue to advance its work through two newly established centres at Western. The Centre for Multi Hazard Risk and Resilience harnesses Western’s strengths in flooding, wind, earthquake, and tsunami hazards to advance new solutions in disaster resilience and mitigation. Under the leadership of Western Fellow Katsu Goda and Reza Najafi (Western Engineering), the centre is home to the CIRCLE Project and is funded by Western’s first international New Frontiers in Research Fund (*see Section 1: Connecting communities to climate solutions*).

The Canadian Severe Storms Lab strives to transform how we understand severe weather in a changing climate. Founded by Western Fellow, and Northern Tornadoes Project Co-director, Greg Kopp, and supported by an investment from Impact WX (\$20M), the Canadian Severe Storms Lab draws upon, and will continue, CRIB's work with risk mitigation, building codes, and strategies for impactful science communication.

3. Music to move and empower us

The Climate Resilient Infrastructure and Buildings theme attracts bright minds to Western.

A leading seismologist, best-selling author (*The Big Ones: How Natural Disasters have Shaped Us*), and engaging media personality ([*Everybody's in LA*](#)), Visiting Fellow Lucy Jones believes that music can move us to take action. Jones led the theme's investigation into climate change's broader emotional and psychological impacts, exploring such questions as: How do emotions, like fear, anger, or despair, motivate us to change? How do they immobilize us? What role can art and music play in spurring meaningful changes for the individual and for society? WAFAR's culture of creative, friendly collaboration and cross-disciplinary exploration inspired Jones to push this line of thinking even further.

Drawing from her experience as a musician and as leader of [*Tempo: Music for Climate Action*](#), Jones led CRIB's effort to use music as a vehicle for scientific communication. This development has had a profound and lasting effect on CRIB's approach to outreach. In October 2023, Jones partnered with Sharon Wei (Western Music) and the Don Wright Faculty of Music to create the [*Music for Climate Action*](#) concert. The concert, and its accompanying activities, served as both an exhibit of CRIB's work with art, emotions, and climate action, and as a sort of living laboratory that provided opportunities for knowledge sharing and participant feedback and discussion.

Jones' collaboration with the Faculty of Music continued in March 2024, with [*Kaleidoscope of Creativity*](#), a multi-media symposium that showed how art and music can give voice to the changing climate. An ambitious undertaking, *Kaleidoscope of Creativity* brought public attention (*CBC News*, *CBC London Morning*, AM 980) to Western's community of artists and thinkers by showcasing Jones' music alongside original work from faculty and graduate students from the Faculty of Music, the Northern Tornadoes Project, the School for Advanced Studies in Arts and Humanities, and performances from guest musicians, including Grammy winner Yvonne Lam, JUNO winner Scott St. John, and cellists Mischa Meyer and Zachary Mowitz.

Springing from these events are dynamic new opportunities to create culture and foster community. *Kaleidoscope of Creativity* paved the way for an emerging partnership between the Faculty of Music and the Northern Tornadoes Project. In March 2025, Western's artist-in-residence, the New Orford String Quartet, will premier original new compositions inspired by the Northern Tornadoes Project. *Music for Climate Action* served as a model for Jones' latest climate action projects, including a collaboration [with the Colburn Baroque Ensemble](#) (November 8, 2024, Los Angeles), and [HomeCare: A Concert on Climate Change](#) (November 16, 2024, Caltech, Pasadena). Plans are underway to bring Jones back to Western for another collaboration with the Don Wright Faculty of Music in the 2025-2026 season.



*Sharon Wei,
Don Wright Faculty of Music
(Christopher Kindratsky/Western
Communications photo)*

Jones intends to share her findings about the intersections of art, emotion, and the psychology of climate change in a forthcoming book, tentatively titled, *The Safety Illusion*. *The Safety Illusion* expands upon a manuscript that Jones produced as part of her work with the theme, called *Fast and Slow Thinking about Climate Change*, and will introduce some of CRIB's ideas to a wide readership.



*Lucy Jones,
Visiting Fellow*

“I found this to be an extraordinarily enriching experience, looking at new problems, looking at old problems in a new way, and interacting with stimulating colleagues. It gave me time to think more deeply about the questions and dive into the interdisciplinary opportunities.”

4. Making the case for lasting change

The Institute for Catastrophic Loss Reduction (ICLR) is helping residents of Calgary and Edmonton protect their homes from extreme weather. The Alberta Climate-Ready Homes Program project aims to discover new and innovative ways to incentivize property owners to invest in improvements that could help houses withstand the effects of hail, heat, smoke, or basement flooding. As Theme Leader and ICLR Chief Engineer Keith Porter explains,



*Keith Porter,
Theme Leader*

“Existing incentive programs tend to offer only money from a single source such as the municipality. These new incentives differ in that they will offer money, information, or encouragement from multiple co-beneficiaries: cities, insurers, finance, real estate agents, and possibly others. They also differ in that they engage both logic and emotion to promote resilience investment. We refer to this novel scheme as multilateral incentivization.”

The program draws upon ideas uncovered by the Climate Resilient Infrastructure and Buildings² theme about incentivization strategies and their relationship with the psychology of climate change, and how emotions—like anxiety, despair, or apathy—can influence the choices that homeowners make about climate resilience. These findings also underpin two new learning centres, called the ICLR Climate Resilience Centres, that have been established in London and Winnipeg. The centres promote climate adaptation by making adaptation measures meaningful for the visitor by engaging the mind *and* by sparking emotions. The displays are intended to inspire a sense of agency in its visitors, so they may feel empowered to bring about broader, societal-level changes.

² This initiative also draws from other ICLR projects such as 2022-2023 international project with the US National Institute of Building Sciences and the ICLR's ongoing bilateral incentivization efforts.

Future Directions

In 2025, the Climate Resilient Infrastructure and Building theme will continue to translate its work into real world solutions by prioritizing the following areas:

- Building upon their vital work with the Tla-oq-ui-aht community and municipal leaders to co-create, and implement, community-driven strategies and solutions that will better protect the District of Tofino, BC from natural disasters
- Mobilizing advancements in disaster recovery, risk detection and mitigation, and the psychology of climate change through the Centre for Multi-Hazard Risk and Resilience and the Canadian Severe Storms Lab
- Leveraging their partnership with the Institute for Catastrophic Loss Reduction to create cutting-edge climate resilience programming and outreach
- Continuing to inspire the public through media, artistic programming, and books (*The Safety Illusion*) that are designed to engage a broader audience

With the support of WAFAR, CRIB created an exciting new approach to climate resilience that will impact how future leaders, engineers, thinkers, artists, community members tackle this most critical topic. By bringing climate science into conversation with the arts and social sciences, CRIB has not only advanced meaningful solutions, but also a new way of looking at climate change and its effects on humanity.



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