

Flood Resilience Challenge Game Annual Report: May 01, 2023 – Apr 30, 2024

It's been a busy and fun year! Between May 1, 2023 to April 30, 2024, 307 people played the Flood Resilience Challenge (FRC) serious role-playing game¹ in 10 events. Since the FRC was initially developed in Fall 2019 by Dr. [Evalyna Bogdan](#) and [Heather Murdock](#) (hydretechnical engineer and Ph.D. student at University of Potsdam), double that number (or 614) have participated in 27 FRC games that were in-person or online. Participants included a range of public and private stakeholders and students. The FRC game has been further refined with the help of the [FRC team](#). Recent developments include: 1. Revised and stabilized Web App for the online version; 2. Simplified and relaunched the in-person version; and 3. Trained FRC facilitators to meet the rising demand for the game; and 4. Developed [Expression of Interest sign-up](#).

**Thank you for having participated and/or provided support to make
the FRC game a success!**



Flood Resilience Challenge Serious Game



PURPOSE: To build the capacity of stakeholders to improve flood resilience and enhance flood risk governance, including collective decision-making.

The FRC game achieves this purpose, as an educational and engagement tool, by:

- Increasing flood literacy
- Fostering social learning
- Creating a safe space for exploring both risk management and communication strategies.

600+ players (in-person and online versions of the game) from across Canada between Fall 2019– May 2024 from universities, community members, NGOs, governments, and private sector.



SSHRC CRSH



FRC by the numbers

- 300+ players between May 1, 2023 to April 30, 2024 in 10 FRC games
- 600+ players between Fall 2019 to May 2024 in 27 FRC games
- 7 funders (in-kind and monetary)
- 2 FRC facilitator trainings

¹ Serious games are designed for education rather than just entertainment.

Collaborations with Universities

In 2023, Dr. Bogdan began working with Dr. Ali Asgary, the Director of York CIFAL. The *Centre International de Formation des Autorités et Leaders (CIFAL)* at York University is one of the 22 UNITAR's global network of training centres focusing on knowledge-sharing, training, and capacity-building for public and private leaders, local authorities, and civil society. Partnering with York CIFAL has resulted in the following:

- Developing and launching a CIFAL webpage featuring the FRC Game: [Flood Resilience Challenge \(FRC\) Serious Game - CIFAL \(yorku.ca\)](#)
- Developing and launching a CIFAL Expression of Interest website for the Flood Resilience Challenge serious game. Interested stakeholders can now access information or request an online or in-person FRC event for their organizations, institutions or communities. [Flood Resilience Challenge \(FRC\) Game Expression of Interest - CIFAL \(yorku.ca\)](#)
- Increasing opportunities and creating networks for international participants, research, and grants.

We are also working with the **York Emergency Mitigation, Engagement, Response, and Governance Institute (Y-EMERGE)** at York University which is an Organized Research Unit focused on disaster-related topics. Dr. Bogdan is the lead for the [Early Career Network](#) at Y-EMERGE to provide training and mentorship opportunities for postdoctoral fellows, graduate and undergraduate students.

The FRC game is excited to be collaborating with other universities on research projects:

- 2023 – 2026, SSHRC Partnership Development Grant ([flood risk & new housing](#)), PI: Dr. Ruth McKay, Carleton University
- 2022 – 2025, SSHRC Insight Grant ([enhancing water resilience](#)), PI: Dr. Julia Baird, Brock University

The Brock University project includes research by Zaara Momin, Masters student, examining the effect of the FRC game on enhancing empathy, including for increasing water resilience.

We are also grateful to the generous funders who have supported the FRC game and the team since 2019, including York University Faculty of Liberal Arts & Professional Studies, University of Waterloo, MEOPAR, and SSHRC Tri-Council.

“I love the way the game was designed in terms of it being an educational tool. I learned a lot from it and it was a lot of fun. It had a lot of interaction...applied to the real world...took a lot into consideration.”

“...it was effective because the game forces the player to critically think about flood resilience and collaboration in real time.”

FRC Serious Game as an Educational and Engagement Tool in Academic Courses

Experiential learning provides hands-on tasks and opportunities to do and learn from mistakes. Experiential learning enhances creativity and innovation, creates real-world relevance, and provides opportunities for reflection, and accelerates learning.

At York University (YU), 118 students participated in the (in-person) FRC game in the following courses taught by Dr. Evalyna Bogdan:

- DEMS 1701 - Disasters: Case Studies of Causes and Impact
- DEMS 2700 - Fundamentals of Emergency Management
- DEMS 3706 - Disasters & Humans

Brock University hosted 2 FRC Games (in-person) in the following courses with 37 participants:

- GEOG / TOUR 4P83: Research Themes in Water Resources (taught by Dr. Julia Baird)
- ENSU 3P92: Environmental Psychology (taught by Dr. Gillian Dale)

“Some things require a textbook; but I feel like this information is perfectly suited to the game’s format.”

A total of 155 students played the FRC game during this reporting period.

FRC Game: Now In-person Version Available

The revised in-person version of the FRC game was piloted in October 2023 during the FRC facilitator training. The revisions include simplifying the game, enhancing stakeholder interactions, and improved graphic design. The majority of facilitators were undergraduate and graduate students from York University and University of Waterloo.



“Visually seeing things made it easier to understand.”

“...this type of game...is what we need much more of if we are going to tackle the climate crisis...relating to each other using our creativity and problem-solving skills.”

Facilitator Trainings

During this period, a total of 33 participants were trained to be FRC facilitators. The October training prepared facilitators for the FRC game in Cambridge with the business district.

October 2023: Waterloo School of Architecture, Cambridge, ON - 15 (incl. training for both online & in-person delivery)

January 2024: York University, ON - 18 participants (in-person game delivery)



The next facilitator training will be in Fall 2024. If you are interested, please e-mail ebogdan@yorku.ca.

Thank-you to the team of people at University of Waterloo who made the FRC training event possible:

1. [Partners for Action \(P4A\) at the University of Waterloo](#), committed to advancing flood resiliency in Canadian communities, led by Director Sharmalene Mendis-Millard. P4A organized the event and venue, invited partners, and managed all communications.
2. Funding from the Waterloo Climate Institute's [TRANSFORM Cities project](#) led by Dr. Sarah Burch brought P4A and Dr. Evalyna Bogdan together to brainstorm the Flood Resilience Challenge Cambridge (FRC2) event.

Stakeholder Events

The FRC serious game, as an educational and engagement tool, provided an opportunity to build understandings, relationships and networks. During this reporting period, three stakeholder events were held: Cambridge, Ontario (in-person), Country of Suriname (online), and NFRF-I grant team members (online).

“The game is a good platform which introduces the concept of governance effectively to a lay person.”

Cambridge Business Association

Downtown Galt, Cambridge, Ontario experienced severe flooding in spring 1974. In anticipation of the upcoming 50-year anniversary of the flood, 22 participants from businesses, governments, and NGOs from the downtown area gathered in the historic Gaslight District to participate (in-person) in the FRC Cambridge (FRC2) game. The beautiful [Tapestry Hall](#) served as the venue for the event. Cambridge [City Councillor Sheri Roberts](#) shared about her experience at FRC2 in Instagram.

Instagram

Log In Sign Up



sheri_roberts_ward5 • Follow
Tapestry Hall

sheri_roberts_ward5 Tonight I participated in a fascinating "serious game" that simulated flood resilience planning. We were all given various roles (I was a farmer!) of stakeholders in the community and the three levels of government as well as media. It was a very interesting experience and the improvement in our collaboration was impressive after just 3 rounds. Thank you to the organizers, sponsors and everyone who participated.
@partners4action #floodresilience #cambridge #cbridge

You can read about the FRC2 game event in this Storybook <https://arcgis.com/1y9Sm4>

ArcGIS StoryMaps

When the flood came: The Great... Flood Resilience Challenge Purpose and Goals of FRC Game **Playing the FRC Game in Galt, ...** Cambridge Flood Susceptibility... Land Acknowl...

community came together in the face of the daunting flood hazard, working to enhance resiliency and to reduce disaster risks and damage. At the end of the game, players debriefed about their strategies and experiences, providing further opportunities for learning.

Some of the learnings that were applicable to the real-world was the development of increased flood literacy of various flood types and mitigation measures among players. Participants better understood diversity and inequity. They experienced conflict and collaboration, explored tensions, and found common ground.

We are grateful to the people and organizations who made the FRC Cambridge (FRC2) event possible:



A special thank you to Brian Kennedy of the Cambridge BIA



Country of Suriname

The [Climate Risk Institute \(CRI\)](#) provided a course on coastal management resilience for the country of Suriname. There were 34 online attendees for the FRC game (20 played), including CRI staff and individuals from government and other public entities.



Image source: [Suriname Maps & Facts - World Atlas](#)

“Loved this approach to learning! . . . Observed some feelings of contention and disappointment. Also observed agreeance and success! I think as this was a stakeholder role playing game, it was easier to comprehend thoughts/feelings as people weren't worried about actually offending anyone.”

“The exercise was a real-life example. . . It was a tool to simulate the decision-making process.”

NFRF-I Grant Proposal International Team

In summer 2023, Dr. Evalyna Bogdan led the development of a grant proposal for the New Frontiers Research Fund International (NFRF-I) fund. The proposal's aim was to incorporate the FRC game with [social vulnerability flood mapping](#) with Dr. Liton Chakraborty and [virtual reality \(VR\)](#) with Dr. Mojgan Jadidi.

The project involved co-investigators, co-applicants, and collaborators from Bangladesh, Canada, Germany, Norway, and Vietnam. The population of focus was vulnerable groups. Unfortunately, the proposal was not successful. However, we will apply again for funding in the near future.

16 of the 23 NFRF-I proposal development team played the online FRC game to provide them with context, increase their interest, and to demonstrate the game's effectiveness.

“The game highlights so well how those with a larger budget or with a larger voice are able to influence other stakeholders and governments to benefit their own needs more.”

Publications

There are several publications on the FRC game. Research on the FRC game uses several methods: pre- and post-game surveys, observations, and a debrief to gather learnings and insights. More publications are also currently underway.

- 2022 Bogdan, E. A., & Cottar, S. A serious role-playing game as a pedagogical innovation to strengthen flood resilience. *IEEE Technology and Society Magazine* 41(3), 98-100. [10.1109/MTS.2022.3197124](https://doi.org/10.1109/MTS.2022.3197124). (open access)
- 2024 Bogdan, E.A., Ibrahim, N., Murdock, H. J. The Flood Resilience Challenge serious role-playing game as an online teaching and learning tool in a large engineering class. *Conference Proceedings 2023 Canadian Engineering Association, Paper 165*. (open access)
- 2024 Bogdan, E. A., Murdock, H. J., Ibrahim, N. The Flood Resilience Challenge serious game to teach complex socio-environmental issues in engineering: Extended abstract. *Conference Proceedings for the American Society for Engineering Education (ASEE) STL Section. ASEE PEER* (open access - publication available soon)

If you would like to play your way to preparedness with the Flood Resilience Challenge serious role-playing game, please follow this link:

[Flood Resilience Challenge \(FRC\) Game Expression of Interest - CIFAL \(yorku.ca\)](https://www.yorku.ca/cifal/frc)

Thank you again and please visit frcgame.com for updates.

