

# Voice of the River

Promoting the dynamic of the edge conditions of the Ottawa River,  
the Valley of the *Kiji Sibi* through floating islands

by Hamidreza Aghashahi

A thesis submitted to the Faculty of Graduate and Postdoctoral Affairs  
in partial fulfillment of the requirements for the degree of

Masters of Architecture

in

Azrieli School of Architecture & Urbanism

Carleton University  
Ottawa, Ontario

© 2018 - 2019  
Hamidreza Aghashahi

Individually, we are one drop.  
Together, we are an Ocean.

Ryunosuke Sataro





## **Thesis Abstract**

### Voice of the River

The Ottawa river, the Valley of the *Kiji Sibi*, also known as Great River, is the eighth largest and one of the most important rivers in Canada. However, there are complex problems that have developed in relation with the river, such as water quality, sewage overflows and nuclear waste run off, dams' effects on the fish species, river access, river banks and regional boundaries.

The purpose of this thesis is to explore the potential to reconnect the two edge conditions which belong to different regional boundaries along the Ottawa River and its linkage points through floating islands. The intention is to consider ways to re-imagine our riverfront for future generations by raising awareness about the important qualities of water and its psychological values in our lives.

The latter may be identified as one of the most important areas to investigate, as it has repercussions on all others in terms of the management and resolution of issues that go beyond fictional geographic regional boundaries. It is argued here that the river is about many sides, past two physical river banks. There are many cultural, political and economic issues intersecting, each bringing different points of view to the fore.

The goal of this thesis is to question the historical continuity and the possible changes of the elements associated with the Ottawa River with the aim to rethink its importance over the next few decades to accommodate future fluid and vibrant communities. One of the central design strategies for this thesis is the idea of Floating Islands, that aim to become a new element of the Ottawa river watershed. The floating islands are a series of accessible fluid movable and flexible structures that promote diversity, education and most importantly interaction. Throughout the history of the Ottawa river, bridging between two geological sides had been always done with vessels like canoes and wood rafts. This made the Ottawa river an important highway for transportation, for first nations and then later the European settlers. Referring to this history and being inspired by it, the notion of floating islands reflects the importance of temporary architecture to create dialogue between people, inviting them to the river, to develop an educational approach that will be part of the engagement and interaction. The idea of crossing borders through any theoretical and physical obstacles is to providing opportunities for humans and animals to travel to all parts of the river, especially to certain nodes along the edge where access has been denied in the past, in order to open up an opportunity for people to understand the Ottawa River Watershed better in order to protect it for our future generations.

## **Acknowledgments**

Voice of the River

First and always I thank God for all the entire universe, blessings, opportunities, givings and not givings, and the fact that without God, nothing would be possible.

Special thanks to my parents, older siblings and friends for supporting me through my academic journey. I appreciate your prayers, guidance and love.

Special thanks to Professor Bruce Hinds, Professor Doreen, Professor Coleen Reid, and Professor Mark Tholen, from OCAD University for believing me as a future architect. You are always in my mind.

Thank you Plus Farm, II BY IV DESIGN and Riken Yamamoto & Field Shop, for giving opportunities to test my skills in professional world in order to realize my capabilities for my future career.

Thank you Dr. Catherine Bonier and Professor Johan Voordouw for having initial impacts on my graduate studies. I learned a lot from you two.

Thank you, Director Jill Stoner, for caring about all of us and providing precious support towards the future of our school.

Special thanks to Dr. Ozayr Saloojee and Dr. Shaun Murray for all the inspirations and critical feedbacks on my long running passion for water and fluid cities.

Special thanks to Douglas Cardinal, the late William Commanda, Elder Verna McGregor and Riverkeepers for bringing awareness towards the Ottawa River.

Thank you to all my visiting critics that guided us throughout this journey and to Professor Roger Connah for great motivations.

To my academic advisor, Dr. Federica Goffi, thank you for your encouragement and continuous support in the production of this research. You have been a valuable inspiration through my past years at this school, I have learned a lot from you. Much respect to you for your patience and positive guidance towards me and my colleagues.

## Table of **Contents**

Voice of the River

Introduction	Page 1
A Journey Along the Ottawa River	Page 7
What is the Edge Conditions	Page 13
Cities in relationship to water	Page 21
History of the Ottawa River	Page 26
Importance of the Ottawa River and The Forces that impact its future	Page 31
Inhabitants and Communities	Page 44
The Sites	Page 45
Concept & The Proposal	Page 52
River Transformations	Page 61
The Floating Islands	Page 73
Conclusion / Postscript	Page 111
Project Panels	Page 116
Appendix A: What is a River	Page 123
Appendix B: What is Watershed	Page 124
Appendix C: Who are the Riverkeepers	Page 126
Bibliography	Page 127

## List of *Illustrations*

### Voice of the River

**Fig 1.0** The Ottawa River Photomontage. Drawing by author.

**Fig 2.0** The Ottawa river's edge documentation near the Canal on Ottawa side. Photography by author. September 2018.

**Fig 2.1** A view from water showing the a cluster of floating islands facing Bate Island. Drawing by author.

**Fig 2.2** Documenting the river's edge looking north towards Hull and east towards Alexandra Bridge. Photographs taken by author. September 2018.

**Fig 2.3** "Lake Capimitchigama: Headwaters or origin of the Ottawa River. " Photography by Max Finkelstein. Published on Ottawa Riverkeeper's Map Gallery: "A Journey along the Ottawa River".

**Fig 2.4** "Lac Temiscaming: Wedged between steep cliffs up to 70 m high, forms the border between Quebec and Ontario."Photography by Meredith Brown. Published on Ottawa Riverkeeper's Map Gallery: "A Journey along the Ottawa River".

**Fig 2.5** "Opemican: An historic log floating operation centre. Steamboats, used to haul log booms, ferry cargo and passengers were repaired and stored for the winter at Opemican." Photography by Meredith Brown. Published on Ottawa Riverkeeper's Map Gallery: "A Journey along the Ottawa River".

**Fig 2.6** "Upper Ottawa River: One of the few sandy beaches between Ville Marie and Mattawa" This indicates the opportunities for the floating islands near these beaches. Photography by Mike Beedell. Published on Ottawa Riverkeeper's Map Gallery: "A Journey along the Ottawa River".

**Fig 2.7** Otto Holden Dam: one of 19 major dams to get around when traveling the entire 1,272 km of the Ottawa River. Photography by Max Finkelstein

**Fig 2.8** Chalk River: Nuclear Laboratories along the Ottawa River. Photography by Meredith Brown

**Fig 2.9** Oiseau Rock: 150 foot high rock is a sacred site for First Nations Peoples who left behind an amazing ancient pictographs. Photography by Meredith Brown

**Fig 2.10** Rock Art: Creations each summer by John Ceprano at the tail of Remic Rapids. Photography by Author

**Fig 2.11** The Prince of Wales Bridge: Rail bridge across Ontario and Quebec, first opened 1880 and closed 2005. Photography by Author

**Fig 2.12** Ottawa's Lemieux Island water purification plant. Photography by Rob Huntley.

**Fig 2.13** Chaudiere Falls/Dam, Chaudiere Island and Victoria Island. Also Three bridges (Chaudiere Bridge/Eddy st, Portage Bridge and Alexandra Bridge.) Photography by aerialphotographs.ca

**Fig 2.14** Ottawa River Pathway/Trans Canada Trail. Photography by Author

**Fig 2.15 - 2.22** Exploring the edge of the Ottawa River through a drawing by author.

**Fig 3.0** Drawings showing William Commanda's Vision for Asinabka.

Source: <http://www.asinabka.com>

**Fig 3.1** Dougals Cardinal Proposal: Asinabka Cultural Centre

**Fig 4.0** Falls Near Ottawa River, Canada From Ballou's Pictorial Drawing-Room Companion, February 14, 1877. Drawn by Mr. Kummer, engraved by John Andrew. Ottawa, A Pictorial Record (1807-1882) DEV-SCO Publications LTD.

**Fig 4.1** Bird's Eye View of Ottawa River As part of Panoramic Exhibition Maps (1865-1905) Public Archives Canada

**Fig 5.0** Hand Drawing of Large portion of The Ottawa River (from Fort-Coulonge to Hawkesbury). Drawing by author.

**Fig 5.1** Re-imaging edge conditions of the river. Drawing by author.

**Fig 5.2** Regional Map. Drawing by author.

**Fig 5.3** The diagram of the cycle, writes Robert E. Horton, is intended "to show the principal steps involved in the hydrologic cycle in the most typical case, that of a drainage-basin tributary to the ocean."

**Fig 5.4** Edge Conditions (Accessibility Through Motion). Drawing by author.

**Fig 5.5** Pollution Nodes and Remediation Actions. Drawing by author.

**Fig 5.6** Wunderland Kalkar Bird Eye view. Kalkar, Germany. Photo by Groupon

**Fig 5.7** Wunderland Kalkar Bird Eye view. Kalkar, Germany. Photo by Herald

**Fig 5.8** Shifting Territories. Drawing by author.

**Fig 5.9** May 10: A flooded street in Gatineau, Que. By the flood's end, some 5,371 homes in the province of Quebec were flooded. The Globe and Mail.

**Fig 5.10** Land Use. Drawing By Author.

**Fig 5.11** Map of The Floating Islands. Ottawa River. Drawing by author.

**Fig. 6.0** Portion of the Prince of Wales Bridge. Photomontage using Drone Documentation by Moe Cote on YouTube.

**Fig. 6.1** The Prince of Wales Bridge. Photo by Author

**Fig. 6.2** Path along the Ottawa River. Photo by Author

**Fig. 6.3** View facing East from Champlain Bridge. Photo by Author

**Fig. 6.4** View facing East towards the island. Photo by Author

**Fig. 6.5** View facing North Towards the island. Photo by Author

**Fig 7.0** Flow concept model. Mix media and photo by Author

**Fig 7.1** Bangladesh Floating Gardens. Photography by Practical Action.

**Fig 7.2A** The Floating Islands. Drawing by author.

**Fig 7.2B** The Floating Islands. Drawing by author.

**Fig 7.2C** The Floating Islands. Drawing by author.

**Fig 7.3** The sunset time by the river. Photo by Author

**Fig 7.4** Details of the model. A collaborative project by Hamid Aghashahi, Andrea Tamayo Bernal, and Shannon Clark. Photography by author.

**Fig 7.5** Illuminating the model. A collaborative project by Hamid Aghashahi, Andrea Tamayo Bernal, and Shannon Clark. Photography by author.

**Fig 7.6** Illuminating the model to get an essence of sunset or sunrise. A collaborative project by Hamid Aghashahi, Andrea Tamayo Bernal, and Shannon Clark. Photography by author.

**Fig 8.0** Diagrams of Floating Gardens. By Practical Action

**Fig 8.1** Indigenous members harvesting. Photo by Native Art in Canada

**Fig 8.2** Indigenous members harvest wild rice by hand from canoes each fall. Photo by Indian Country Today

**Fig 8.3** A floating platform in Skadar Lake entices pelicans to build their nests here, protecting them from floods. Photo by *Smithsonian*

**Fig 8.4** Heron family on a floating raft. Photo by Chinadailey

**Fig 8.5** *Living in Water* proposal by Adjaye Associates. Photo by chiriverlab

**Fig 8.6** *Floating garden island*. Photo by moss:architecture:design:green

**Fig 8.4** Heron family on a floating raft . Photo by Chinadailey

**Fig 8.5** *Living in Water* proposal by Adjaye Associates. Photo by chiriverlab

**Fig 8.6** *Floating garden island*. Photo by moss:architecture:design:green

**Fig 8.7** *Floating garden island*. Photo by moss:architecture:design:green

**Fig 8.8** *Floating Theater of the World*. Photo by Palladio Museum

**Fig 8.9** Aldo Rossi, *Theater of the World*, 1979. image courtesy of *La Biennale di Venezia*

**Fig 8.10** Map of Nodes.Ottawa River. Drawing by author.

**Fig 8.11** *The Floating Piers*. Photo by DIVISARE

**Fig 8.12** *The Floating Piers*. Photo by Wolfgang Volz © 2016 Christo

**Fig. 8.13** The pier that connects Giudecca with Venice during the Festa del Redentore in July 2009. Photo by Aisano

**Fig. 8.14** "From the pontoon bridge during Festa del Redentore (2006)" Photo by Creative Commons

**Fig 9.0** *Imagining The Floating Island*. Mixed Media by Author

**Fig 9.1** *Imagining different modes for The Floating Island*. Model and Photo by Author

**Fig 9.2** *Imagining different modes of The Floating Island*. Drawing by Author

**Fig 9.3** *Imagining The Floating Island*. Drawing by Author

**Fig 9.4** *Imagining The Floating Island* with a concept of roof. Model and photo by Author

**Fig 9.5** *Imagining The Floating Island* through explorations of series of roofs based on circular bases. Drawing by Author

**Fig 9.6** *Imagining The Floating Island* through explorations of series of roofs based on circular forms. Drawing by Author

**Fig 9.7** *The Floating Island Process*. Model by Author

**Fig 9.8** *The Floating Island Process*. Model by Author

**Fig 9.9** *The Floating Island Process Models* by Author

**Fig 9.10** *The Floating Island Process Models* by Author

**Fig 9.11** Map of The Floating Islands. Ottawa River. Drawing by Author

**Fig 9.12** Movement of the Floating Islands along the Ottawa River. Drawing by author.

**Fig 9.13** Exploded Axonometric View of A Floating Islands. Drawing by Author

**Fig 9.14 & Fig 9.15** Bamboo Weaving Houses. Ethiopia. Photo by Nomads.org

**Fig 9.16** The Mannheim Multihalle was designed by Frei Otto and Architects Carlfried Mutschler and Winfried Langner. Photo by Inhabitat

**Fig 9.17** The Centre for Native Child & Family Well Being in Toronto. Two Row Architect served as the Indigenous advisor to LGA Architectural Partners during the project. Photo by Ben Rahn/A-Frame

**Fig 9.18 & Fig 9.19** Centre Pompidou-Metz by Shigeru Ban Architects. Photo by Didier Boy De Lu Tour

**Fig 9.20** Mashroom Surfboards. Courtesy of ecovative

**Fig 9.21 & Fig 9.22** Mashroom Surfboards. Courtesy of surf organic boards

**Fig 9.23** Existing Edge Condition near Parliament Hill. Photo by Author

**Fig 9.24** Existing Edge Condition near Parliament Hill. Photo by Author

**Fig 9.25** Physical Model 1/50 creating the existing of the Edge Condition near Parliament Hill with the floating island residing the edge. Photo by Author

**Fig 9.26** Physical Model 1/50 creating the existing of the Edge Condition near Parliament Hill with the floating island residing the edge. Photo by Author

**Fig 9.27** A view of a Floating Island along the edge of **Node #5**. Drawing by Author

**Fig 9.28** A view of a Floating Island along the edge of the Ottawa River. Drawing by Author

**Fig 9.29** A view of a Floating Island along the edge of Canadian Museum of History. Drawing by author.

**Fig 9.30** The idea of flow along the river with different conditions is that the floating island is capable to transform and adopt to different dynamic edge conditions. Conceptual Drawing by author

**Fig 9.31** A bird's eye view of a Floating Island along the Ottawa River. Drawing by Author

**Fig 9.32** Potential plants to be grown on a floating island. Drawing by Author

**Fig 9.33** A view of a Floating Island's ceiling and how effects of panels. Drawing by Author

**Fig 9.34** A view of a Floating Island from under water. Drawing by Author

**Fig 9.35** Activities of fish species under a reed boat from "LOST ON THE ATLANTIC" documentary film (40:48). This particular footage explains how these species interact with organic materials underwater moving objects.

**Fig 9.36** A great reference showing a diagrammatic study of under water of a floating Buoyant Structures and the capabilities. Courtesy of Buoyant Ecologies Float Lab.

**Fig 9.37** Cross Section of the River (first half) showing different aggregation of the Floating Islands. Drawing by author.

**Fig 9.38** Cross Section of the River (second half) showing different aggregation of the Floating Islands. Drawing by author.

**Fig 9.39** A Detail Plan and Section of a floating island. Drawing by author.

**Fig 9.40** A view of a Floating Island from outside towards the interior of it. Drawing by Author

**Fig 9.41** *The Floating Islands Conceptual Process*. Model by Author

**Fig 9.42** *Imagining The Floating Islands* through explorations of spatial architecture design . Drawing by Author

**Fig 9.43** Cluster aggregation of the floating islands. Drawing by author.

**Fig 9.44** *Imagining series of modules coming together to form The Floating Islands as an entire network for a specific event*. Drawing by author.

**Fig 9.45** Imagining *The Floating Islands* through explorations spatial forms created by cluster of cubes coming together as an entire network. Drawing by Author

**Fig 9.46** Imagining the opportunities to habitat above and within the entire network. Drawing by Author

**Fig 9.47** Imagining *The Floating Islands* through explorations of spatial quality floating on water. Drawing by Author

**Fig 9.48** Imagining *The Floating Islands* through explorations of spatial quality floating on water. Drawing by Author

**Fig 9.49** A view from water showing the a cluster of floating islands. Drawing by Author

**Fig 9.50** A cluster of floating islands coming together in unity for a special event. Drawing by Author

**Fig 9.51** Plan of a cluster of floating islands coming together in unity for a special event. Drawing by Author

**Fig 9.52** A floating island being pulled by a riverkeeper's boat. Drawing by Author

**Fig 9.53** View from Victoria Island facing East towards Parliament Hill. This drawing by author is showing the relationship of an existing floating dock during May 2019. This opportunity offers people to board into the floating island easily.

**Fig 10.0** Riverkeeper's shoreline cleanup along the Ottawa River near Parc des Rapides-Deschênes. October 27, 2018. Photography by Matthew Brocklehurst.

**Table A.** The Ottawa River Photomontage. Drawing by author.

**Table B.** Relationship of a floating island with the edge of The Ottawa river. Drawing by author.

**Table C.** Land Use Map along the Ottawa River & Cross Section of the River (second half) showing different aggregation of the Floating Islands. Drawing by author.

**Table D.** Relationship of a floating island with the Ottawa river, humans and other species on the water Drawing by author.

**Table E.** Movement of the Floating Islands along the Ottawa River. Drawing by author.

**Table F.** Map of The Floating Islands. Ottawa River. Drawing by author.

**Table G.** View from Victoria Island facing East towards Parliament Hill. Drawing by author.

**Table H.** The cluster of floating islands along the archipelagos (Lumpy Denommee's Island & Merrill Island) of the Ottawa River. Photo-montage by author.

## Note from **Author**

Voice of the River

In recent years, especially after moving to Ottawa, I have developed a heightened awareness of nature and ecological habitats. I have become more aware of trees and parks, more aware of our relationships to them, and of course more aware of the element of water, which plays such a key role throughout the city.

As an immigrant to Canada, growing up in the high density and multicultural city of Toronto, I am aware that I have different viewpoints than the Native people, and especially the native communities that have grown up in different cultural lifestyles with different perspectives. Unfortunately through my studies in Canada, I never had an opportunity to get full exposure to aboriginal culture in order to understand it better. Therefore, I am not in a position to argue on behalf of them towards the lands and waters that have been occupied by early European settlers. However, I am inspired by key figures such as Douglas Cardinal and the late William Commonda and their vision towards the Ottawa River.

My thesis investigates the existing conditions with the desire to rethink and to bring more awareness towards the future of the Ottawa River for all people who live in its surroundings, no matter where they come from and what they believe in. Matter of fact, in respecting all cultures, I will do my best to present the argument equally from many view points, and include sources from all sides.

## Word **Usage**

### Voice of the River

This thesis uses words that convey my ideas through writing with the intent not to offend any culture or any member of a community or organization. The terminology being used in this thesis is used to display the viewpoint of the speaker and the time in which they are speaking.

Furthermore, I did my best throughout this research to respect the importance of the unwritten history of ingenious people prior to colonization of the Ottawa region and to activate the conversation about it.

Therefore, the wording reflects my personal individual perspective. I maintain full respect for the indigenous perspective on the future of the Ottawa river.

## Introduction

### Voice of the River

Through history, rivers have been an important part of human life. A river is a large, natural stream of flowing water, usually freshwater flowing towards an ocean, sea, lake or another river (**Appendix A**). In pre-historic times, humans settled along the river banks, where they found fish to eat and water for drinking, cooking, and bathing. Later, people learned that the fertile soil along rivers is good for growing crops.<sup>1</sup> As Dilip Da Cunha mentions in *The Invention of Rivers: Alexander's Eye and Ganga's Descent*, rivers are used from the colonial perspective as central figures to be "the spine of civilization".<sup>2</sup> He challenges this view and the notion that colonizer culture is civilization. In the case of the Ottawa river, this has been clear through centuries of interactions of native people with the land and rivers. In recent years, after colonization happened, a lot of activities took place along the Ottawa River, such as fur trade, industrial time, and contemporary development.

As time passes complex issues and dissonance run through the Ottawa river. In relation with the Ottawa river, it cannot be underestimated the importance of water quality, sewage overflows and nuclear waste run off from The Chalk River Laboratories, the dams' effects on the fish species such as American Eels, the river access, and the river banks and regional boundaries of Quebec and Ontario.

1 National Geographic. River.

2 Da Cunha 2018: 1. Dilip Da Cunha was invited as key note speaker for *The Fluid Infrastructure Symposium* held in March 2017. At Azrieli School of Architecture & Urbanism that was organized by Catherine Bonier and Ozayr Saloojee. I had an opportunity to attend the symposium, hear the keynote presentation and participate in the workshop led by Dilip Da Cunha.



**Fig 2.0** The Ottawa river's edge documentation near the Canal on Ottawa side. Photography by author. September 2018.

Both the Anishinaabe peoples and Ottawa Riverkeepers (**Appendix C**) believe in healing the river, and they use different methods to do that.

*“According to the Royal Proclamation of 1763, the Algonquin people are the rightful caretakers of the Asinabka site. Therefore, the Anishinaabe peoples have the right to let the land heal and keep it as parkland, a green place, and a place of ceremony if they wish it and for as long as they require.”<sup>3</sup>*

This means that it is important to allow the land and water the time to heal on their own. The Riverkeepers organization on the other end has been trying to bring awareness to water issues by inviting people to participate and engage with the river to clean and protect it and essentially contribute to the process that sustains the process of healing. However, most of the edge line of the Ottawa river within the greenbelt where there is a higher identification, is owned by National Capital Commission (NCC) where they “ensure that Canada’s Capital is a dynamic and inspiring source of pride for all Canadians”.<sup>4</sup> Currently they have two major projects that are in the early stage of planning called, “Ottawa River North Shore Parklands Plan” and “Ottawa River South Shore Riverfront Park Plan”, emphasizing the revitalization of the riverfront parks of the Ottawa river. Regardless of efforts, I argue that there are still fundamental gaps that need to be filled to protect the Ottawa river watershed, the inhabitants, such as animals, species and people, seeking for a fundamental unity between all sides. Therefore, this thesis believes in engaging and educating people about the Ottawa river as the most important steps for healing and protecting it for future generations.

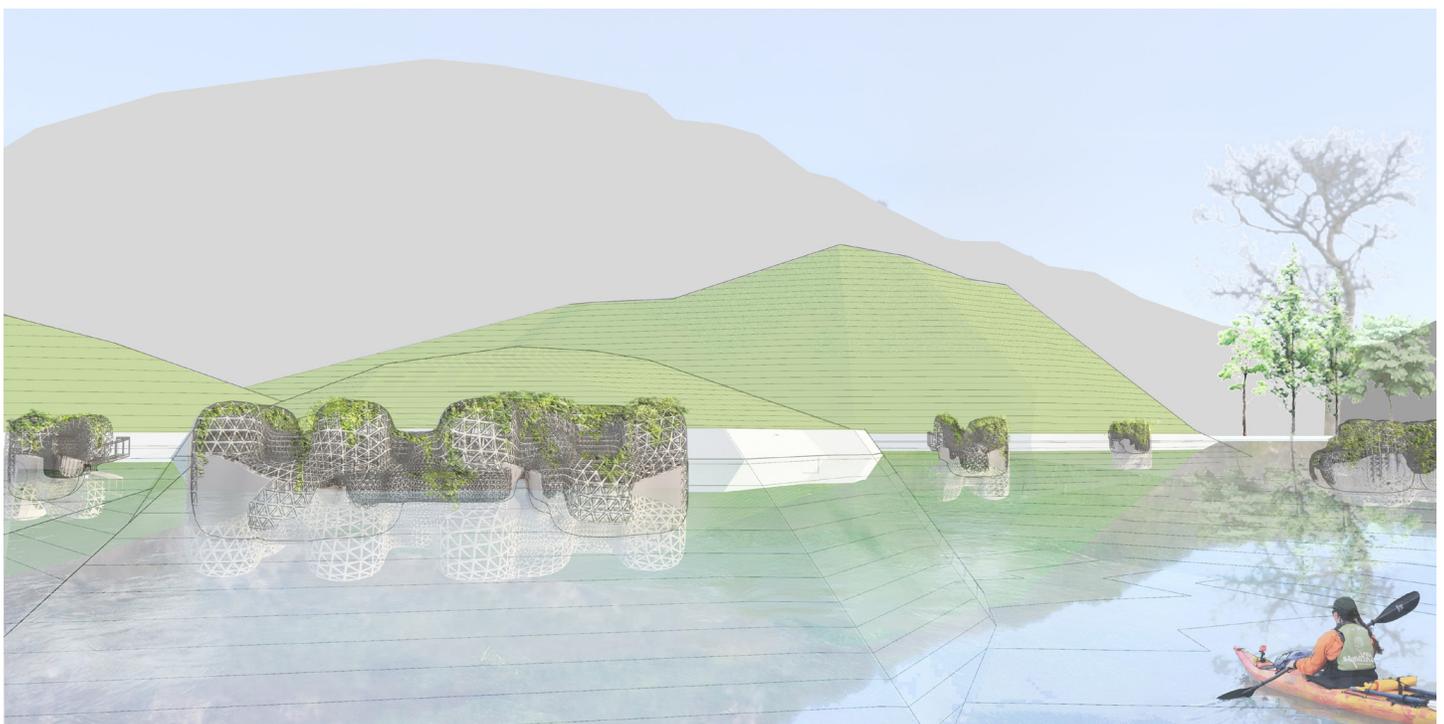
The focus of this thesis is on how architecture and water can bring communities together to learn more about the future of the Ottawa river watershed (**Appendix B**), our fluid cities and related issues. This thesis explores opportunities related to the Ottawa river watershed at macro (all the water reservoirs and river) and micro levels (the edge conditions). It argues that rivers and their water quality, the natural habitats, the edge conditions of shorelines, and the aquatic and terrestrial species, all need to be maintained and protected, in an approach that is inclusive of engagement and giving back. The educational approach will be

3 Houle 2018: 77.

4 NCC 2019.

part of the engagement and interaction with the river. This will lead to giving back through activities that will help to improve the conditions of the river. Direct group activities such as places for thinking and contemplation, discussions, planting, harvesting, and leisure engagements could be explored.

One of the central design strategies for this thesis is the idea of Floating Islands (**Fig 2.1**), that aim to become a new element of the Ottawa river watershed. Throughout the history of the Ottawa river, bridging between two geological sides had been always done with vessels like canoes and wood rafts. Through studying the history of the river, I learned that the Ottawa river was an important highway for transportation, for first nations and then later the European settlers. Referring to this history and being inspired by it, the floating islands are a series of accessible fluid movable and flexible structures that promote diversity, education and most importantly interaction. The floating islands celebrate our watershed through collaboration, participation and dialogue. The idea of crossing borders through any theoretical and physical obstacles is to provide an opportunity for humans and animals to travel through the river in a steady pace (**Fig 5.11**). The ability to access all parts of the watershed is essential in order to appreciate it.



**Fig 2.1** A view from water showing the a cluster of floating islands facing Bate Island. Drawing by author. See Fig 9.11 for the map of The Floating Islands.

The 'Voice of the River' thesis begins by seeking to understand the current ecologic conditions of the Ottawa River and the existing bridges, to assess the needs of local communities and the environmental, political and economic forces that impact the river to understand what is important right now, and in the near future, asking the question of what will the needs of people living in this area be over the next decades? This study of the river led to the proposal of floating islands. The project begins by seeking to understand the current conditions, assessing the existing edge conditions of the water and the land. This research takes inspiration from case studies of successful ideas and interventions related to fluid cities to amplify the changes that are needed in relationship with current conditions. These include the following:

*Floating Gardens* in Bangladesh;

Indigenous members harvesting wild rice across Canada;

Floating nests in Toronto Waterfront;

Skadar Lake and Chnagbai Island;

*Chicago River Edge Ideas Lab*;

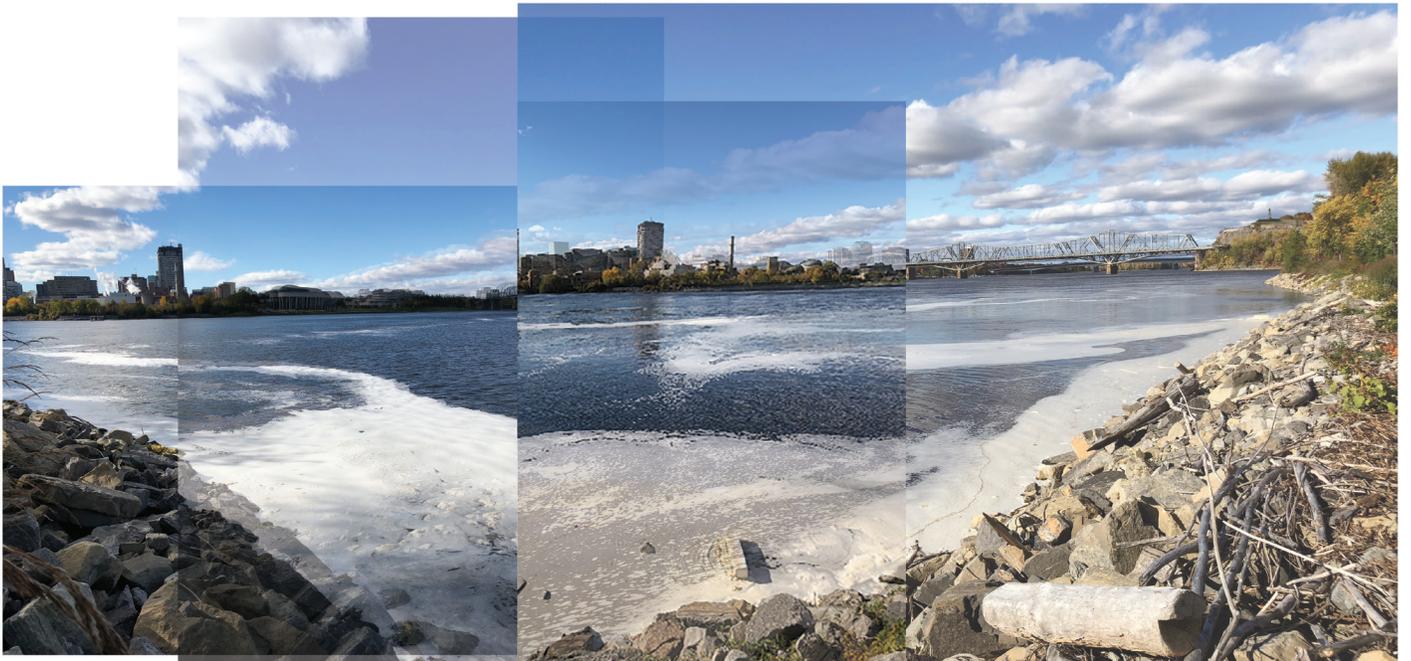
*Floating Garden Islands* in Chicago river;

*Theater of the World* by Aldo Rossi;

*The Floating Piers* by Christo Jeann Claud;

*Ponte del Redentore* in Venice.

The goal of this thesis is to propose Floating Island interventions as a catalyst to bring communities together, to create a stronger interaction with the water in order to know how to protect it better, and to create a dialogue and gather for harmony and celebration of unity.



**Fig 2.2** Documenting the river's edge looking north towards Hull and east towards Alexandra Bridge. Photographs taken by author. September 2018.

## A Journey along *the Ottawa River*

Voice of the River



**Fig 2.3** "Lake Capimitchigama: Headwaters or origin of the Ottawa River." Photography by Max Finkelstein. Published on Ottawa Riverkeeper's Map Gallery: "A Journey along the Ottawa River".



**Fig 2.4** "Lac Temiscaming: Wedged between steep cliffs up to 70 m high, forms the border between Quebec and Ontario." Photography by Meredith Brown. Published on Ottawa Riverkeeper's Map Gallery: "A Journey along the Ottawa River".



**Fig 2.5** "Opemican: An historic log floating operation centre. Steamboats, used to haul log booms, ferry cargo and passengers were repaired and stored for the winter at Opemican." Photography by Meredith Brown. Published on Ottawa Riverkeeper's Map Gallery: "A Journey along the Ottawa River".



**Fig 2.6** "Upper Ottawa River: One of the few sandy beaches between Ville Marie and Mattawa" This indicates the opportunities for the floating islands near these beaches. Photography by Mike Beedell. Published on Ottawa Riverkeeper's Map Gallery: "A Journey along the Ottawa River".



**Fig 2.7** "Otto Holden Dam: one of 19 major dams to get around when traveling the entire 1,272 km of the Ottawa River." Photography by Max Finkelstein. Published on Ottawa Riverkeeper's Map Gallery: "A Journey along the Ottawa River".



**Fig 2.8** Chalk River: Nuclear Laboratories along the Ottawa River. Opened in 1944 and still operates. Photography by Meredith Brown. Published on Ottawa Riverkeeper's Map Gallery: "A Journey along the Ottawa River".



**Fig 2.9** "Oiseau Rock: 150 foot high rock is a sacred site" for the Algonquin People who left behind an amazing ancient pictographs. Photography by Meredith Brown. Published on Ottawa Riverkeeper's Map Gallery: "A Journey along the Ottawa River".



**Fig 2.10** Rock Art: Creations each summer by John Cetrano at the tail of Remic Rapids. These creations everyday bring a lot of attraction to this site. This shows people care about art and aesthetics. September 2018. Photography by author.



**Fig 2.11** The Prince of Wales Bridge: Rail bridge first opened in 1880 and closed in 2005. September 18, 2018. Photography by author.



**Fig 2.12** Ottawa's Lemieux Island water purification plant. Opened in 1932 and it is still in use. May 2011. Photography by Rob Huntley.



**Fig 2.13** Chaudiere Falls/Dam, Chaudiere Island and Victoria Island. Also Three bridges (Chaudiere Bridge/Eddy st, Portage Bridge and Alexandra Bridge.) Photography by aerialphotographs.ca

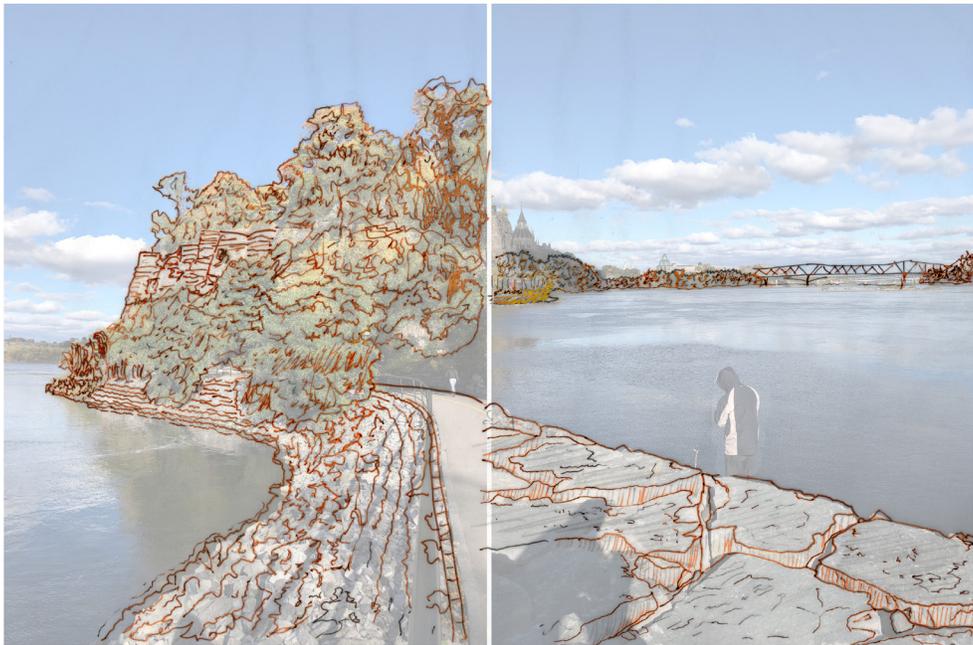


**Fig 2.14** Ottawa River Pathway/Trans Canada Trail. Facing towards east (Alexandra Bridge). September 2018. Photography by author.





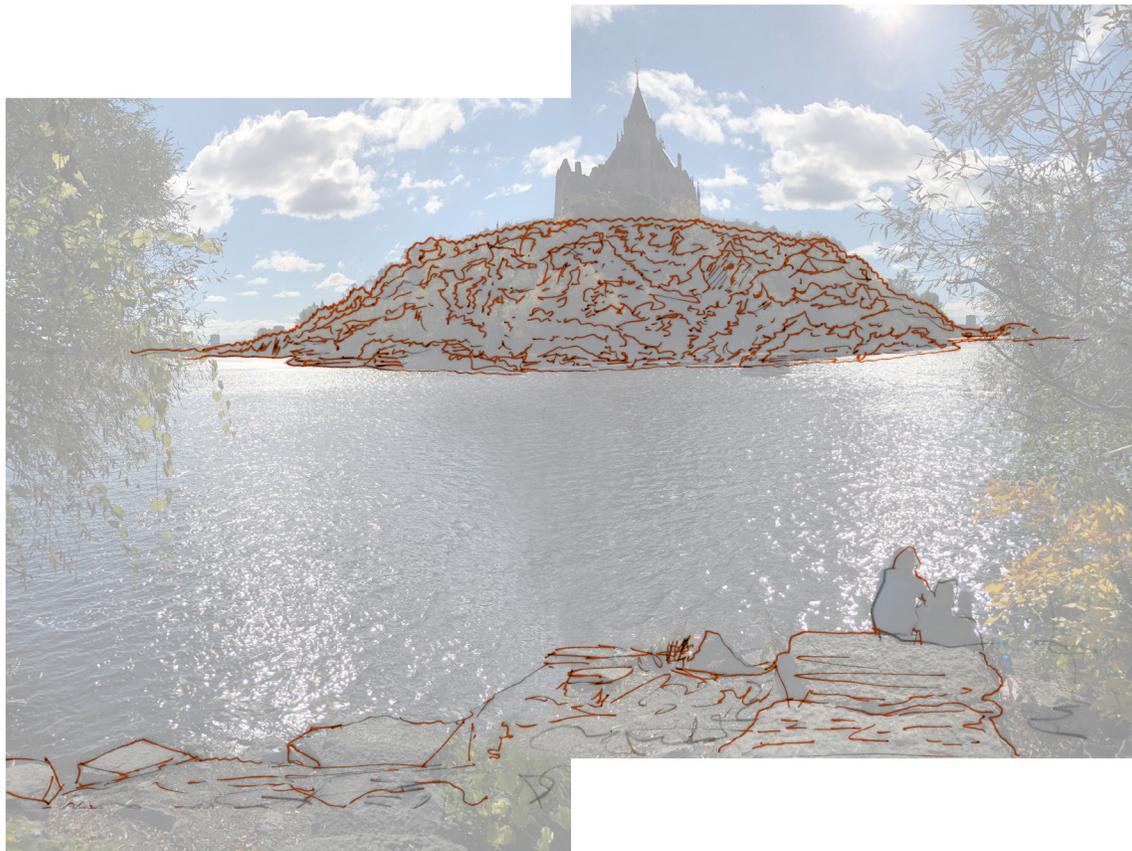
**Fig 2.16** The edge of the Ottawa River in relationship to Prince Wales bridge (left) and Alexandra bridge (right). Drawing by author.



**Fig 2.17** Exploring the edge of the Ottawa River through a drawing by author. Trans Canada Trail towards the cliff that Supreme Court of Canada is located (left image). Ottawa River Pathway near Richmond landing facing Alexandra bridge.



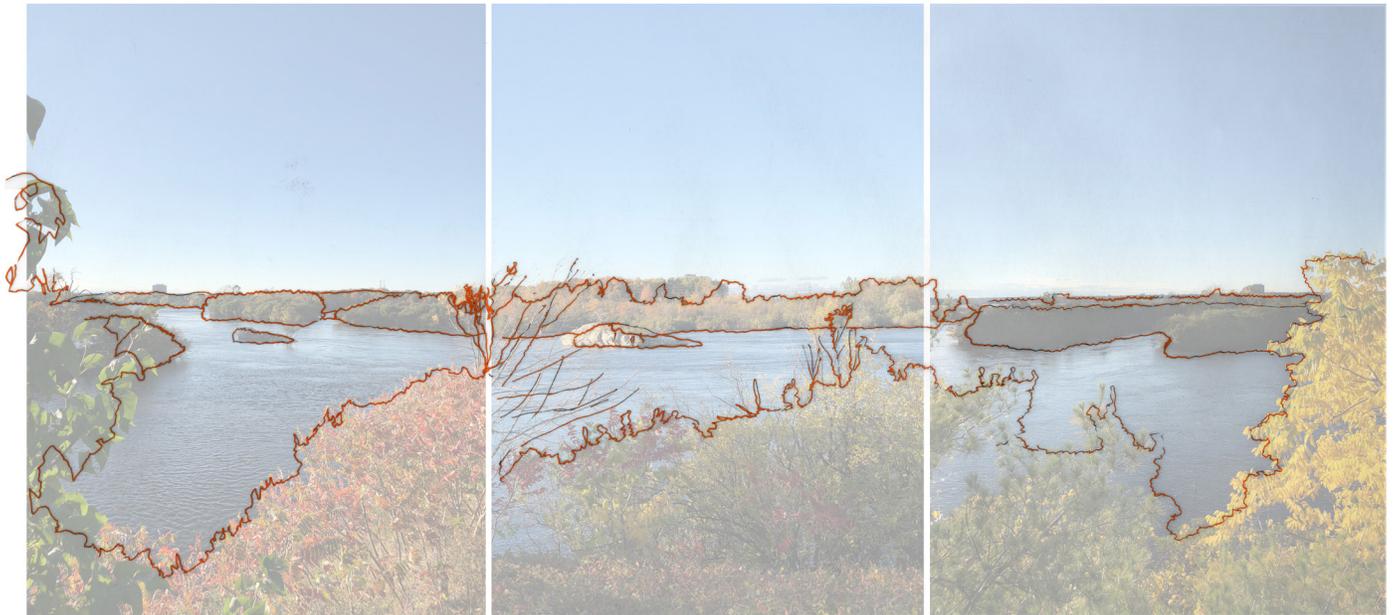
**Fig 2.18** Exploring the edge of the Ottawa River through a drawing by author.  
Sentier des Voyageurs near Runins Wave.



**Fig 2.19** Exploring the edge of the Ottawa River and imagining the Parliament hill as a giant island in the middle of river. Standing at the bottom of Alexandra bridge and looking at Parliament of Canada. Drawing by author.



**Fig 2.20** Exploring many edge conditions of the Ottawa River. Guillot Park (top left). View from Bell island facing towards Nicholas Island (bottom left). View from bottom of Portage Bridge looking towards Richmond Landing (middle). View from Trans Canada Trail near Royal Canadian Navy Monument facing east (top right). Tree and Plant conditions near Alexandra bridge (bottom right). Drawing by author.



**Fig 2.21** Exploring the edge of the Ottawa River through a drawing by author.  
View from Bell island facing towards Nicholas Island.



**Fig 2.22** Exploring the edge of the Ottawa River through a drawing by author. View from Ottawa River Pathway near Little Chaudiere Rapids, facing west.

## **Cities in relationship to water**

### Voice of the River

Through my past personal experiences about cities that have direct relationship to water such as London and Venice, I learned about the importance of water, a sensory natural element, in relationship to the city's inhabitants. As a result of this observation, I learned that:

- There exists greater demand on existing water supplies.
- Privatization rise and private shorelines increasingly separate the public from the river in most parts of the urban environments.
- People are more aware of water pollutants and therefore they don't want to use their bodies of water as a source for play and activity.
- Through my own visits to the above mentioned cities I have noticed how people feel calm, relaxed and balanced by being next to bodies of water such as artificial pools, canals, rivers, lakes and seas.

The focus of this thesis is on how architecture and water can bring communities together to learn more about the future of the Ottawa river watershed, our fluid cities and related issues. Researching the Ottawa River and its edge conditions, the old bridges between Ontario and Quebec stood out to me, and in relation with the river, the importance of water quality; sewage overflows and nuclear waste run off; dams' effects on the fish species; river access; river banks and regional boundaries. As a result, I began to question what has been done to celebrate the river in the recent years?

There are currently efforts underway by the non-profit organization, Ottawa Riverkeeper, to maintain the river healthy. On the other hand, there were and still are conflicts about land ownership around the Chaudière Falls (called 'Akikodjiwan Falls' by Algonquin First Nations) as well as the Victoria Island. Both islands that are considered sacred by speakers of Algonquin languages, where many ceremonies used to take place.<sup>5</sup>

Upon reading more about the work of leaders such as the Grandfather William Commanda, an Algonquin elder who passed away in 2011, I learned that he advanced the concept of the Circle of All Nations as a vision of peace among all peoples and asked the architect Douglas Cardinal to prepare architectural designs by removing the dam and hydro facilities for an Aboriginal historical centre, a peace centre and a conference facility at the Falls area.<sup>6</sup> This project's intentions was an inspiration for this thesis as it reflects welcoming all to gather for the purpose of reconciliation and celebration of unity.

5 Hendrickson 2014.

6 Hendrickson 2014.

Moving forward, through researching the Ottawa River, I learned that, with the exception of Douglas Cardinal's proposal on Victoria Island, no other significant public project was proposed in recent years to bring everyone together and promote peace.

*"The entire area is known as Akikodjiwan by the Algonquin, and like the rest of Ottawa and Gatineau, the territory is unceded Algonquin land. In addition, the area is considered sacred by many Algonquin."*<sup>7</sup>

Commanda's vision for the islands is known as Asinabka.<sup>8</sup> William Commanda's Vision for Asinabka shows a series of four visionary programs associated with these islands and the waters. **(Fig 3.0)** The four programs include:

1. Freeing the Chaudière Falls;
2. Creating a City Park and Historic Interpretive Centre;
3. Building a Peace Building Meeting Site;
4. Building an Aboriginal Centre.

While the exact reasons why this project did not move forward, as yet, are not entirely clear, it is possible that the lack of funding has had significant impact on its potential to be realized. This unrealized vision and unrealized project are lost opportunities for all people who associate with the Ottawa River.

This thesis would argue that just like the constant movement and ecological change of the Ottawa River, our relationship with and the future occupancy of this space needs to go through constant change as well. The floating Island proposal is created in response to the vision that William Commanda had, especially because Douglas Cardinal's proposal has yet to come into reality. **(Fig 3.1)** In conclusion, this also highlights why what is referred to as "the edge condition" is actually a complicated set of relationships.

7 Leonard 2016.

8 Asinabka 2003.

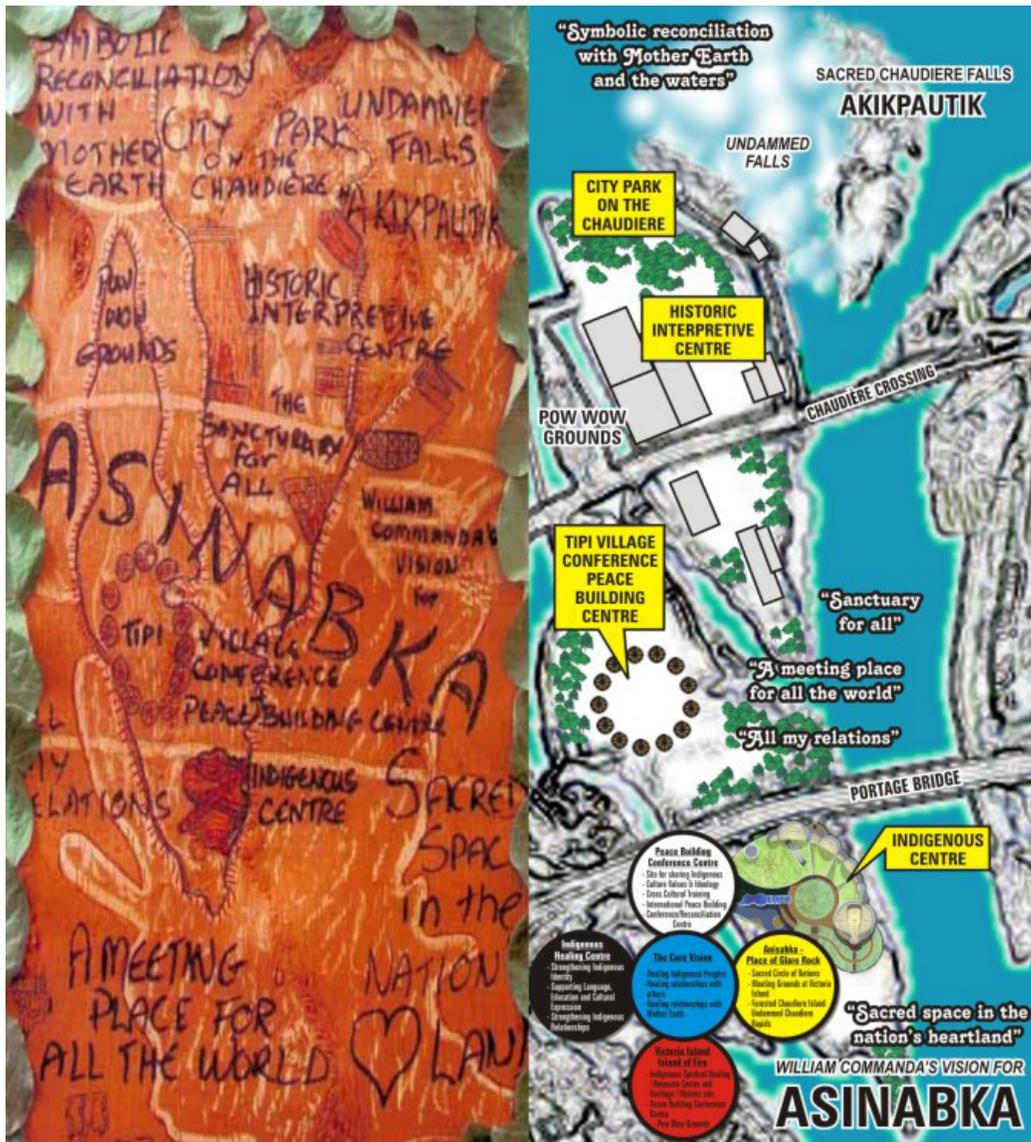


Fig 3.0 Drawings showing William Commanda's Vision for Asinabka.

Source: <http://www.asinabka.com>



**Fig 3.1** Douglas Cardinal Proposal: Asinabka Cultural Centre

The floating island, as temporary architecture has this capability to activate the communities, this will lead to giving back through activities that will help to improve the conditions of the river. As an alternative solution, direct group activities such as places for thinking and contemplation, discussions, planting, harvesting, and leisure engagements could be explored. These temporary floating islands promote diversity, education and most importantly interaction. They celebrate our watershed through collaboration, participation and dialogue which is essential to the complexity of this region.

By reading *Paradigm Islands: Manhattan and Venice* by Teresa Stoppani, the role of forward thinking towards believing in changeable networks emerges. As Stoppani examines both the cities of Venice and Manhattan, she states that both are constantly empowering the change. She describes the 'City' as the "space within" and she proposes "the idea of a city that is strong and continues to 'work' because it not only undergoes change, but empowers change."<sup>19</sup> It is inclusive, it accepts, absorbs and incorporates. It doesn't have an inside nor an outside. So, what emerges from Stoppani's book is the city that through 'rules' and 'forms' accommodates an ever changing present.

Therefore, fluid cities like Manhattan and Venice have affected our emotions, and relationships to one another. Through different fluid “accumulations”, we conceive a way of living that is present and will constantly change due to these forces.

By using Stoppani's comparison on fluid cities like Manhattan and Venice, I better understand the Ottawa River and its surrounding cities. The fluid ‘accumulation’ is clearly visible along the Ottawa River, despite the fact that the existing conditions including roads, bridges and treatment centers that are based on the old models of the nineteenth century, and especially the 1950 plan for the national capital, which is one the most significant documents in Canadian planning history. Jacques Gréber, a French architect, planner and landscape architect, was hired to transform Ottawa and Hull into an “attractive model capital”.<sup>10</sup> As a result most models proposed and built by him, do not comply with the contemporary standards. For instance, most of them are not pedestrian friendly. Moreover, there is an important linkage point associated with the Canadian Pacific Railway called the Prince of Wales Bridge that is unused now. The city of Ottawa currently owns this bridge and despite the recent Ottawa transportations developments, there are no clear plans on what the future of this bridge will be. However, the City of Ottawa is now in the position of being mandated to renovate it. During the early 2018, The Canadian Transportation Agency (the “CTA”), directed the City of Ottawa to take the steps necessary to restore the Ottawa River Line, including the Prince of Wales Bridge within a twelve-month period. In the response to that Mayor Jim Watson wrote in a letter on March 03, 2018, explaining the issues that are being faced “following a technical review of the required implementation timelines.- Staff have assured me that no level of government could undertake to design, finance, procure and restore this major railway bridge in less than two to three years, versus the twelve-month deadline set out by the CTA”.<sup>11</sup> After a year now I am aware that this issue is still ongoing, and recently “the City of Ottawa and the Canadian Transportation Agency are currently locked in a legal dispute in Federal Court over the Prince of Wales Bridge.”<sup>12</sup> Moreover, I see the Prince of Wales Bridge as a potential instigator of revitalization to not only add values, and satisfy peoples needs, but also to bring the needed awareness of the water. As the Ottawa River is continuously changing, it has continuous impacts on its edge conditions as well as the fluid cities around it.

10 Gréber 1950.

11 Watson 2018.

12 Britneff 2019.

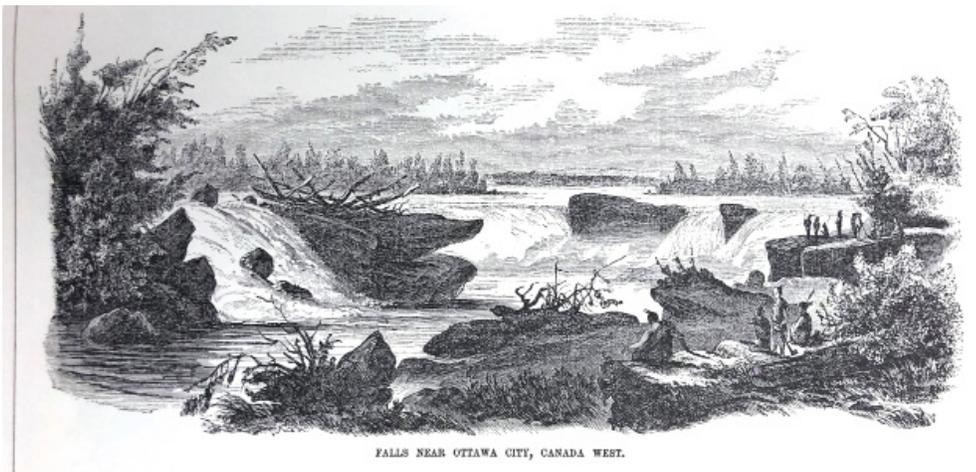
## History of the Ottawa River

### Voice of the River

The indigenous people were the first inhabitants that originally moved from Asia to North America. The Algonquin indigenous people inhabited the Ottawa valley for thousands of years prior to European colonization. Their connection to “Earth mother”, and especially to water is seen through journals dating back to 1613 where Samuel de Champlain, draftsman, geographer and explorer, traveled up the river, reaching the Gatineau area for the first time. One of his team members, Perrot for example, closely studied the Ottawas and observed their religious beliefs. The records he kept from 1680 to 1718, published in 1864, stated:

*“They believe that before the earth was created there was nothing but water.”<sup>13</sup>*

This is an early evidence of the valuable relationship of the Algonquin people with the water. Most of their ceremonies are water and land based. Furthermore, Perrot stated that they were into hunting, and “fishing with nets was important to the Ottawas in their lakeshore life.”<sup>14</sup>



**Fig 4.0** Falls Near Ottawa River, Canada From Ballou's Pictorial Drawing-Room Companion, February 14, 1877. Drawn by Mr. Kummer, engraved by John Andrew.

13 Bond1984: 13.

14 Ibid: 14.

Furthermore, with explorations of French and English, North America, including the Ottawa Valley, went through many transformations. The following timeline aims to showcase a more detailed information, gathered from reliable sources in order to present these transformations.



**Fig 4.1** Bird's Eye View of Ottawa River  
(1865-1905) Public Archives Canada.

## **Colonial History Time-line of the Ottawa River**

### Voice of the River

Below I enclose a succinct time-line of the Ottawa river and the surrounding region's history during European colonization:<sup>15</sup>

"Archaeological information indicates that the Algonquin people have lived in the Ottawa Valley for at least 8,000 years before the Europeans arrived in North America. Algonquin is the name of the cultural linguistic group that includes many "tribes", of which the Algonquins are one."<sup>16</sup>

1603 The French made contact with the Algonquins for the first time.

1613 Samuel de Champlain, draftsman, geographer and explorer, traveled up the river, reaching the Gatineau for the first time.

1614 Fur trade started to make use of the Ottawa river.

1615 Champlain met the Algonquin people at the mouth of French River, their numbers estimated to be 4000 to 6000.

1624 The demand for beaver was the reason the Dutch had tried to open trade with the Algonquin and Montagnais.

1650 Remaining Algonquin in the upper Ottawa Valley were attacked and overrun.

1650 -66 Traveling along the Ottawa River became dangerous because of conflicts with Iroquois.

1667 French Troops attacked the Iroquois homeland in order to bring peace to the region.

15 The information for the construction of the *Colonial History Time-line of the Ottawa River* is taken from a series of sources listed here:

Bond, Courtney. *Where Rivers Meet: An Illustrated History of Ottawa*. Windsor, 1984.

Ottawa Riverkeeper. *History of the Ottawa River*.

Tanakiwin. *Our Proud History, Algonquins of Ontario*.

The Canadian Encyclopedia. *Ottawa River*.

16 Tanakiwin: "Our Proud History, Algonquins of Ontario".

- 1680 Perrot started to study the Ottawas and observed their religious beliefs.
- 1718 Perrot wrote "Indians believed that before the earth was created there was nothing but water."
- 1754 English and French started a open war in North America.
- 1760 English captured the whole of New France.
- 1760 English took advantage of the French route to the west via the Ottawa.
- 1761 Many of the Canadian Canoeists, the Voyageurs, as well as interpreters, were now in the employ of the trading groups.
- 1763 English made a Colony.
- 1763 Quebec took much of the Ottawa River.
- 1791 The provinces were devided.
- 1806 First Lumber industry began.
- 1826 Rideau canal construction began with initial purpose for military, then later commercial purpose.
- 1826 The first union bridge was authorized to be built over Chaudiere Falls.
- 1829 Ruggles Wright was the first person to introduce timber slides to Canada.
- 1816 Migration began from west Europe to united states and Canada.
- 1830 Philemon Wright made roads for his side of the river to take timber from the Gatineau.
- 1832 The Rideau Canal was opened.
- 1833 The population of upper Canada increased by 50 percent. Large number moved to the Ottawa valley.

- 1850 Canadian Government eventually established ten reserves for Algonquin use and occupation. One in Ontario, nine in Quebec.
- 1855 "By town" became the city of Ottawa.
- 1860 Construction of The Prince of Wales Railway Bridge was began.
- 1865 Demand for square timber collapsed.  
By then Ottawa had a new industry: Government.
- 1868 Construction of Chaudiere Dam (first dam) began.
- 1877 First demonstration of telephone in Ottawa.
- 1891 Construction of first Generating Station began (Chadiere).
- 1900 Great Fire of Ottawa-Hull.
- 1944 Chalk River Nuclear Laboratories opened along the Ottawa River.
- 1952 Chalk River nuclear first incident that the reactor building was seriously damaged by hydrogen explosions that resulted in some 4,500 tonnes of radioactive water in the cellar building. This water was dumped in ditches around 1600 metres from the border of the Ottawa River.
- 1958 Through another major incident, the entire building was contaminated and resulted a large area outside of the building to get contaminated as well, because the valves of the ventilation system were opened.
- 1979 Canadian Canoe Festival started annually.
- 2001 The Ottawa River Keeper organization established.
- 2005 The Prince of Wales Railway Bridge stopped operating.
- 2017 Spring Ottawa River Flood.
- 2018 Ottawa River South Shore Riverfront Park Plan by NCC.

## Importance of the Ottawa River and The Forces that impact its future

### Voice of the River

The Ottawa River is located in the Canadian provinces of Ontario and Quebec, and is 1,271 kilometres long. The Ottawa River has a strategic position in Canada as a main highway into the interior water bodies.

*"This River also marks the dividing line between two distinct geological areas. To its north lies the hard mass of the Canadian Shield, rock worn by glaciers and time into rounded hills strewn with lakes in its hollows. Southward, covering many horizontally-lying strata of sandstone, limestone, and shale, which outcrop here and there, is rolling farmland, detritus of clay and sand left by glaciers."<sup>17</sup>*

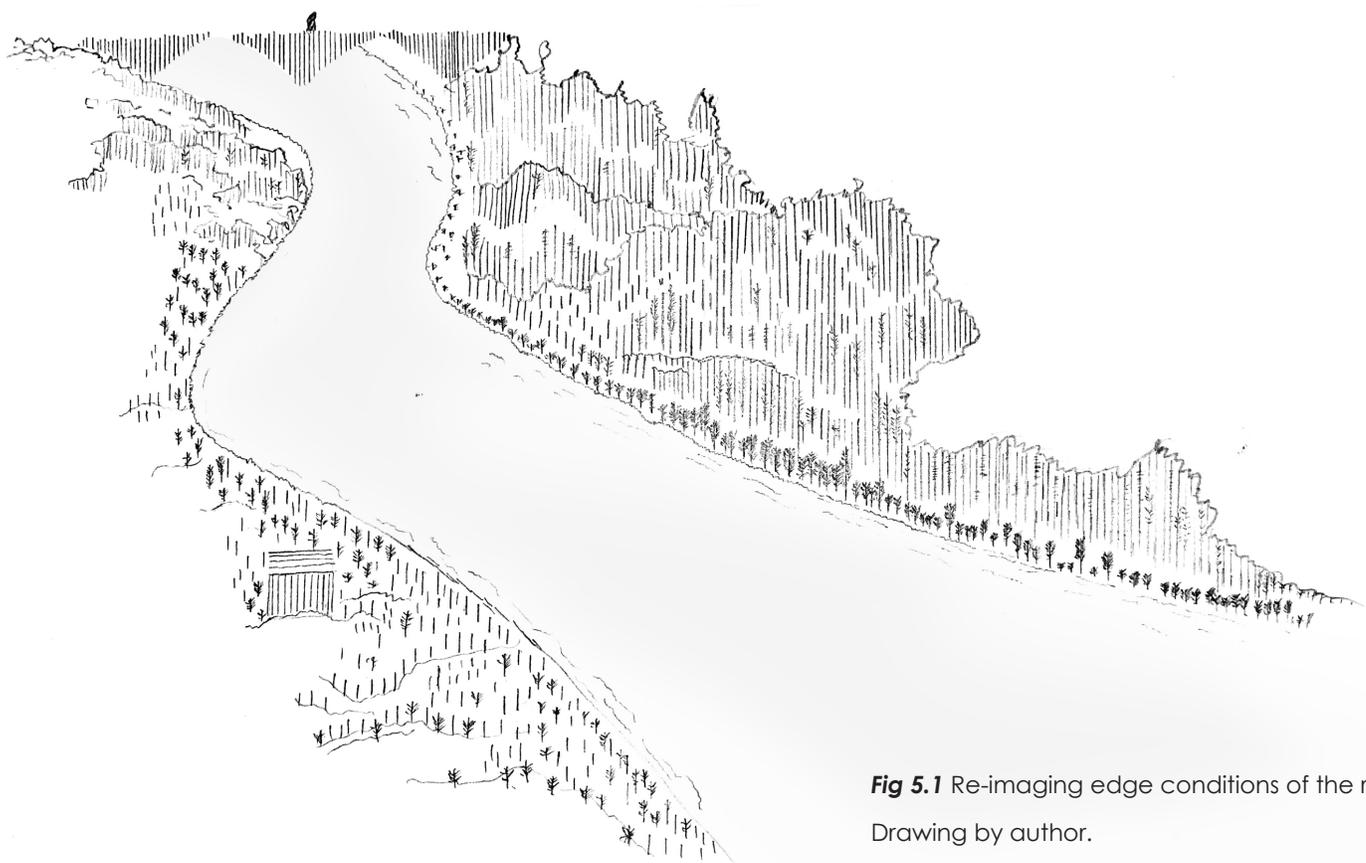
According to the Ottawa Riverkeeper Organization, the Ottawa River is home to 93 fish species.

17 Bond 1984: 11.



**Fig 5.0** Hand Drawing of Large portion of The Ottawa River (from Fort-Coulonge to Hawkesbury). Drawing by author.

For most of the Ottawa River's length, it defines the border between the provinces of Ontario and Quebec. This political line was also visible in terms of having to gather information from various and distinct sources, that would normally, in places where there is no jurisdictional and political divide, be found in one place. In most cases, the information provided by municipalities and cities and other organizations was solely related to that individual province. Therefore, I went through the challenging process to bring together the resources that are kept separate by the two provinces that necessary to create the mappings that are included in this thesis. Moreover, the explorations through mapping showcase important information, helping to examine the forces related to the river and its watershed as well as opportunities related to it. Hand drawings made during site visits are the primary tool during explorations of the edge conditions. To examine the historical continuity and changes of the river, one needs to experience it first hand to connect with it, and with those who are interested in the river and its future. Having a panoramic view over the sensory river and landscape is phenomenal, however it is difficult to experience it unless one stands on top of a human-made structure like a bridge.



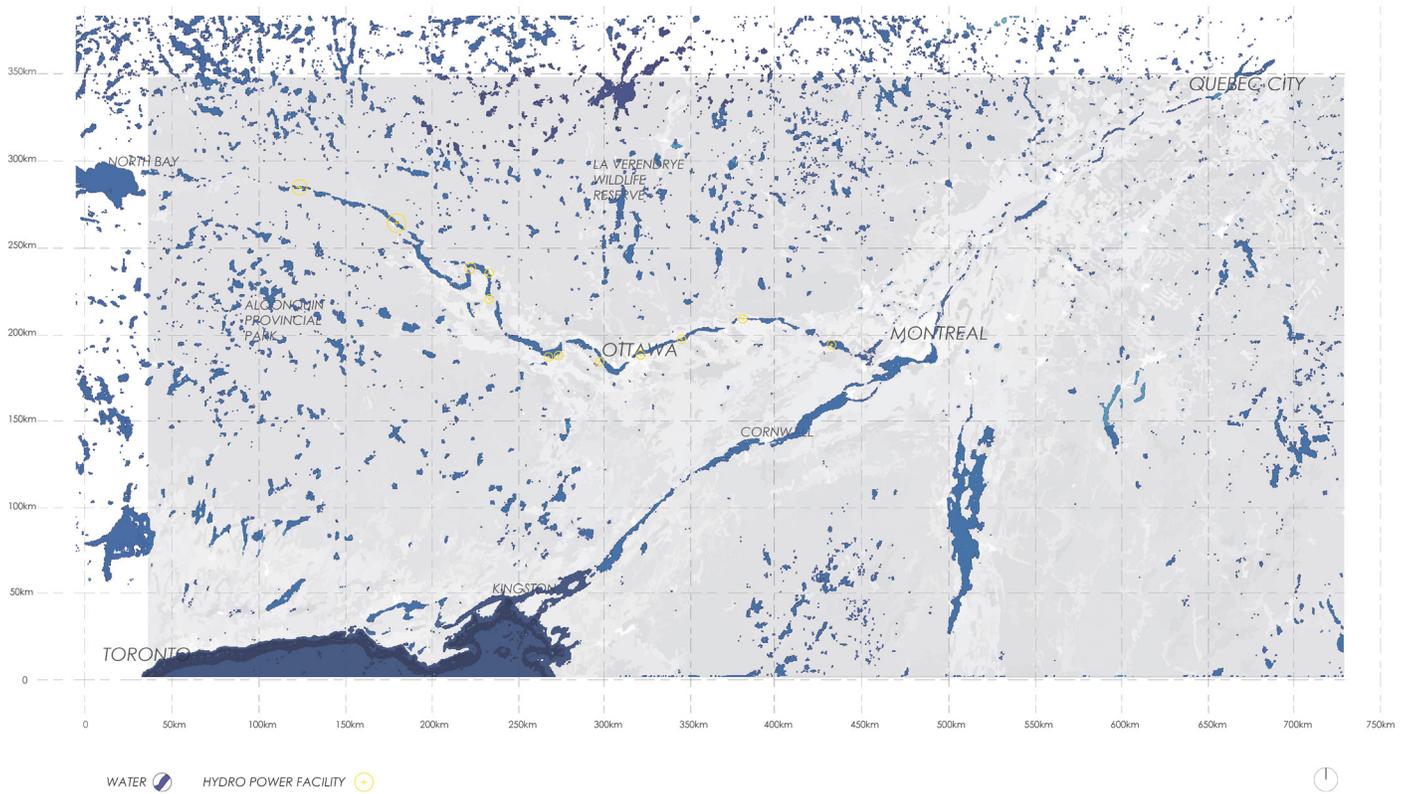
**Fig 5.1** Re-imagining edge conditions of the river.

Drawing by author.

Through my experience volunteering with the Ottawa Riverkeeper Organization, I learned more about the river as well as the entire watershed. I learned to think about the watershed rather than the riverfront. The reason behind this reflects how every lake, water reservoir, pond and river is connected to each other and eventually moves out to the seas and the oceans. The following Regional Map represents this unique quality (**Fig 5.2**).

### Regional Map

THINKING WATERSHED, NOT WATERFRONT



**Fig 5.2** Regional Map. Drawing by author.

The interconnectivity of the watershed creates an infinite river.

*“The line of a riverbank has for centuries anchored much more than a flow from source and destination in the sea; it has also anchored a flow from the sea back to the source”*<sup>18</sup>

Da Cunha explains that this question simply by bringing the idea of how the water evaporates from the sea, and this happens more rapidly as surface area of water increases. He further explains many other ideologies of how “for centuries the dominant belief was that the return to source of rivers was through the earth”<sup>19</sup> In this cycle, Da Cunha talks about how the water of the sea entered the earth and by pressure, capillary action, and vaporization rose to springs. Moreover, a similar idea was represented by Leonardo da Vinci in the fifteen century when he says that Springs are “burst veins in the summits of mountains.”<sup>20</sup> The notion of how this circulation allows for salt to be removed and fresh water being revealed on surface again. Da Cunha explains in more details the other opinions like Kircher’s idea of “wind working on surface like a pump to send water up”, and also Frank Dawson Adams’s idea of machines and how naturally using pressure, vacuum, fire and through other means this process happens.

Furthermore, Da Cunha writes about how a number of individuals “dared to ponder the return route through the air rather than earth, although this was found more difficulty to believe possible.”<sup>21</sup> Da Cunha wrote about Pierre Perrault’s research and how he measured the volume of rain that fell in the upstream catchment of the Seine. Perrault published his finding in 1674 under the title on *the Origin of Springs* that rainfall volume is to be six times the amount that flowed in the river. This research was supported by other scholars such as Thomas Huxley and how “the waters of the earth move through a continued cycle, without beginning and without end.”<sup>22</sup>

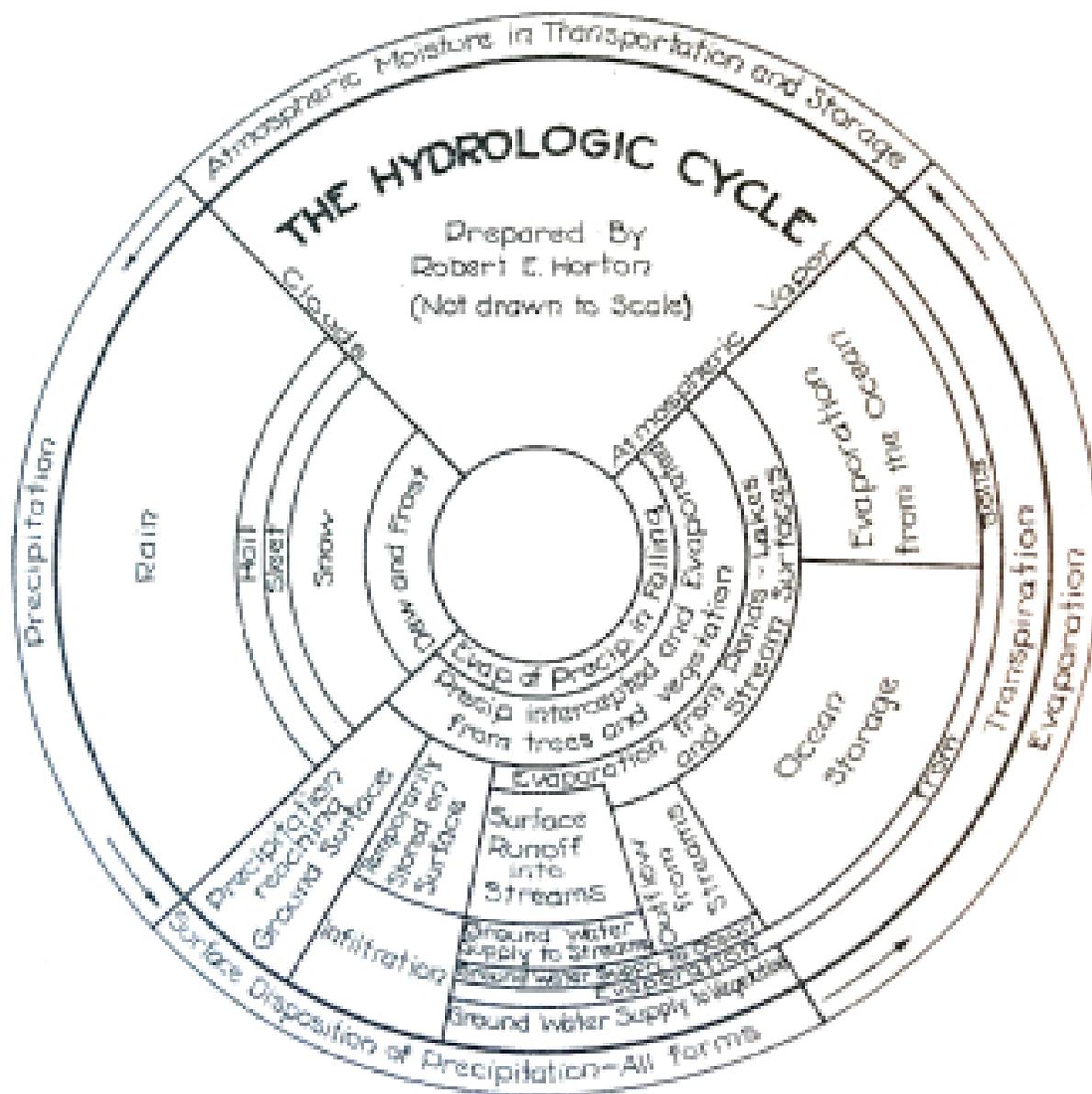
18 Da Cunha 2018: 62.

19 Ibid: 63.

20 Ibid: 65.

21 Ibid: 65.

22 Ibid: 67.



**Fig 5.3** The diagram of the cycle, writes Robert E. Horton, is intended "to show the principal steps involved in the hydrologic cycle in the most typical case, that of a drainage-basin tributary to the ocean."

Through in-depth research that Da Cunha has done, he argues the importance of rain over rivers. According to Da Cunha:

*[the] "extended route of water is taught today as the hydrologic or water cycle. It is not diagrammed with an eye positioned above the earth looking down as maps are; it is rather diagrammed with a mind that travels with water through its many states (liquid, solid, and vapor), processes of transformation, and places some of which can be obscure and elusive."<sup>23</sup>*

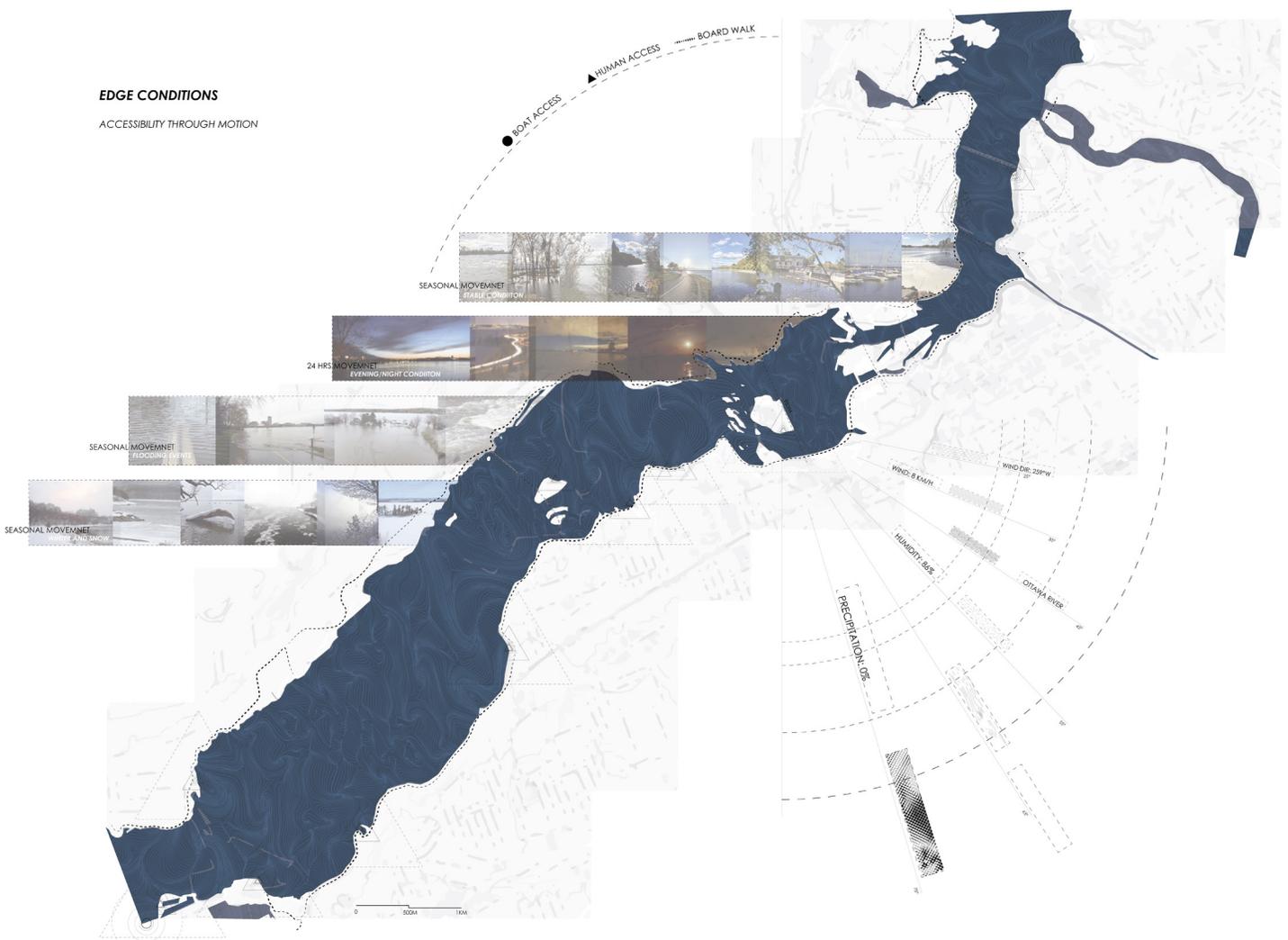
Da Cunha further explains that this water lends itself to being engaged materially in terms of a unit of hydrology rather than being engaged visually in terms of the points and lines of geography.

This is clear when I take a look at the water cycle map created by Robert Horton (**Fig 5.3**). According to his map and (**Appendix A**), the Hydrological Cycle (water cycle) is made of four main states:

1. Atmospheric Moisture in Transportation and Storage
2. Precipitation
3. Surface Disposition of Precipitation - All forms
4. Evaporation

Moreover, this map shows the more inclusive states and actions of this cycle. In this way, it is easier to understand the connection within all the natural forces and their phenomenology. The waters form a continuous flow as it happens through out many years in The Ottawa River Watershed. Many precious moments from hydrological cycles starting from any source, any destination and with many participants. For now, however, the flowing water of The Ottawa River dominates the communities surrounding it, and the question is do we all know about the importance of the watershed? If there is a chance that people do, how can we educate people about the importance of it through a sensory architecture?

The Edge Conditions along the river offer a dynamic experience (**Fig 5.4**). The combination of the natural edge conditions and the human-made merge together to offer an artificial / natural effect. Through the journey, where density grows, the natural wetlands disappear. The artificial asphalt material of the board walk along both sides create a route designated mostly for bikers, rather than for walkers. There are opportunities for people to access the water through boat decks or existing sand beaches. Therefore, the existing condition offers a potential to rethink the edge experience.



**Fig 5.4** Edge Conditions (Accessibility Through Motion). Drawing by author.

Along the Ottawa river, there are many pollution nodes that constantly are effecting the overall health of the river. The major is *The Chalk River Laboratories (CLC)* located on the banks of the Ottawa River, near Chalk River, Ontario, “approximatley 200 kilometres upstream of Ottawa-Gatineau.”<sup>24</sup> **(Fig 2.8)** This is an ongoing problem that was initiated by British and Canadian nuclear researchers in 1944. According to the Riverkeepers CLR generated “numerous radioactive waste plumes migrating in uncontrolled fashion, contaminating wetlands, groundwater, surface water bodies, and streams draining into the Ottawa River.”<sup>25</sup> Through years of operation in early 2018, Ottawa Riverkeeper announced their serious concern on CLN's application for a 10-year operating license renewal. However, months later the Canadian Nuclear Safety Commission (CNSC) approved CNL's license renewal for the full 10 years. Also, the proposal was made to have a permanent dump for Nuclear waste at the site of Chalk River Nuclear Laboratories, situated on the banks of the Ottawa River. Riverkeeper along with Algonquin Anishinaabe Nation Tribal Council have stood up against this extension of the Environmental Assessment. Thankfully Ottawa Riverkeeper has been vocal about their activities and risks and have been heavily involved to control such activities through hiring experts to review the “Environmental impact statements for the disposal facility” and also participating in a variety of meetings and numerous site visits.

The issues that rise in relation to the disposal of Nuclear waste are from humans to humans + nature, without underestimating also the circumstances for future generations. There are countries such as Germany that have taken decisions to not rely on nuclear energy and have begun a project to work on alternative renewable energy resources. In 2014 “Germany announced plans to completely phase out the use of nuclear power by 2022 in favor of renewable energy sources.”<sup>26</sup> While there are culturally specific factors that play in different regions, based on geographic locations and history, in arriving at such decisions, there are things that can be learned from every example. Germany is in fact a very specific case with its own history, and it serves as a term of comparison from which something can be learned. In 2014 they transformed a nuclear site into an incredible adaptive reuse project **(Fig 5.6)**. According to *inhabitat* magazine, this park attracts hundreds of thousands of visitors every year.

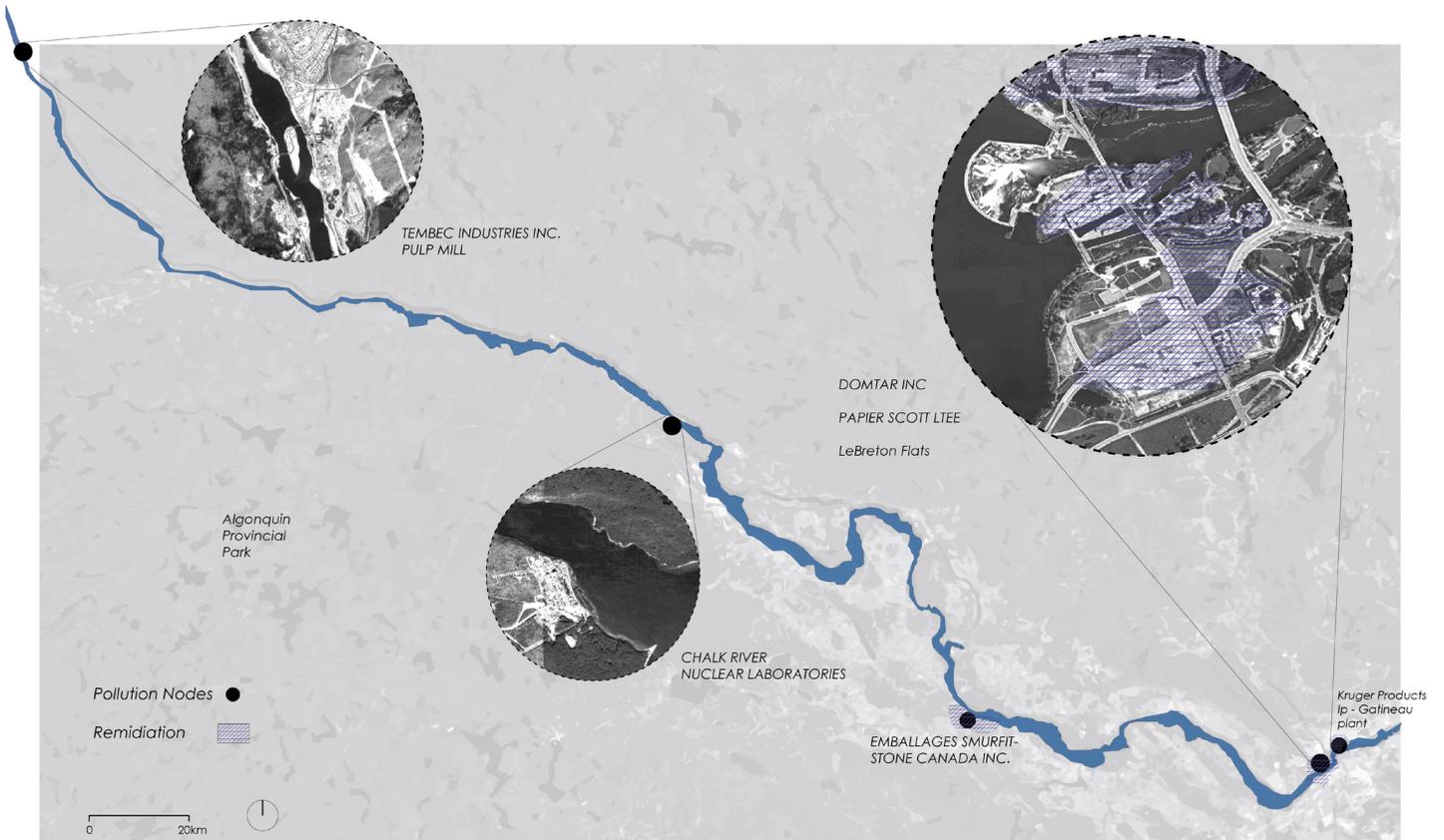
24 Ottawa Riverkeeper: “Issues”

25 Ibid: “Issues”

26 Morgan 2014.

Perhaps events such as the Chernobyl Nuclear Power Plant meltdown has impacted them to make this decision today. Looking at this successful transformation, there is an important lesson not only for Germans but also all other nations to learn from past catastrophic mistakes related to the history of nuclear energy. It is unfortunate how in Canada, just 200 kilometers from the nation's capital, a nuclear power plant still continues to operate while it has already impacted the land, water, animals and us humans without us really being aware of it. Looking at the recent history of the Ottawa river as indicated in the time line, during 1952 and 1958, there were two major incidents that effected the Ottawa river and its ecology. While, not everyone in the Ottawa region today may be aware of this history of nuclear accidents, it is a fact that Ottawa has "its own" history, and should develop a concern for the possibility that such accidents or other accidents may happen in future.

What can be taken from the case study in Germany is that there are alternative renewable solutions that can be explored.



**Fig 5.5** Pollution Nodes and Remediation Actions. Drawing by author.

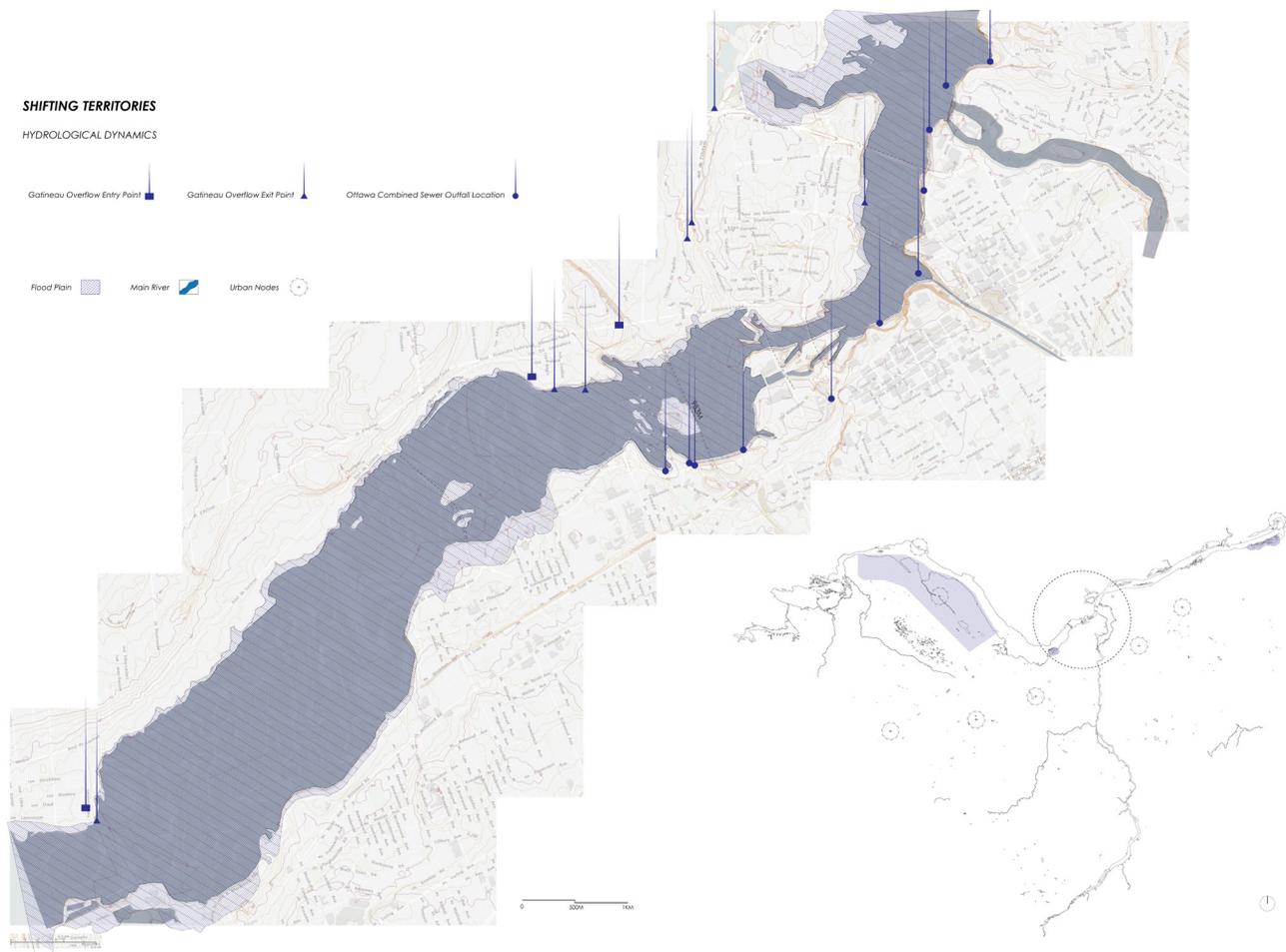


**Fig 5.6** Wunderland Kalkar Bird Eye view. Kalkar, Germany. Photo by Groupon.



**Fig 5.7** Wunderland Kalkar Bird Eye view. Kalkar, Germany. Photo by Herald.

The Ottawa River is constantly shifting and changing at the edge conditions. During the spring transitions, larger volume of water runs through the river. Zooming into a closer area, it is clear that the Ottawa River forms a shifting territory, due to cities' infrastructures political conflict, the extreme flooding becomes possible and visible (**Fig 5.8**). The locations of Sewage overflows during different seasons lead to an emerging situation that makes for a vulnerable condition. Looking at this map, there is a lack of hydrological dynamics that arises from entry points and exiting points. This results in unstable conditions for both geological sides of the river.



**Fig 5.8** Shifting Territories. Drawing by author.

Rivers spread with the rains and melting snow during the spring, and when this happens, they recede to leave behind a different place. Da Cunha mentions Gopa Samanta's argument, in *Dancing with the River*, that

*"changes in the course of rivers are not looked upon kindly by the modern state. The rivers in Bengal, with their constantly shifting and changing courses, were seen as inconvenient and in need of control. The long history of human life and living with water became invisible and was ignored by the modernist worldview that was in favor of engineering its control. Thus, engineering control of rivers came to be seen as fundamental to the economic and social advancement of communities living with rivers."*<sup>27</sup>

Although the sites research are very different, I believe rivers are part of the same ecological families. In the case of the Ottawa River just like the rivers in Bengal, the advancement of technology and engineering infrastructure created a new desired line that perhaps did not consider the changing courses of the river. When the perception of separating the land from the water intentionally happens, sooner or later, the river will cause shifts and find its ways to create serious damages to the inhabitants. This was experienced in the 2017 Spring Flood when a massive flood happened in the region of Ottawa and Gatineau **(Fig 5.9)**. As presented in an article by the Ottawa Riverkeeper, *Summary of the 2017 Spring Flood*,

*"The main cause of the exceptional 2017 spring flooding can be described easily in just a few words: rain, rain and even more rain. Unusually heavy rainfall, coinciding with melting snow that had already saturated the ground and swollen waterways, generated exceptional volumes of water in the Ottawa River basin."*<sup>28</sup>

Although this article also talks about the operation of dams and reservoir management, the amount of rain and snow melt was not controllable, and that led to a serious disasters especially on the Gatineau side of the Ottawa river.

27 Da Cunha 2018: 103.

28 Ottawa Riverkeepr 2018: 1.



**Fig 5.9** A flooded street in Gatineau, Que. By the flood's end, some 5,371 homes in the province of Quebec were flooded. May 10, 2017. The Globe and Mail.

# Inhabitants and Communities

Voice of the River

The following map, shows the different kinds of land use along the Ottawa River. The majority of the green zones along the river are owned by the NCC.

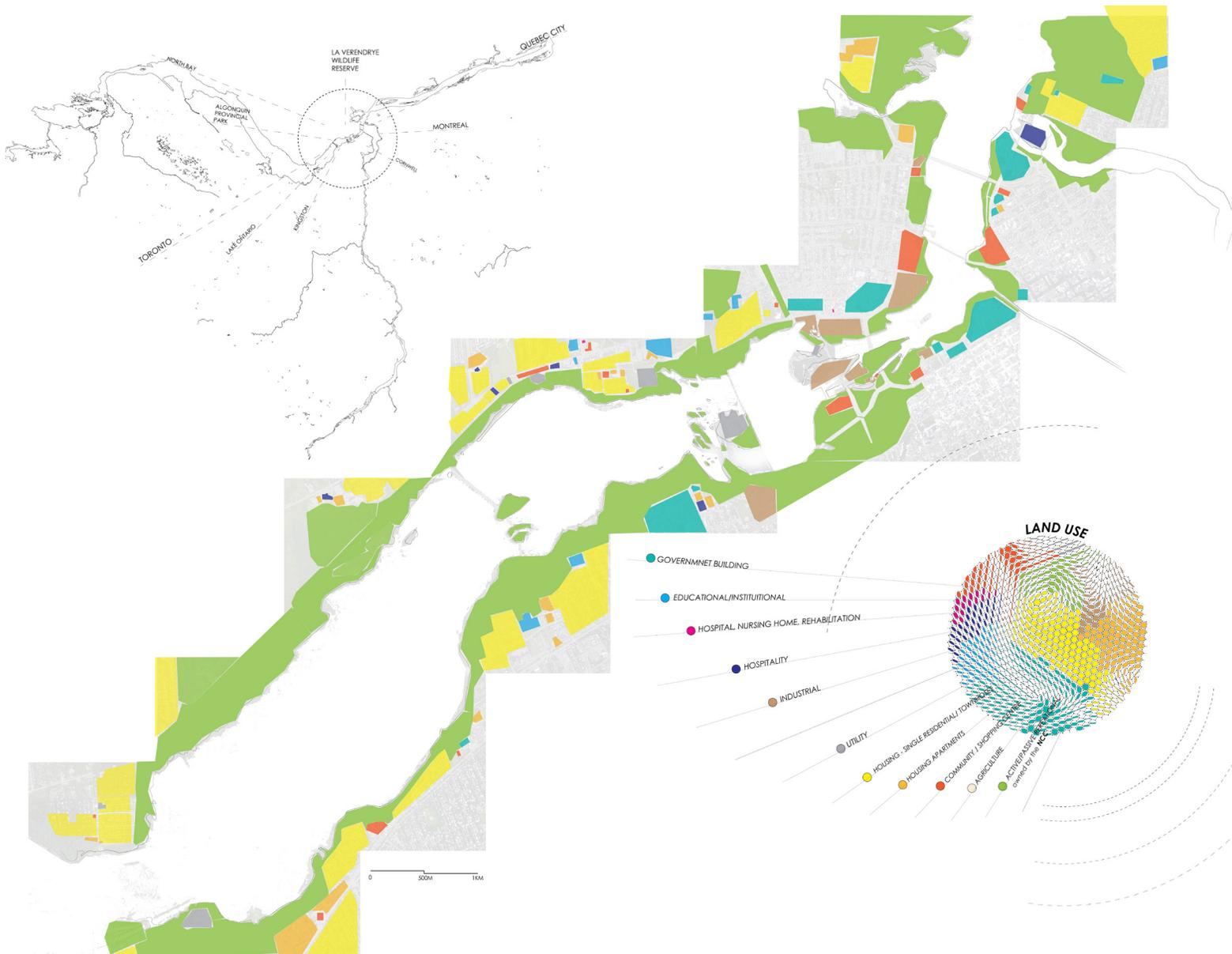


Fig 5.10 Land Use. Drawing By author.

## *The Sites*

### Voice of the River

Four sites were studied for this thesis, allowing me to understand the importance of the edge conditions. I believe that there are many opportunities for interactions between the river and people in all parts of the river. A site can be permanent but also can be temporary. The floating islands refer to generating adaptable characteristic that can be part of any site along the river. When the floating islands come together, they also form a site on water by themselves. They question the historical continuity and the possible changes of the elements associated with the Ottawa river. The importance of access . The following sites have more potentials for my thesis proposal that I will explain more in Chapter: The Floating Islands. In the following pages, I include a map that identifies the key four sites for my intervention. **(Fig. 5.11)**.

Site One is located around Zone 1 **(Fig. 6.0)**.

Site Two: Zone 2 **(Fig. 6.2)**.

Site Three: Zone 3 **(Fig. 6.3)**.

Site Four: Zone 4 **(Fig. 6.5)**.

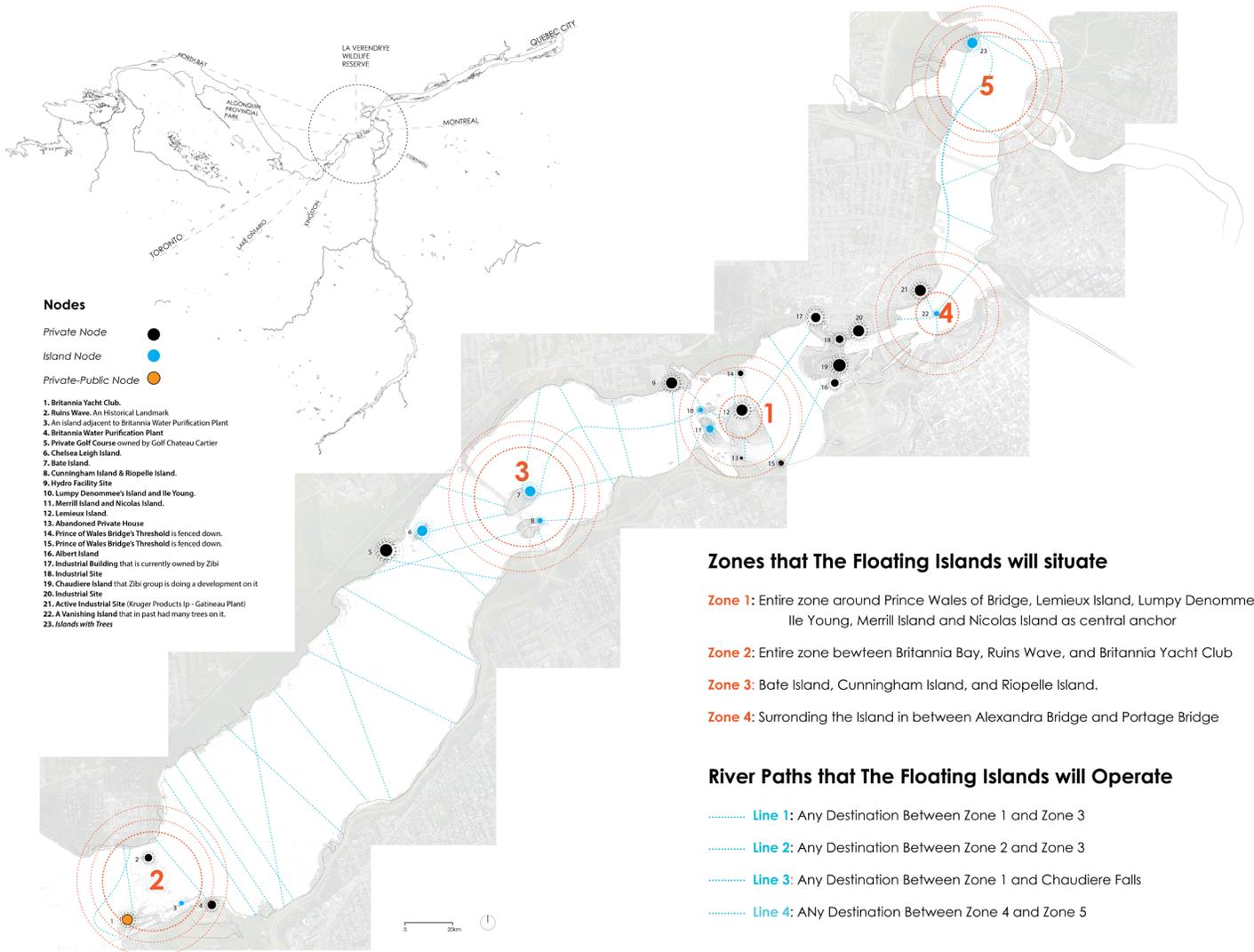


Fig 5.11 Map of The Floating Islands. Ottawa River. Drawing by author.



**Fig. 6.0** Portion of the Prince of Wales Bridge. Photomontage using Drone Documentation by Moe Cote on YouTube.

## The **Site 1**

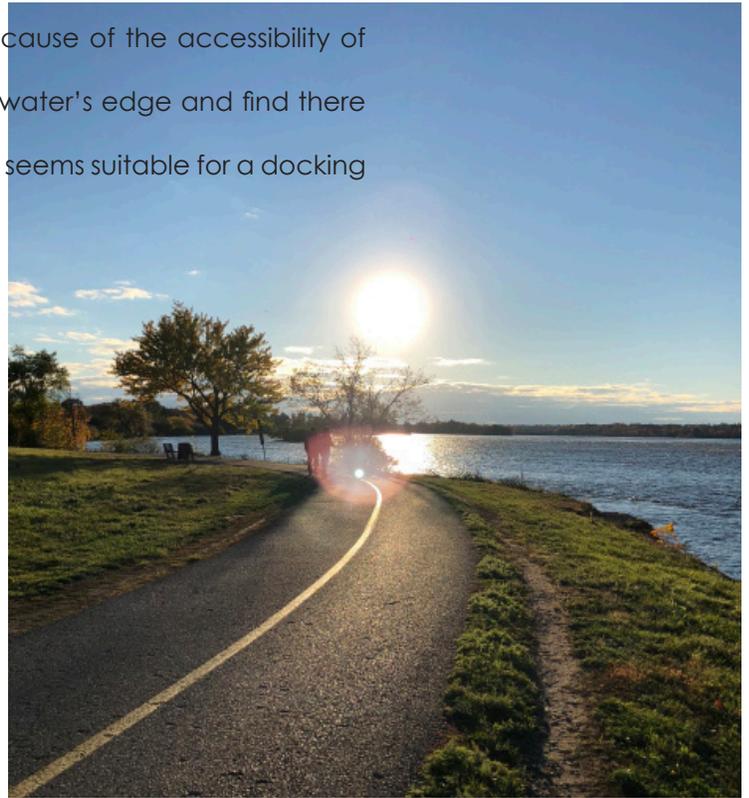
The area around the Prince Wales of Bridge is vast. The width of the river extends approximately 978m. Visiting this site, I realized that the depth of the river is also more than expected. Therefore, I see a lot of potential for the floating islands to move around this site.



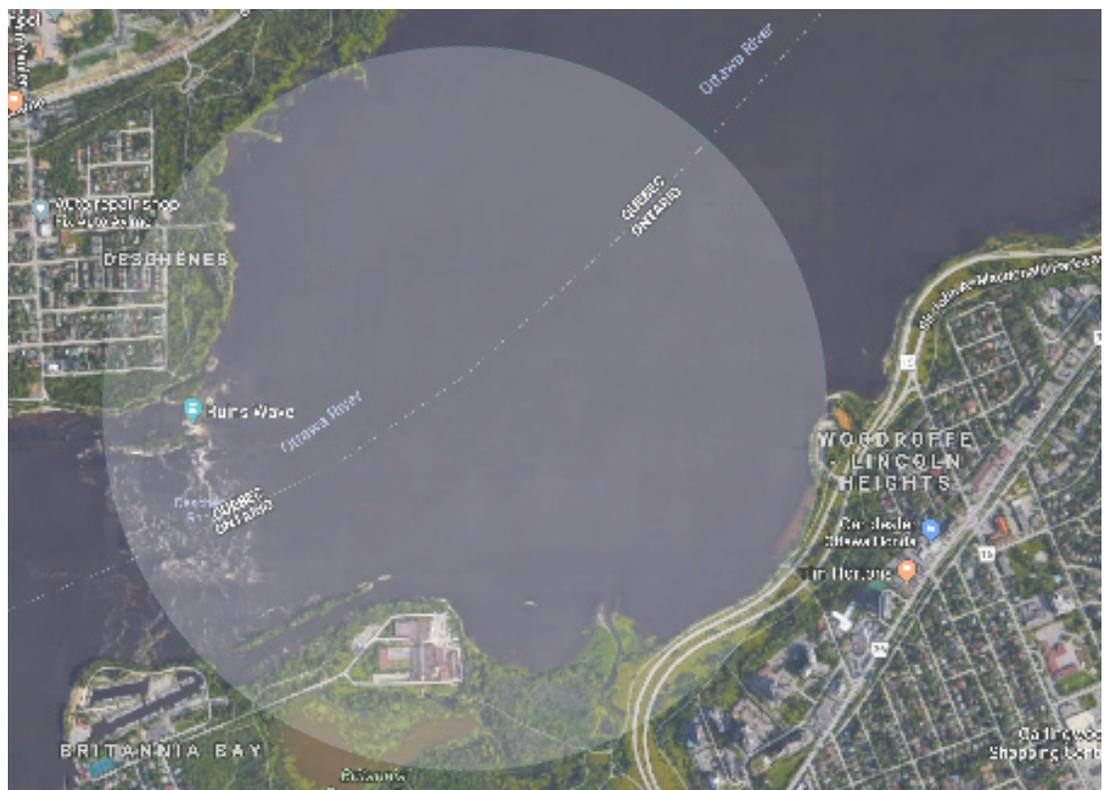
**Fig. 6.1** The Prince of Wales Bridge. Photo by author.

## The *Site 2*

There is a more intimate atmosphere when one walks near Britannia Bay. I felt particularly connected to this area, because of the accessibility of the edge conditions. One can freely walk to the water's edge and find there some recreational facilities and a beach. Thus, this seems suitable for a docking site and use to board into a floating island.

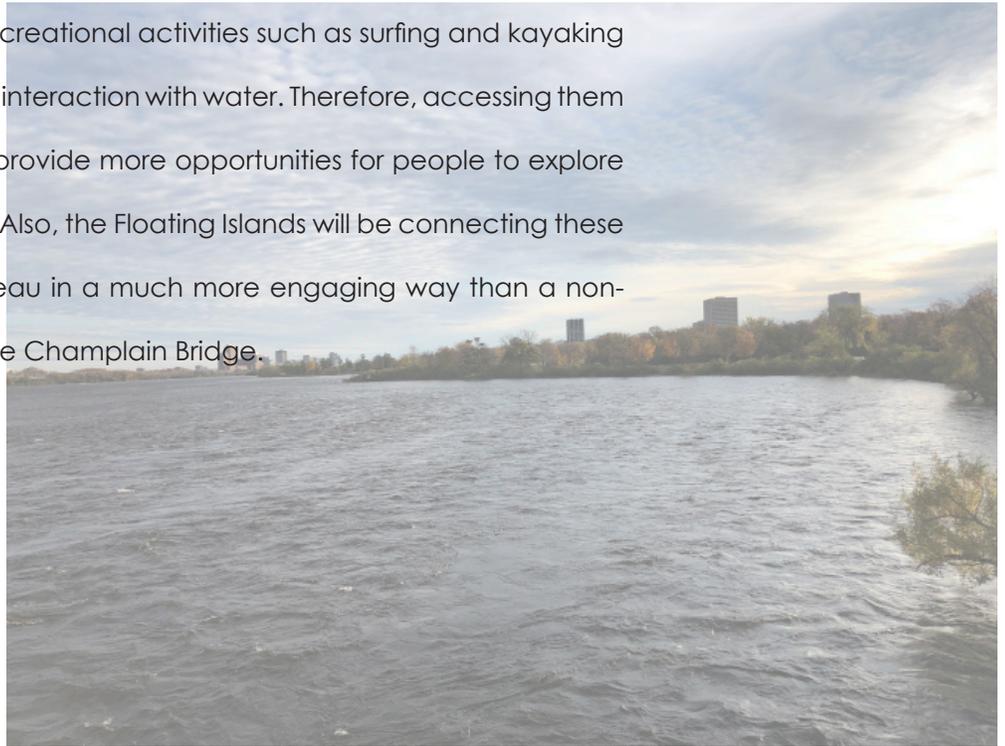


**Fig. 6.2** Above: path along the Ottawa River. Photo by author. Below: screen shot site plan from Google maps.

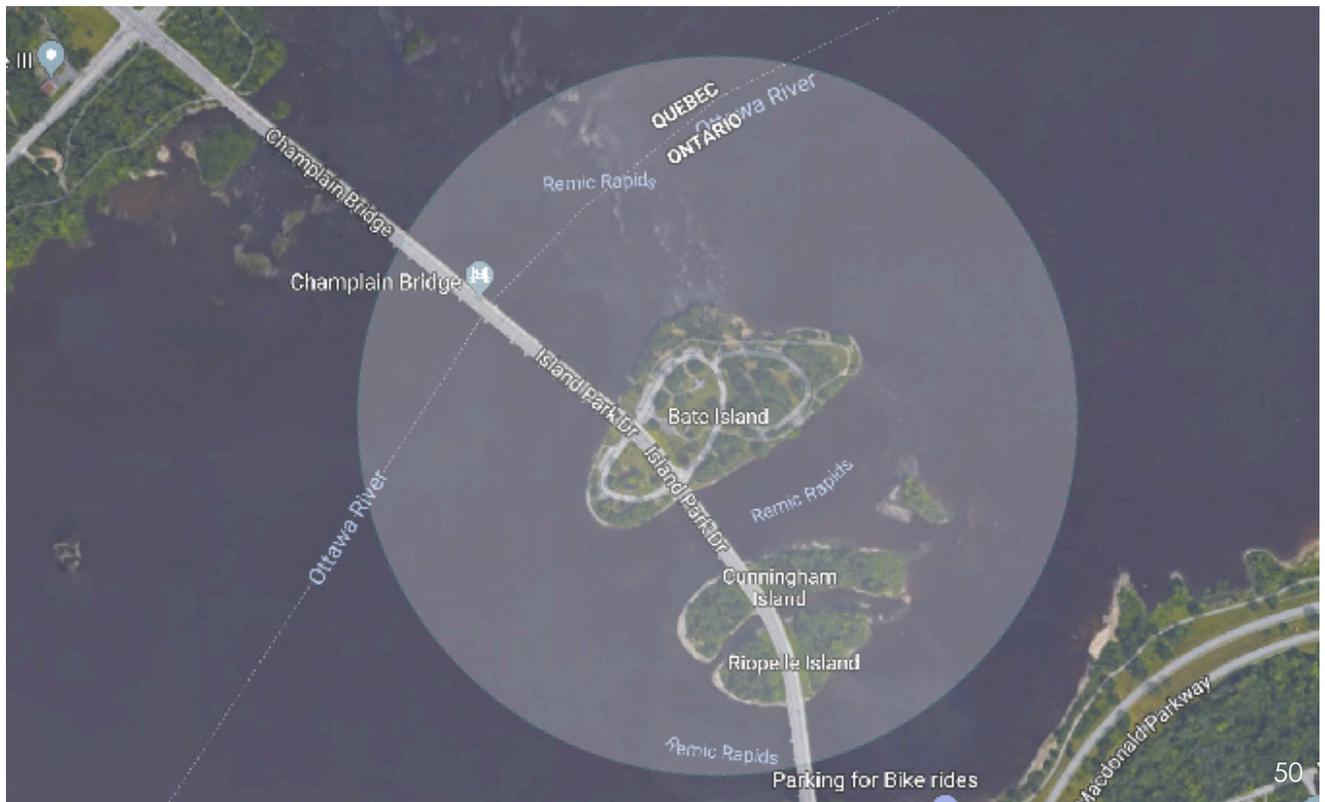


## The Site 3

There are many opportunities surrounding Bate Island, Cunningham Island, and Riopelle Island. Recreational activities such as surfing and kayaking make this area a key place for interaction with water. Therefore, accessing them using the Floating Islands will provide more opportunities for people to explore both the river and the islands. Also, the Floating Islands will be connecting these islands to Ottawa and Gatineau in a much more engaging way than a non-friendly pedestrian path on the Champlain Bridge.

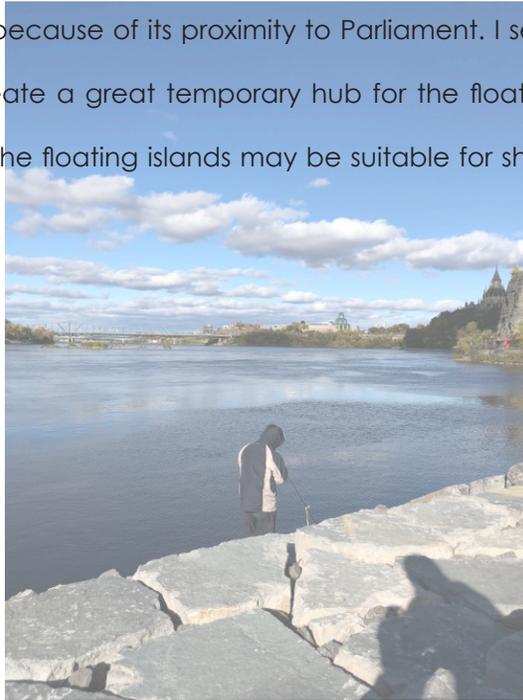


**Fig. 6.3** Above: view facing East from Champlain Bridge. Photo by author. Below: screen shot site plan from Google maps.

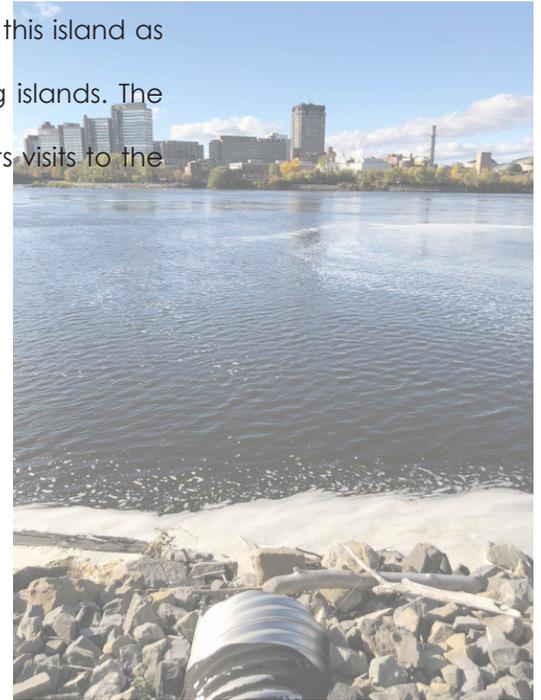


## The Site 4

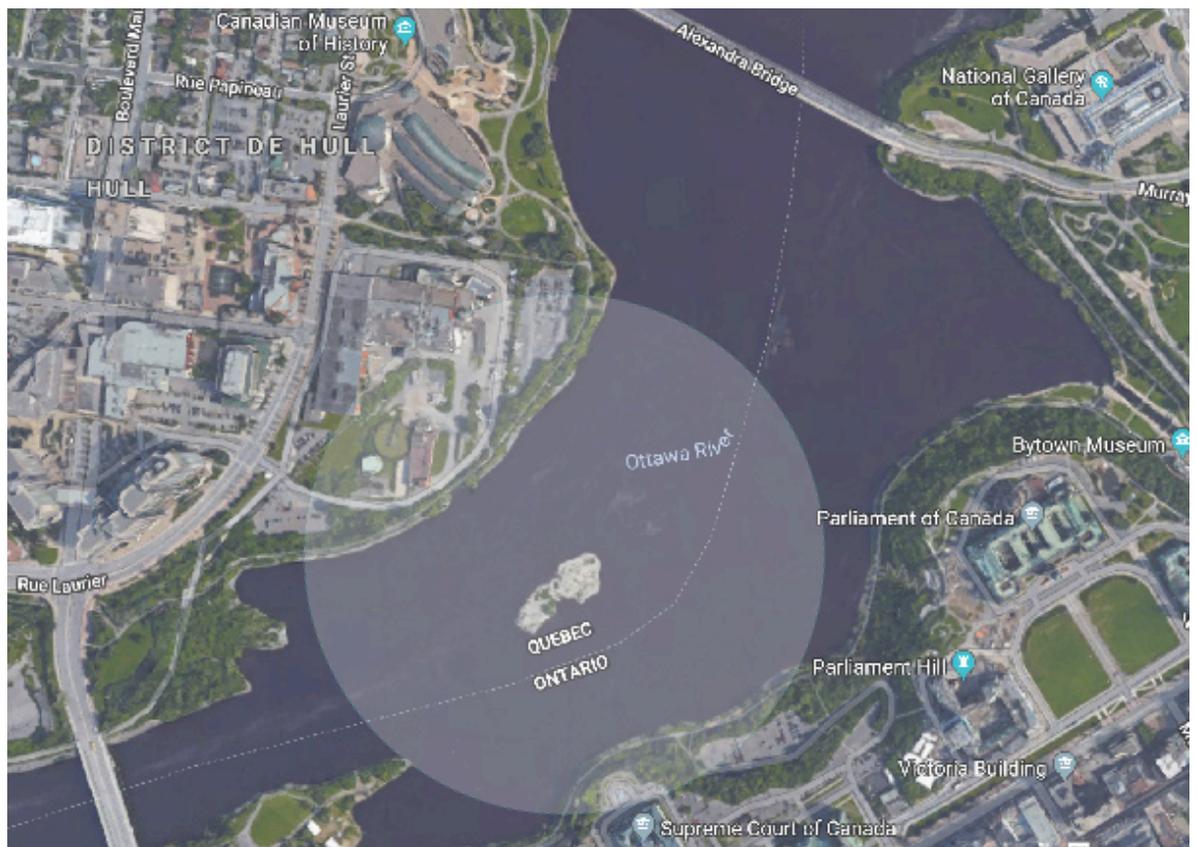
There is an island that exists between Victoria Island and Alexandra Bridge that is unbuilt because of its proximity to Parliament. I see this island as an opportunity to create a great temporary hub for the floating islands. The temporary nature of the floating islands may be suitable for short visits to the island.



**Fig. 6.4** View facing East towards the island.  
Photo by author.



**Fig. 6.5** Above: view facing North Towards the island. Photo by author. Below: screen shot site plan from Google maps.



## Concept & The Proposal

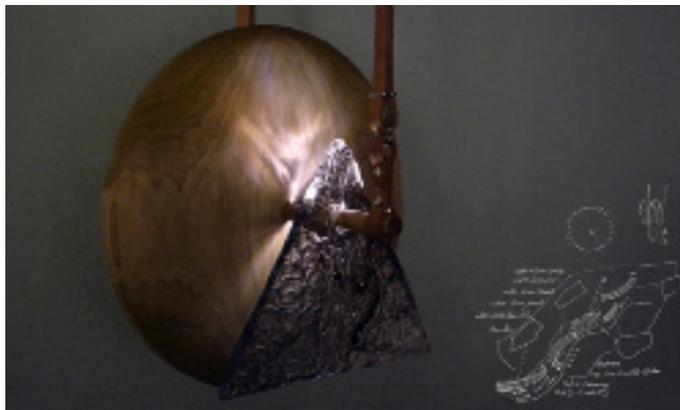
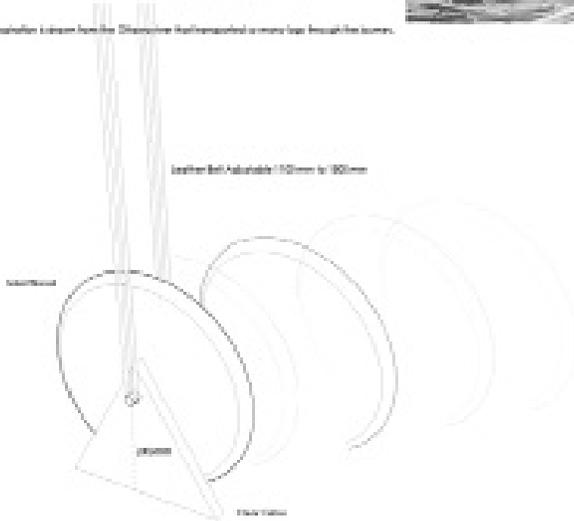
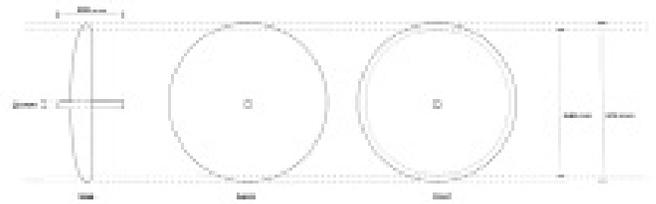
### Voice of the River

I am inspired by the Ottawa River's fluidity and how it is part of a larger watershed. In my opinion, the river is a tremendous generator of motion and a source of life, both human and otherwise. The intention is to consider ways to re-imagine our riverfront for future generations by creating interaction between the people and the river in order to raise awareness about the important qualities of water and its psychological values in our lives. With the desire of bringing more awareness to the river, I believe that in the twenty first century, there is a need to fully understand and have knowledge of not only how to interact with, but learn how to protect the river.

Through my exploration, I designed an interactive installation, (**Fig 7.0**) with the concept to generate of movement as influenced by nature in the Canadian context. The inspiration is drawn from the Ottawa river that transported so many logs through a journey to build homes and goods for Canadian people, and before that by the lives of indigenous people along its sacred waters. Therefore, both the river and wood, as a construction material, play an important role in Canadian culture. The two natural materials are the driving force behind an interactive installation. Glass is chosen as the movement generator for its qualities of solidified liquid, resembling the river, and wood representing Canadian logs moving through it. The circular shape of wood is evoking the shape of a tree trunk. The round wood offers a manual interaction with the user. The motion of the wood serves to adjust the illumination. The manual intervention is used to create a movement that can be interpreted as human intervention sparking that advancement, creating motion and protecting the watershed.



The inspiration is drawn from the 2D landscape that is presented in a more logic through the scenes.



**Fig 7.0** Flow concept model. Model, drawing and photography by author.

In some parts of the world, rafters are still being used for other purposes. In the case of *Bangladesh Floating Gardens*, (**Fig 7.1**) I am inspired by natural man made rafters that can create agriculture lands floating along the rivers. This is an inspiration towards creating positive interactions. An interaction that is the result of dialogue with nature, and working around the natural way of food productions.

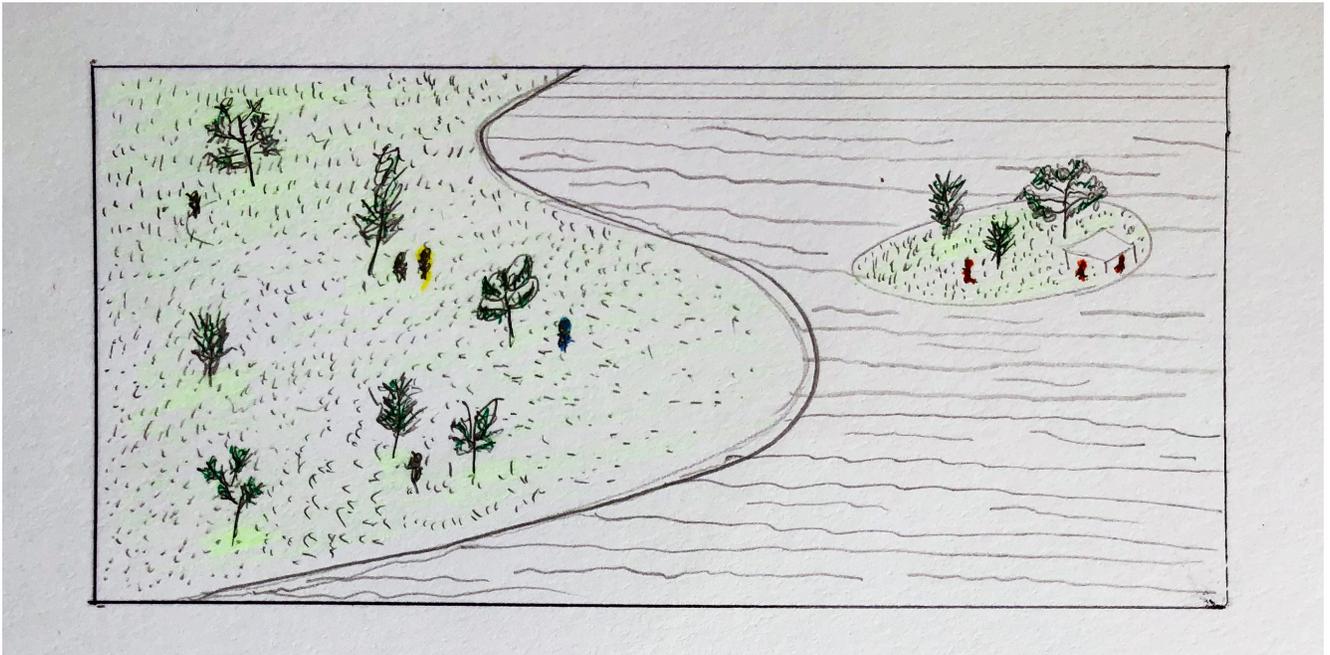
In conclusion, through my interest and having an opportunity to learn from other precedents, I am more inspired to pursue designing a floating island for the Ottawa river. An approach that is inclusive of engagement and giving back. An educational approach that will be part of the engagement and interaction with the river. This will lead to giving back through activities that will help to improve the conditions of the river. Direct group activities such as places for thinking and contemplation, discussions, planting, harvesting, and leisure engagements could be explored. One of the central design strategies for this thesis is the idea of Floating Islands, that aim to become a new element of the Ottawa river watershed. These are a series of accessible fluid movable and flexible structures that promote diversity, education and most importantly interaction. The floating islands celebrate our watershed through collaboration, participation and dialogue. The idea of crossing borders through theoretical and physical obstacles is to provide an opportunity for humans and animals to travel through the river in a steady pace.



**Fig 7.1** *Bangladesh Floating Gardens.*

Photography by Practical Action.

The ability to access the river is relevant to understand parts of the watershed in order to appreciate it. The drawing (**Fig 7.2**) is an initial diagrammatic study, showing the ideas of this thesis. The series of floating islands is not about a specific architectural form but rather they depend on their integration with the natural environment. The first drawing (**Fig 7.2A**) shows the relationship between edge, river, trees and people on the island and land. Second drawing (**Fig 7.2B**), expresses the idea of bridging, and how these islands have the capability to connect people from one side to another side of the river. This concept, will create more engagements along the edge as well. Third, the last drawing (**Fig 7.2C**) is showing a moment when these islands are being in use and they float freely apart from each other in the middle of water. My intention is to design a floating island that is temporary and available to everyone including humans and other habitats of the watershed such as fish species and birds. Hopefully with this approach more conversation will occur between people, and can lead to the creation of a place for thinking, engagement and collaboration. Riverkeeper organization offers a lot of engagements during spring and summer months. They also have a new initiative that focuses on empowering the youth and promoting water youth leadership. The idea is to offer these spaces to youth leaders to propose different themes for each island. Through these islands and themes, they would be able to offer program activities that are unprecedented and unique to the Ottawa river region. For instance, program activities like discovering and learning about fish species through apertures of floating islands (**Fig 9.13**) & (**Fig 9.40**) will offer an higher level of engagement through a collaborative participatory method. This also becomes a great opportunity for all the participants to think deeper about their natural environment. Places for thinking are very important to humans. As technology advances, most people spend less time being exposed to the outdoor environment. This thesis argues that the floating islands are great places for engagement and thinking. A series of islands that the riverkeepers can benefit from, would allow them to promote the importance of the river through a new innovative design.



*Fig 7.2A The Floating Islands. Drawing by author.*

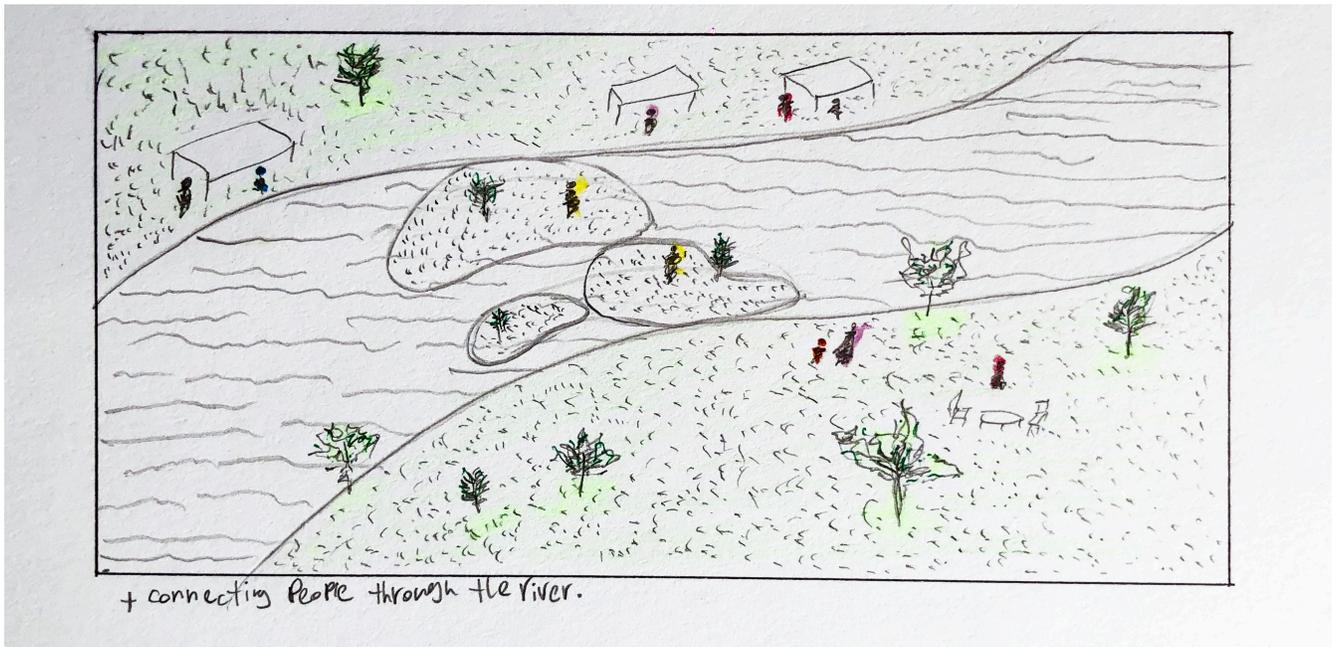
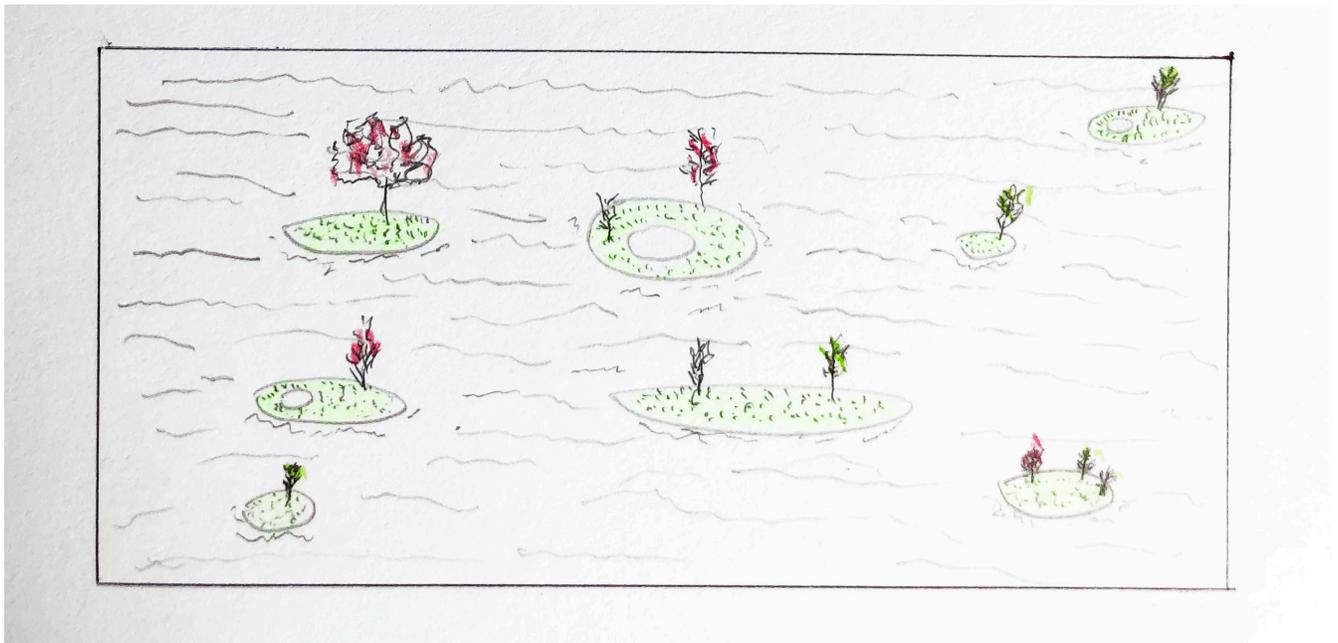


Fig 7.2B The Floating Islands. Drawing by author.



**Fig 7.2C** The Floating Islands. Drawing by author.

The notion of different layers of the Ottawa River during different seasons and different times of the day and night is also fascinating and complex. During a collaborative project with my colleagues, Andrea Tamayo Bernal, and Shannon Clark, who have Urbanism background, we decided to work on conceptual laser cut project with many layers, that would focus on the complexity of the Ottawa river as well as the idea of the floating islands. After finalizing the piece, we decided to project lighting on it with the projector in order to celebrate it by highlighting a motion illumination of it. Furthermore, this conceptual project makes me think of the relationship of fish species under water. Inspired by the colours of sunset and sunrise (**Fig 7.3**), I also think about the illumination of the floating island during a certain time of the day or night.



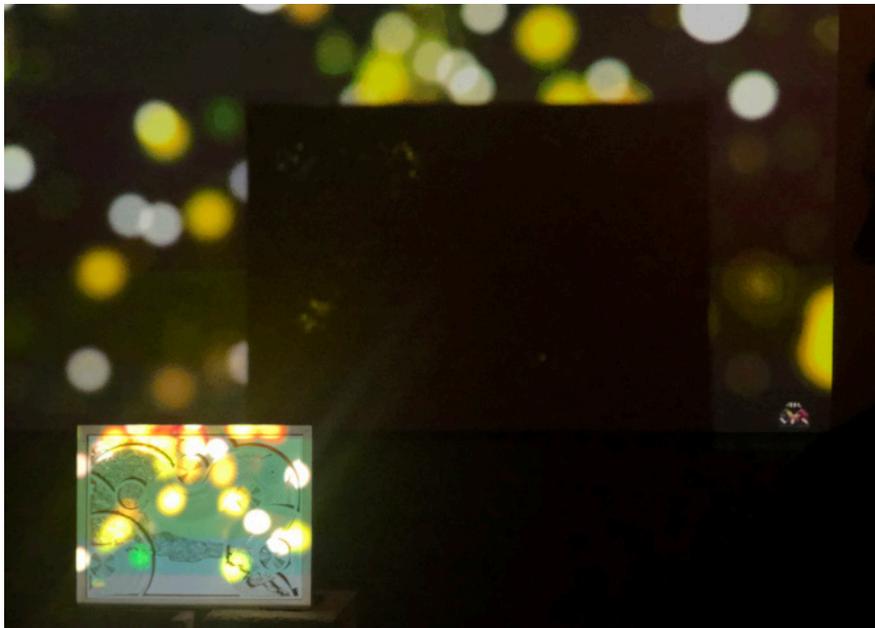
**Fig 7.3** The sunset time by the river. View from The Royal Canadian Geographical Society facing Ottawa river and Ruisseau de la Brasserie in Gatineau. May 2019. Photo by author.



**Fig 7.4** Details of the model. A collaborative project by Hamid Aghashahi, Andrea Tamayo Bernal, and Shannon Clark. Photography by author.



**Fig 7.5** Illuminating the model. A collaborative project by Hamid Aghashahi, Andrea Tamayo Bernal, and Shannon Clark. April 2019. Photography by author.



**Fig 7.6** Illuminating the model to get an essence of sunset or sunrise. A collaborative project by Hamid Aghashahi, Andrea Tamayo Bernal, and Shannon Clark. April 2019. Photography by author.

## River Transformations

### Voice of the River

I am inspired by natural human made rafts that can create agriculture lands floating along the rivers. This inspiration comes from Bangladesh Farms and from how Bangladeshi people work with nature to create floating architecture. Their interactions are based on creating a source of food from these floating farms. An interaction that is the result of a direct dialogue with water, and working around the forces of water to plant and harvest food. The constructed intervention happens every year, and also all year long. According to BBC, "Bangladesh is home to the world's largest river delta and prone to frequent, devastating flooding. Farmers here are expanding an ancient technique of building floating farms that simply rise and fall with the swelling waters."<sup>34</sup> This idea offers an important task for food security, and in times of rising sea levels, could this offer a solution?

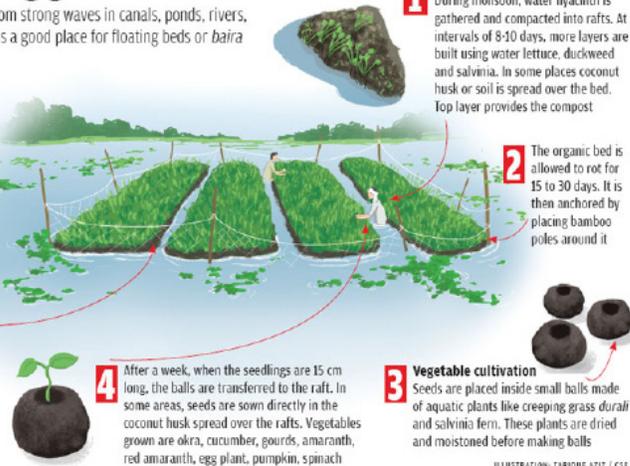
The Bangladesh Farms made me to think more about our history (Fig 7.1). During my further research about Canadian First Nations, I learned how they were adapting to the nature through their techniques. They were able to harvest "food that grows on water" or wild rice (*Zizania* sp.) also called "Manomin" that is a traditional food of *Anishinaabe* people (Fig 8.1). The notion of traditional Indigenous foods along the edge conditions of the Ottawa River where wetlands species live is a fascinating starting point for me.

### How floating gardens are created

Still water protected from strong waves in canals, ponds, rivers, lagoons and wetlands is a good place for floating beds or *baira*

**6 Winter crop**  
When floodwater recedes in late autumn, the platforms are broken, mixed with soil and gardening plots are prepared on land

**5** Vegetables are harvested, while seedlings are used for early cultivation of the winter crop



**1 Bed preparation**  
During monsoon, water hyacinth is gathered and compacted into rafts. At intervals of 8-10 days, more layers are built using water lettuce, duckweed and salvinia. In some places coconut husk or soil is spread over the bed. Top layer provides the compost

**2** The organic bed is allowed to rot for 15 to 30 days. It is then anchored by placing bamboo poles around it

**3 Vegetable cultivation**  
Seeds are placed inside small balls made of aquatic plants like creeping grass *durali* and salvinia fern. These plants are dried and moistened before making balls

ILLUSTRATION: FAROQUE AZIZ / CSE

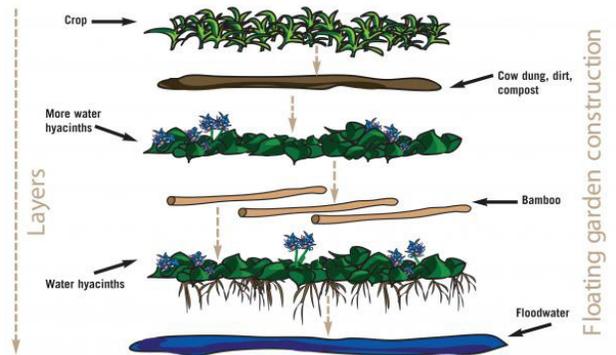


Fig 8.0 Diagrams of Floating Islands. By Practical Action.

Harvesting and processing Wild Rice has been an important source of food in the past and now for indigenous people in Canada (**Fig 8.1**) & (**Fig 8.2**). There are two main species that have been traditionally used as food: *zizania aquatica* (or *palustris*) and *zizania aquatica angustifolia* that seems to have grown over a large portion of North America, but was disturbed because of the influx of European settlers, and how they effected the seed beds near the lake shores.<sup>29</sup> Looking at the process of harvesting that is called “manoominikewin in Ojibwa” or ricing, certain tools and methods stand out, and I would like to acknowledge them as source of inspiration for designing the floating islands:

- A.** The notion of community involvement,
- B.** Domestication and local harvesting,
- C.** Role of indigenous family culture and how women and men collaborated together to seed and harvest,
- D.** The methods of “Binding the Rice” as well as the tools that were used for harvesting the rice, methods of knocking and Drying the rice.

Therefore, I believe that more opportunities should be available for all people residing along the Ottawa river to seed and harvest local food.

29 Native Art in Canada: “Harvesting and Processing Wild Rice.”



**Fig 8.1** Indigenous members harvesting.  
Photo by *Native Art in Canada*.



**Fig 8.2** Indigenous members harvest wild rice by hand from canoes each fall.  
Photo by *Indian Country Today*.

I believe that in working with water and nature, we should also think and consider to re-introduce the edge conditions of the Ottawa River to all species and animals. Taking inspiration from the nests floating on water, I would like to create a floating architecture that can invite most birds and animals to live in that habitat. In Albania and Montenegro, floating nests designed on rafts may save one of the World's Largest Water Birds known as Dalmatian Pelican (**Fig 8.3**). The rafts are designed so they can withstand floods.<sup>30</sup> Similar floating nests have been also seen around Changbai Island in Northeast China's Jilin Province (**Fig 8.4**), where caregiver Ren Jianguo made seven nests that float for non-swimming water birds that feed on the margins of lakes, rivers, swamps, ponds, and the sea.<sup>31</sup> The Ottawa River region is a hub for many birds and animals. I believe that as a designer, I have an important task to bring awareness to the wetlands and trees that were destroyed during fur trade and timber extraction of lumber industry. It is important that we seed where we harvest. This is a task that has been practiced throughout centuries by aboriginal communities around the world, especially in the Ottawa River region. The loss of trees and wetlands had a high impact on all the species of birds and animals. Back in the in 1970s, there were many more birds in the Canadian forests and parks near the Ottawa region singing everyday.<sup>32</sup> Thus, I question how can we prevent these songs to not be lost for our future generations?

30 Rojo 2015: "How Floating Nests May Save One of the World's Largest Water Birds".

31 Chinadaily 2013: "Floating nests help water birds thrives".

32 Mroz: A conversation with her about her memories.



**Fig 8.3** A floating platform in Skadar Lake entices pelicans to build their nests here, protecting them from floods. Photo by *Smithsonian*.



**Fig 8.4** Heron family on a floating raft  
Photo by Chinadailey.

Exploring around the ideas of the edge conditions of rivers, I learned about the *Chicago River Edge Ideas Lab* and how nine leading architecture firms share their visions to reinvent Chicago's second coast.

*"These ideas demonstrate innovative concepts for placemaking and how to create a continuous and accessible pedestrian and bicycle path with integrated open spaces along the Chicago River edge. The City encourages Chicagoans to examine the ideas and share their opinions about the best and most engaging concepts. Ultimately, the ideas and public input will inform a set of river edge design guidelines applicable to future development projects along the Chicago River."*<sup>33</sup>

There are a lot of interesting ideas put forth by these firms. According to the Chicago River Lab,

*"Three iconic sites were chosen because of their typical condition throughout the city's river system: a building edge, an open space edge, and a bridge edge. Each condition has unique challenges in providing an activated and unified river walk system."*<sup>34</sup>

This approach of many conditions and sites, brings inspiration to my thesis and makes me think about the importance of multi-functionality of the floating island. What transformations it needs to take when it goes from one part of the river to another part. The project of "Living in the River" with Adjaye Associates, is the closest one that resonates to the idea of floating islands (**Fig 8.5**). It is the notion of using the water way that helped to form the infrastructure, and to use it for interactions and pleasure. In one of their schemes, floating vessels move people across the river. However, I argue, they are essentially just boats, and they do not favour other species.

33 Chicago River Lab: "Nine leading architecture firms reinvent Chicago's second coast".

34 Ibid.

**Fig 8.5** *Living in Water* proposal by Adjaye Associates. Photo by chiriverlab.



There are many architecture and urbanism firms in Chicago that are trying to educate the public. In particular, the work of Moss *architecture design green* and the Chicago River Habitat Restoration and their idea of Floating Garden Islands is of importance to this thesis. A project started in Summer 2015, in collaboration with the Naru Project for Chicago River Kayak Park that “would spark a recreational revolution on a neglected portion of the Chicago River.”<sup>35</sup> They proposed amenities such as performance stage, a floating pool barge, easier inroads for kayakers to get up close to vegetation and wildlife (**Fig 8.6**). Their “mussel-inspired” idea of plants growing on the river sans soil to improve the lives of wildlife is unique. Their approach helped to get people involved along the edge conditions, helping the fish populations to grow, and based on their documentation, the following species have been observed using the gardens:

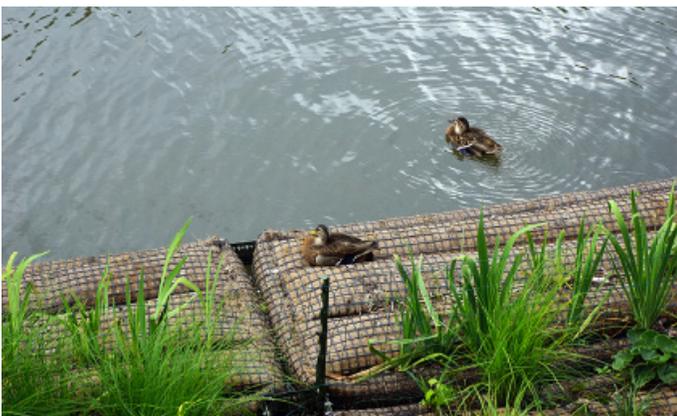
**Fish** – bluegill, largemouth bass, common carp, tadpole matdoms, spotfin shiners.

**Birds** – mallard ducks, wood ducks, cormorants, great blue herons, Canadian geese, American coots, English Sparrows.

**Invertebrates** – monarch butterflies, small white butterflies, dragonflies, damselfies, bumble bees, honey bees, ladybugs.

Therefore, this precedent allows me to understand the direct relationship of an organic ecological design for along the river. Also it motivates this thesis to focus more on diverse range of users.

35 Torem 2017: “CHICAGO RIVER HABITAT RESTORATION: FLOATING GARDEN ISLANDS UPDATE”.



**Fig 8.6** Floating garden island

Photo by moss:architecture:design:green.



**Fig 8.7** Floating garden island

Photo by moss:architecture:design:green.

When it comes to designing an architectural space for users, the idea of large scale is something that I am always fascinated by. However, in term of the Ottawa River, I am aware that no matter how vast it is, I need to start at a small scale and allow the project to grow gradually. The floating theater of the world (Venezia Teatro del Mondo) is the notion of temporary fluid architecture on the Venitian lagoons. The floating "theater of the world", was designed by Vincenzo Scamozzi for the coronation of the dogaressa Morosina Grimani in 1593.<sup>36</sup> Later this idea was introduced by Aldo Rossi for the Venice Biennale in 1979. According to Rossi, "monuments" are examples of types within cities that are places where memories are stored and the history of architecture can be learned.<sup>37</sup> In other words, he understood cities as places for human events and this floating architecture created a new interpretation of memories traveling through the city. Comparing this to the Ottawa river, I have noticed that there have been areas along the river that lack attention. There are nodes that people can not access because they are owned by certain organizations. **(Fig 8.10)** There are places that people want to visit to experience the atmosphere and the sense of place, but they cannot reach. I argue that, floating islands should celebrate these moments and places by creating opportunities along the river to allow for memories to be made.

36 Barbarano 2004.

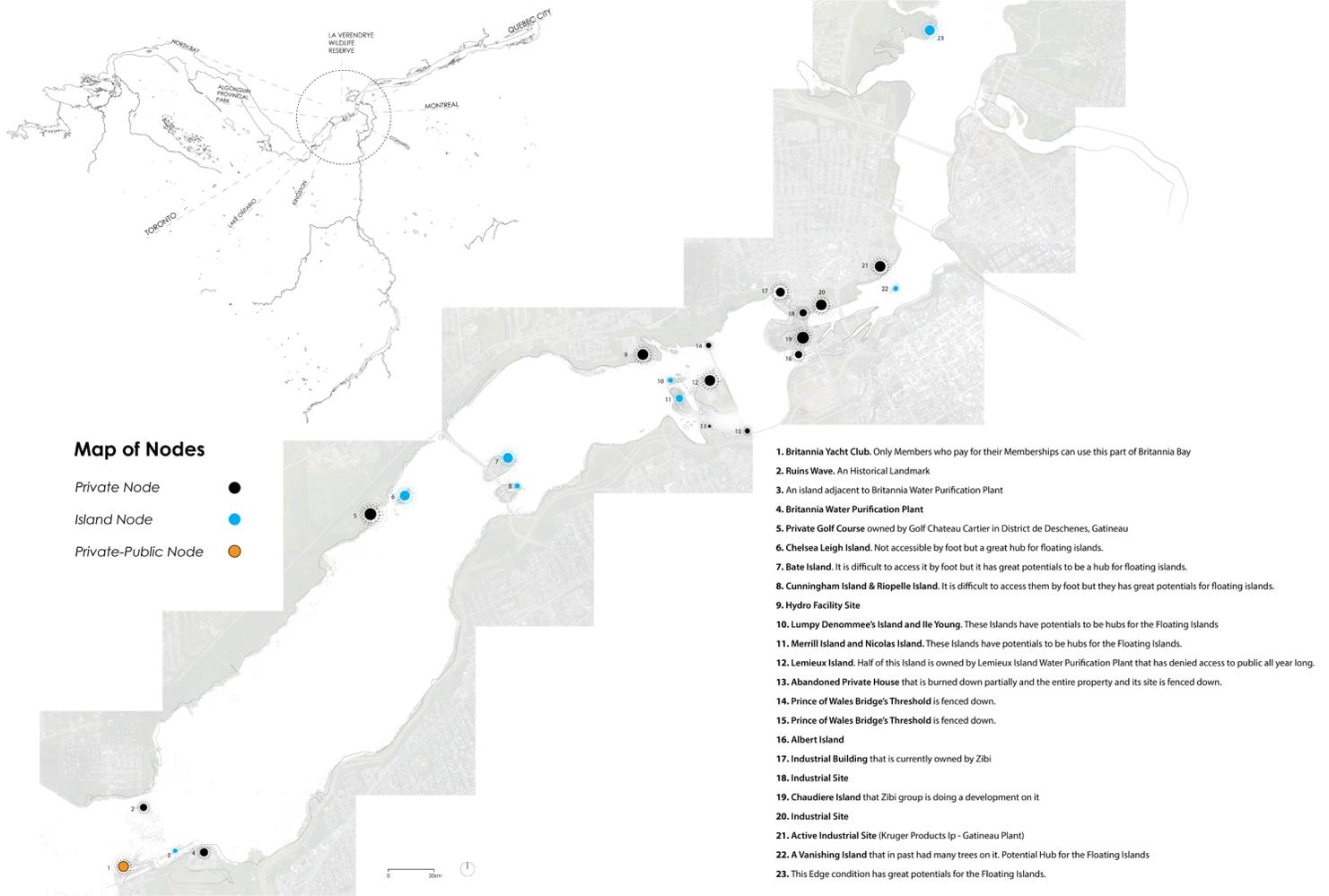
37 Lowrey 2015: "Historical Influences of the Teatro del Mondo".



**Fig 8.8** Floating Theater of the World.  
Photo by Palladio Museum.



**Fig 8.9** Aldo Rossi, Theater of the World, 1979. image courtesy of La Biennale di Venezia.



**Fig 8.10** Map of Nodes. Ottawa River. Drawing by author.

Reading into the history of the Ottawa river, teaches that the river has always been a main transportation highway, for first nations and then later the European settlers. Bridging between two geological sides had been always done with vessels like canoes and wood rafts.

*“Bouchette, the Surveyor-general for lower Canada, received on May 29, 1824, an order from the Governor, Lord Dalhousie, to proceed without delay to a tour and a report on the new establishments in the townships of Lower Canada on the north shores of the banks of the St. Lawrence and Ottawa Rivers. This, in order to verify and make recommendations upon the observed situations”.*<sup>38</sup>

Based on his observations, in order to improve the spirit of enterprise of these regions, he brought attention to “the opening of Canals, and the erection of bridges, which must materially facilitate their mutual commerce. From that time on, and even today, the question of bridges over the Ottawa River would be of constant concern to the people of this region”.<sup>39</sup>

I see the Floating Islands as a new vision connecting both geological sides while celebrating the water as the main connection source providing access to these nodes (**Fig 8.10**). Perhaps this is going back to the traditions of the Indigenous people of Canada, whose vessels and canoes were not only moving people from one side to another side, but were also creating direct interactions between humans and water.

38 Brault. "Links between two cities".

39 Ibid. The First Union Bridge.

*The Floating Piers* by artists Christo and Jeanne-Claude present a large scale constructed intervention. This 3 km long and 16 m wide pathway was made of 220,000 high density Polyethylene cubes with 100,000 sq meter colored nylon fabric that took place after many years of planning in Lake Iseo, north of Milan for two weeks in June 2016 (**Fig 8.11**). Christo explained his experimental art as follows:

*"Like all our projects, The Floating Piers was absolutely free and open to the public [...] were an extension of the street and belonged to everyone."*<sup>40</sup>

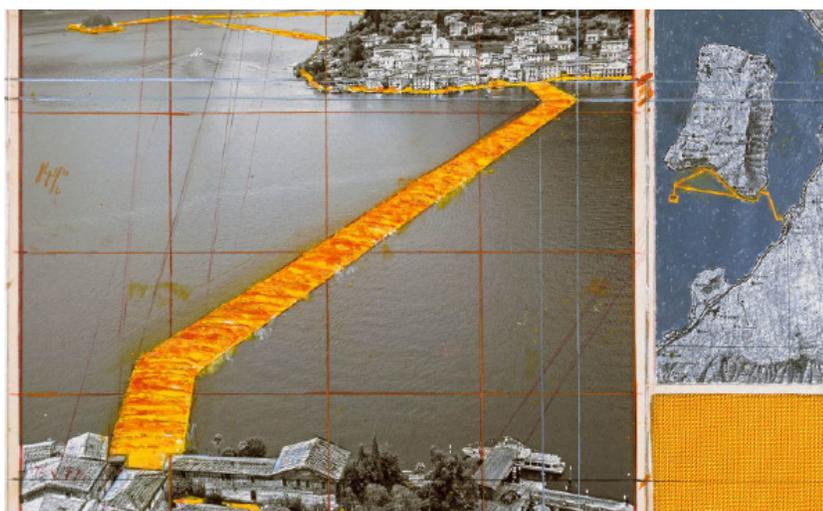
I am inspired by the simplicity. Moreover, Christo mentioned

*"Those who experienced The Floating Piers felt like they were walking on water – or perhaps the back of a whale[...] The light and water transformed the bright yellow fabric to shades of red and gold throughout the sixteen days."*<sup>41</sup>

*The Floating Piers* is a great inspiration for this thesis in terms of scale and in terms of its program. I argue, great projects took a long time to get realized, but offered something that is very sensory. In this case, what I appreciate is the notion of a place to walk, get exposed to water, get engaged, interact and have a dialogue with others. The continuous flows of people is what makes me motivated to design the floating islands along the Ottawa River.

40 Christo Jeann Cloud 2016: "The Floating Piers".

41 Ibid.



**Fig 8.11** *The Floating Piers*.  
Photo by DIVISARE.



**Fig 8.12** *The Floating Piers.*

Photo by Wolfgang Volz © 2016 Christo.

Through investigation around the idea of a pedestrian centered bridge over a body of water, I am inspired by Ponte del Redentore in Venice as a historical intervention. The aim is to analyze the importance of it in this thesis, because their gesture in dealing with the water is unique and I would like to raise awareness to consider looking at the human scale and modularity of these vessels creating a continuous platform for humans to walk.

### **Ponte del redentore venezia**

During the *Festa del Redentore*, which is held on the third Sunday of every July in Venice, people gather with the purpose of giving thanks to the end of a terrible plague of 1576, which killed 50,000 people. Preparation usually begin in the morning where people begins decorating their boats, and a bridge of barges starts to get built connecting the Guidecca island to Venice.<sup>42</sup> According to VENEZIATODAY,

*“Everything is ready for the inauguration of the votive bridge of the Redeemer 2018. The structure, built by Insula, will be 4.6 meters wide and supported by 34 boats. The laying of the modules began on 2 July and will end on Saturday”.*<sup>43</sup>

This is an incredible ceremony that underlines the importance of cultural heritage. I see this event, as an opportunity of connecting everyone in the city. A day of joy for everyone participating in it. Therefore, the idea of a continuous flow like a bridge is a great opportunity to be an instigator. This creates a strong dialogue between the natural and the human-made, unified by the notion of a temporary and fluid bridge.

42 Citta di Venezia 2017: “Festa del Redentore 2017”.

43 La Redazione 2018: “Tutto pronto per l’inaugurazione del ponte votivo del Redentore.”



**Fig. 8.13** The pier that connects Giudecca with Venice during the Festa del Redentore in July 2009. Photo by Aisano.

This is a bridge that is made of many modules, which vibrates because of the water moving under it when people walk on it. This represents a successful project that inspires my design proposal and the idea of floating islands. I believe that a respect for nature is simply shown here through this project. It is expressed in the notion of leaving no footprint on the water and the edge conditions. The notion of many canoes or vessels making this possible is inspiring. What if every Canadian in the Ottawa River region can experience walking on it in order to connect to each other and nature in a unique experimental way. What if this idea becomes the instigator for more visitors from across the nation? These are certainly some of my thoughts and imaginations that are considered as potential solutions for connecting from node to node along the Ottawa River. When I look the photo (**Fig. 8.14**) where everyone is walking on the path, with peace and joy, explains why I wish for this.

In my opinion, a series of floating islands can offer something beyond just passing, which is the idea of spending time over the river. The notion of a small park along the riverscape creates a different dialogue with people (**Fig 9.28**). It offers something that every fluid city has been aiming to do. It offers an opportunity for people to relax and understand the bodies of water more. It offers a sense of ownership, a sense of sensorial engagement with space.



**Fig. 8.14** "From the pontoon bridge during Festa del Redentore (2006)". Photo by Creative Commons.

## **The Floating Islands**

### Voice of the River

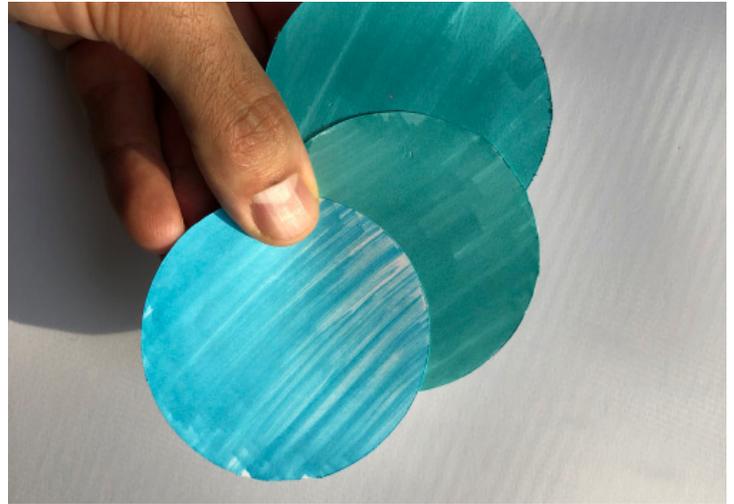
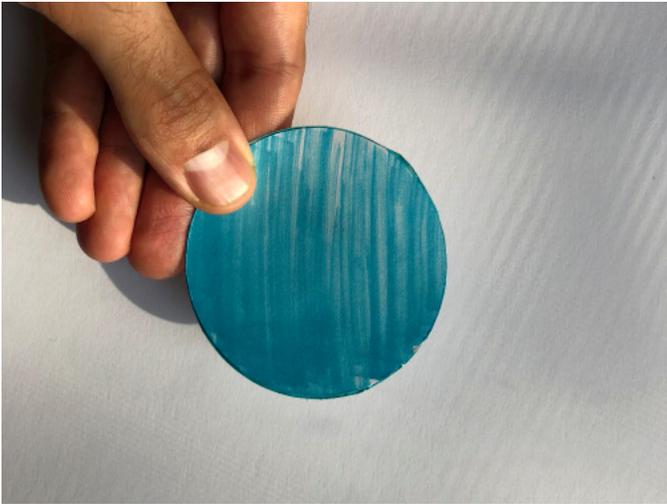
Inspired by riverkeepers, I learned from their staff, volunteers and everyone who attended their events. I would like to dedicate the program of *The Floating Islands* to them. They recently launched their Youth Program and I would like to focus my project on the youth to be more engaged and protect the environment. Therefore, investing on youth is an important factor for this thesis. Working with them in the past, I know they are capable to carry the message forward. They are the ones who need an opportunity to grow.

*The Floating Islands* aims to create opportunities for interactions, collaborations and dialogue between all users. Especially a direct learning experience between humans and other species **(Fig 9.46)**.

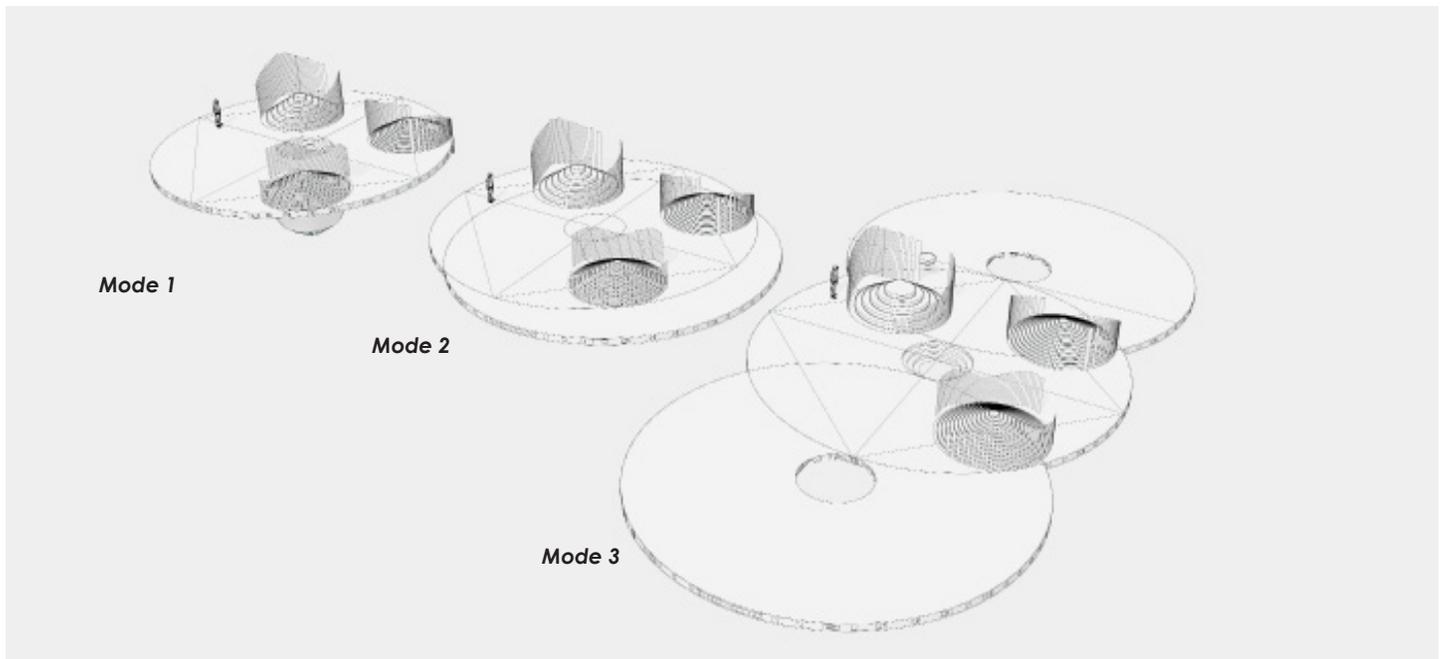
*The Floating Islands* is a place to teach, support the animal life, and essentially support the Riverkeepers to protect the Ottawa River Watershed. The idea is that small modules can work individually as well as a unified group. The following drawings and photographs demonstrate the stages of explorations.



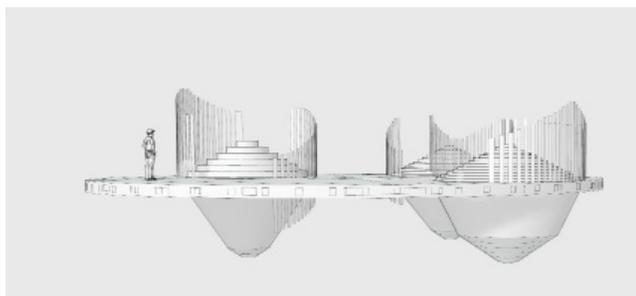
**Fig 9.0** *Imagining The Floating Island.*  
Mixed Media by Author.



**Fig 9.1** Imagining different modes for *The Floating Island*. Model and Photo by author.

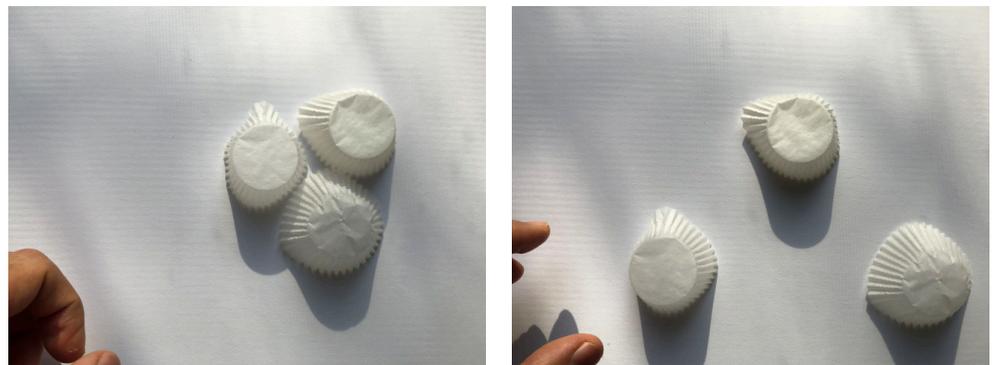


**Fig 9.2** Imagining different modes of *The Floating Island*. Drawing by author.



**Fig 9.3** Imagining *The Floating Island*. Drawing by author.

Inspired by sailboat along the Ottawa River, I am thinking about controllable a canopy similar to a roof. A canopy that is based and created from a circular shape. The reason that I chose the circular shape as a base is because it is organic and unified from all sides. The following image (**Fig 9.4**) is the result of a folded pattern that was the starting point for more explorations. In this geometry, I was capable of expanding and closing the canopy, very simply.



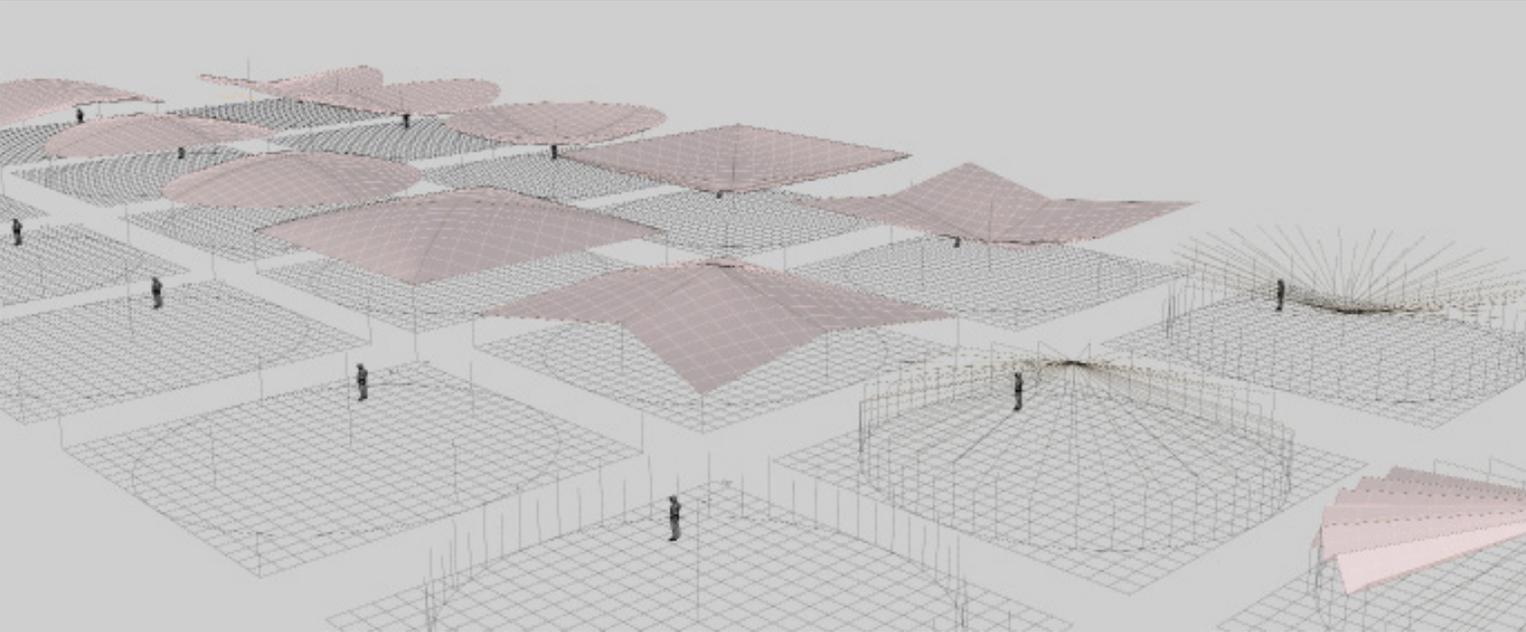
Imagining *The Floating Islands*. Together versus individually. Photo by author.



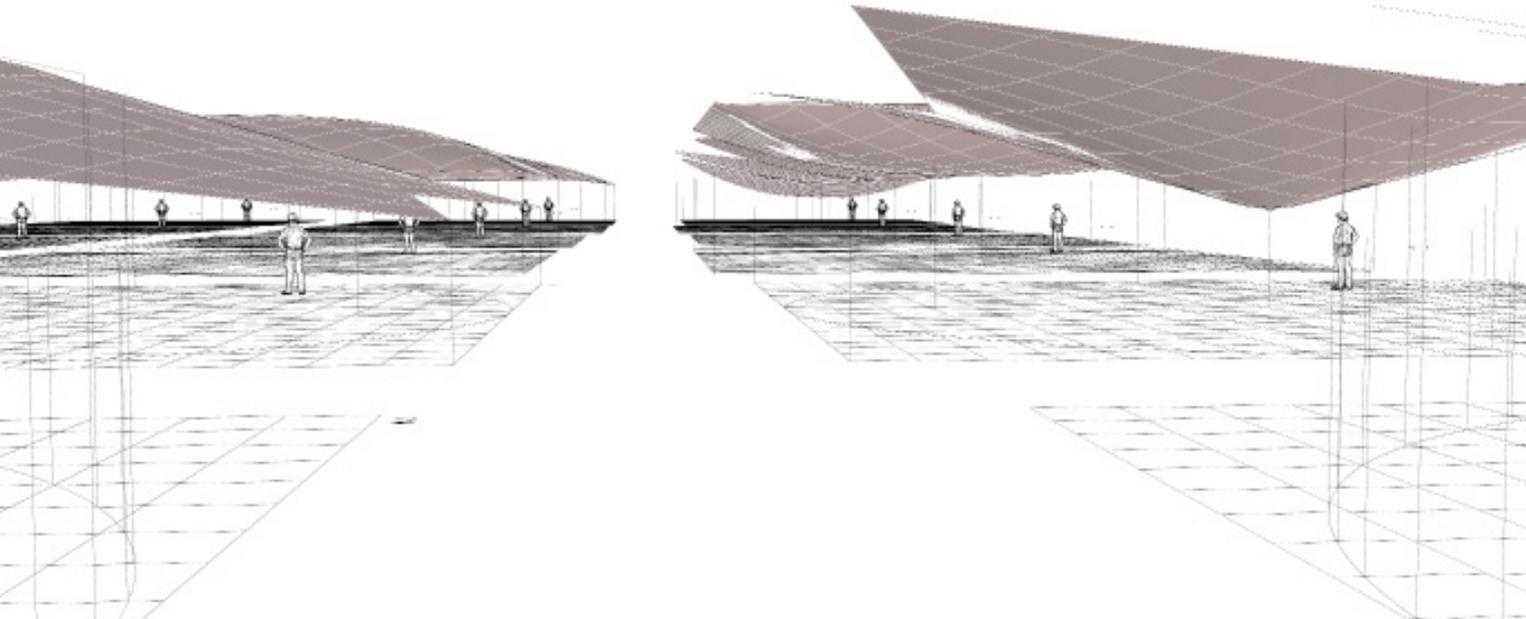
**Fig 9.4** Imagining *The Floating Island* with a concept of roof.

Model and photo by author.

The following images (**Fig 9.5**) & (**Fig 9.6**) are the results of this exploration modeling in CAD. The rows on left are flipped 180 degree to create an upside down canopy on the right, resulting is an interesting form that can be used as the floating base on the water.



**Fig 9.5** Imagining *The Floating Island* through explorations of series of roofs based on circular bases. Drawing by author



**Fig 9.6** Imagining *The Floating Island* through explorations of series of roofs based on circular forms. Drawing by author

I explored modeling many physical models with my hands using light materials in order to find opportunities to contribute to my concept. The results were never ending, but It helped me to think about important points that really matter to the thesis: lightness and dynamic. In that sense, the models below, explains the important phases of the process. Process of making goes hand by hand with the process of thinking. The ideas that emerge from combining these two is what makes this thesis powerful.



**Fig 9.7** *The Floating Island Process.* Model by author.



**Fig 9.8** *The Floating Island Process.* Model by author.



**Fig 9.9** *The Floating Island* Process Models and photography by author.



**Fig 9.10** *The Floating Island Process Models* and photography by author.

Meanwhile, it is important to cross reference the sites of the thesis. I believe that the Floating Islands move in between a series of sites along the water. They must be free. They are guided by the Riverkeepers staff for safety reasons.

The following map (Fig. 9.11) suggests which zones the Floating Islands are located in, and which paths they will take. The floating islands are a means to provide access where it has been denied. The potential of the island is to provide new kinds of access or inhabitation of the river. The floating islands promote a dynamic space that is flexible to move along anywhere along the river (Fig 9.12). This thesis argues that an edge is constantly changeable and should be free and accessible to all. Therefore, an edge cannot be owned and it needs to be celebrated.

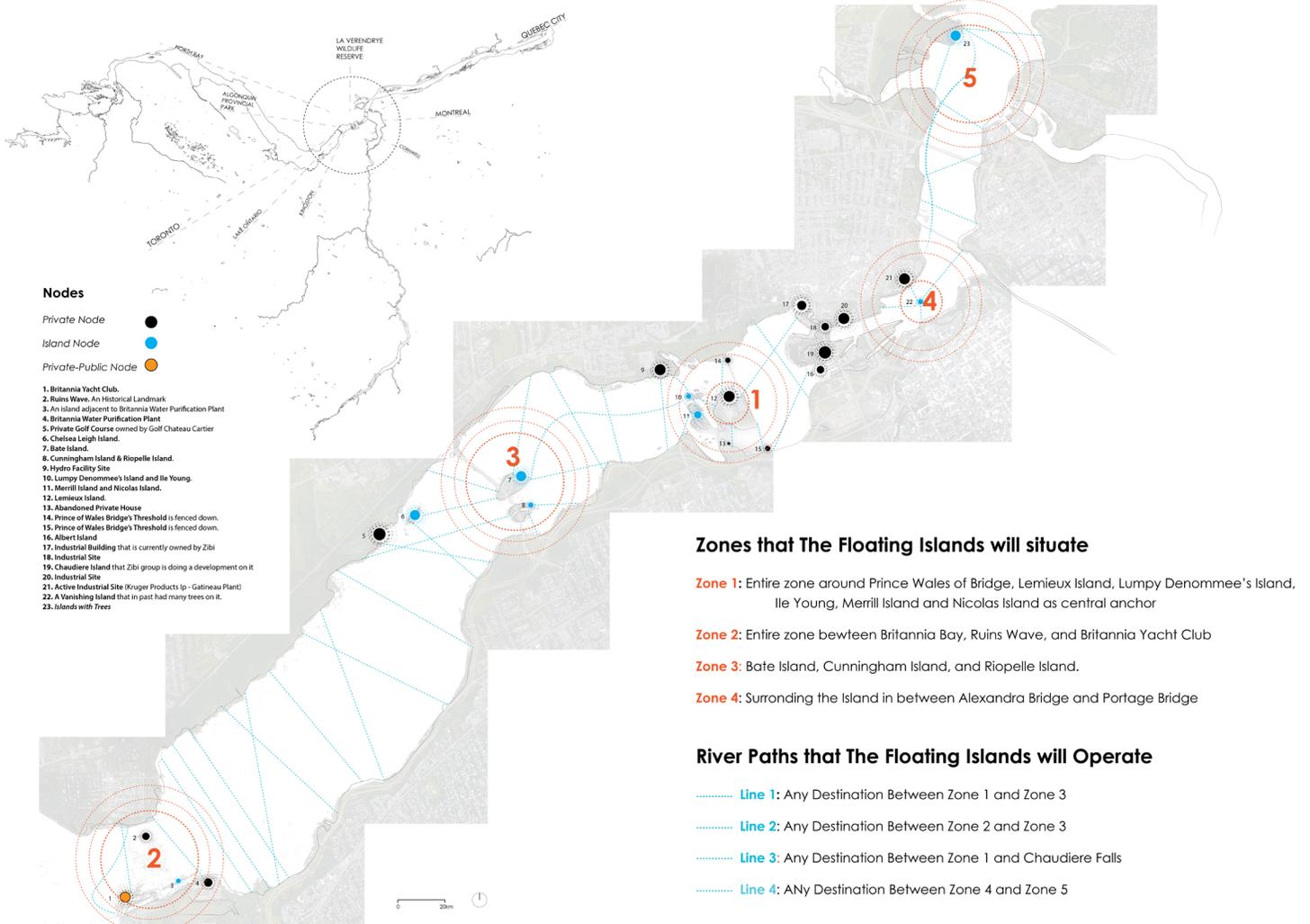
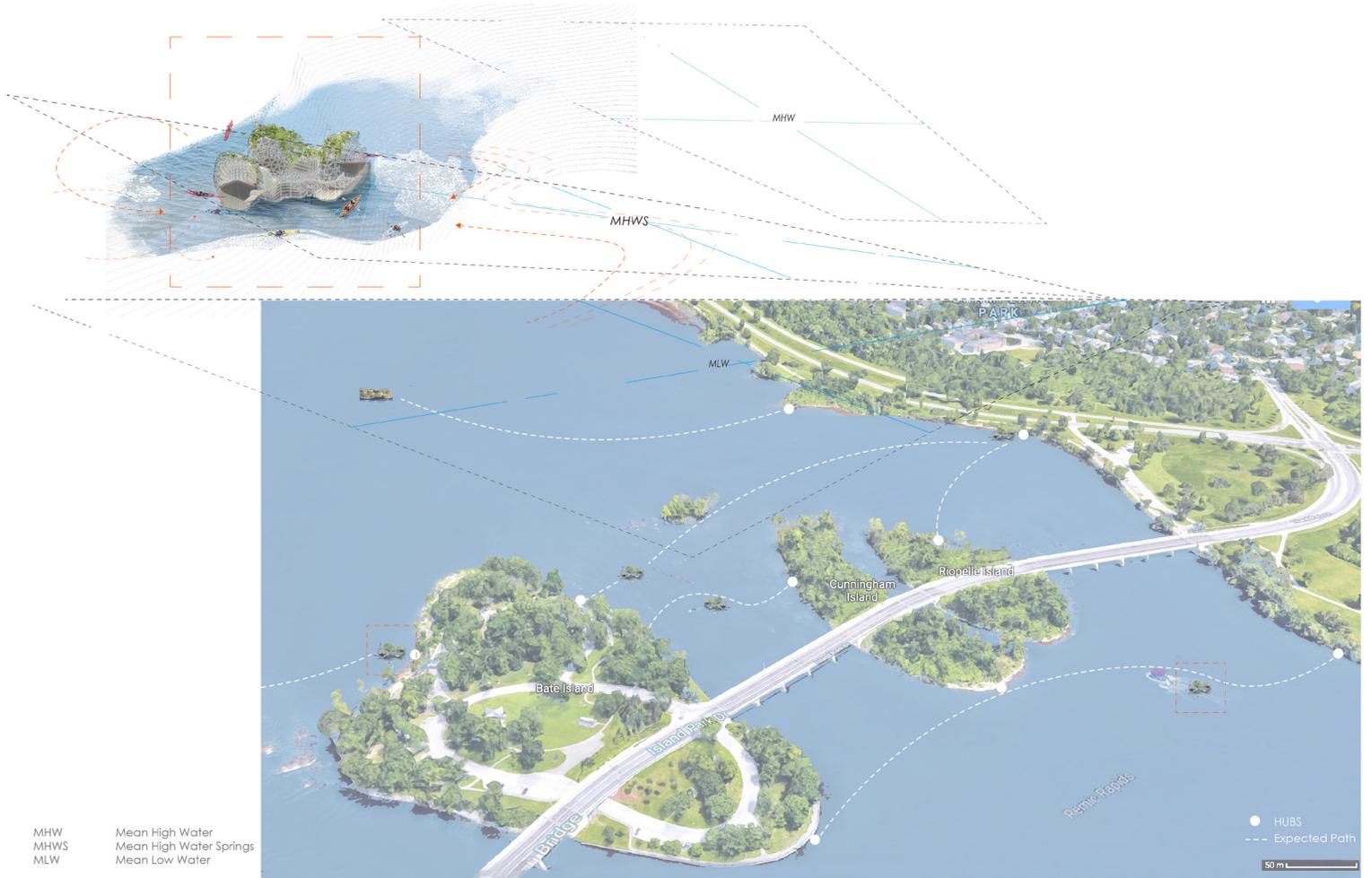


Fig 9.11 Map of The Floating Islands. Ottawa River. Drawing by author.



**Fig 9.12** Movement of the Floating Islands along the Ottawa River.  
Drawing by author.

What is a Floating Island made of?

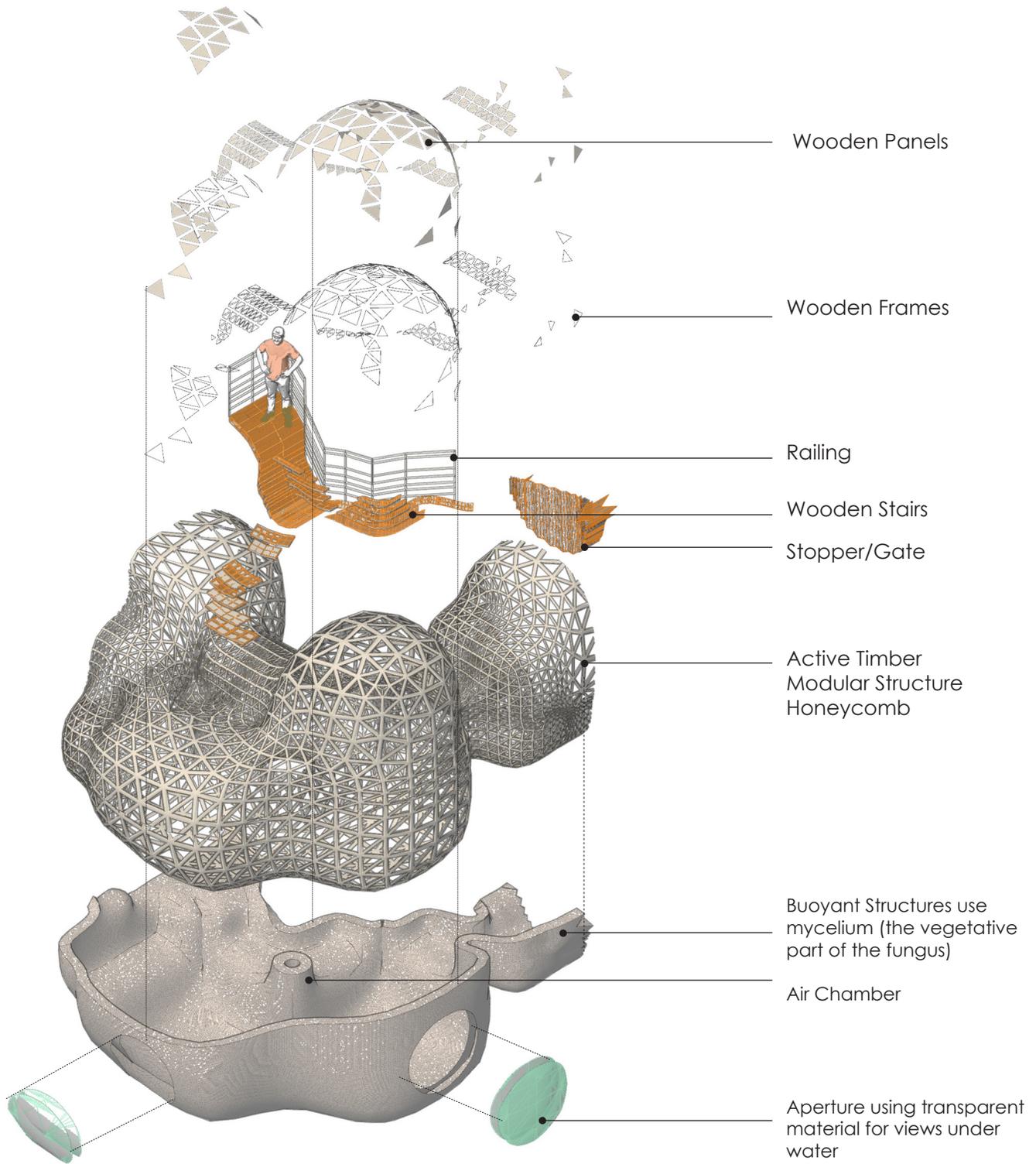


Fig 9.13 Exploded Axonometric View of A Floating Islands. Drawing by author

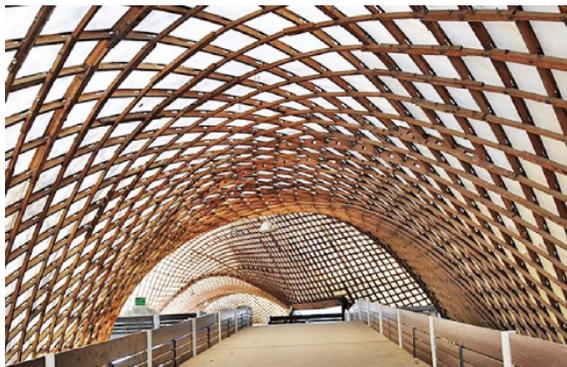
### Why Active Timber as a Modular Structure?

Because it is fluid and capable to create any space. It has been proven to be strong but light-weighted. It also reflects the nests made by birds as well as process of weaving patterns made by indigenous people.

The following examples prove that it has been done before in many forms, variations and purposes.



**Fig 9.14 & Fig 9.15** Bamboo Weaving Houses. Ethiopia. Photo by Nomads.org



**Fig 9.16** The Mannheim Multihalle was designed by Frei Otto and Architects Carlfried Mutschler and Winfried Langner. Photo by Inhabitat.

**Fig 9.17** The Centre for Native Child & Family Well Being in Toronto. Two Row Architect served as the Indigenous advisor to LGA Architectural Partners during the project. Photo by Ben Rahn/A-Frame.



**Fig 9.18 & Fig 9.19** Centre Pompidou-Metz by Shigeru Ban Architects. Photo by Didier Boy De Lu Tour.

Why the Buoyant Structures is made of mycelium (the vegetative part of the fungus)?

It is Bio-based and sustainable. First, this method has been used sustainable packaging materials. Later, Ecovative group revealed the ever Surfboards using this technology.<sup>44</sup>

*“Ever since, Mushroom Materials has also been used to design a biodegradable surfboard by Californian brand Surf Organic, providing an alternative to the popular fibreglass and styrofoam models.”<sup>45</sup>*

The reason I see this method to be used for the floating island, is because it is organic, durable, and easy to shape (**Fig 9.21**) & (**Fig 9.22**). Also, it has proved that it works perfectly in water and does not do harm. Moreover, it is has great insulation properties.

44 Ecovative 2013: “Grow.Bio”.

45 Manton 2015: “Mashroom materials of the year 2015”.

## Mushroom® Surfboards by Ecovative



**Fig 9.20** Mashroom Surfboards. Courtesy of ecovative.



**Fig 9.21 & Fig 9.22** Mashroom Surfboards. Courtesy of surf organic boards.

The floating island can make a stop anywhere along the edges. However, there will be designated areas as means of extensions to make the boarding (departure and arrival) easier depending on the specific edge conditions. Having said that, these two images (**Fig 9.23**) & (**Fig 9.24**) represent the existing conditions on Ottawa side near the Canal that is used for boats, canoes and Kayaks to board. Through my explorations, I see these existing conditions as a great opportunity for a Floating Island as well (**Fig 9.53**). Therefore, the river is the main connection on both sides. The river is the main reason that the edge conditions are constantly changing.



**Fig 9.23** Existing Edge Condition near the Canal. October 2018.  
Photo by author.



**Fig 9.24** Existing Edge Condition near the Canal. October 2018. Photo by author.



**Fig 9.25** Physical Model 1/50 creating the existing of the Edge Condition near Parliament Hill with the floating island residing the edge. Photo by author.



**Fig 9.26** Physical Model 1/50 creating the existing of the Edge Condition near Parliament Hill with a floating island residing the edge. Photo by author.

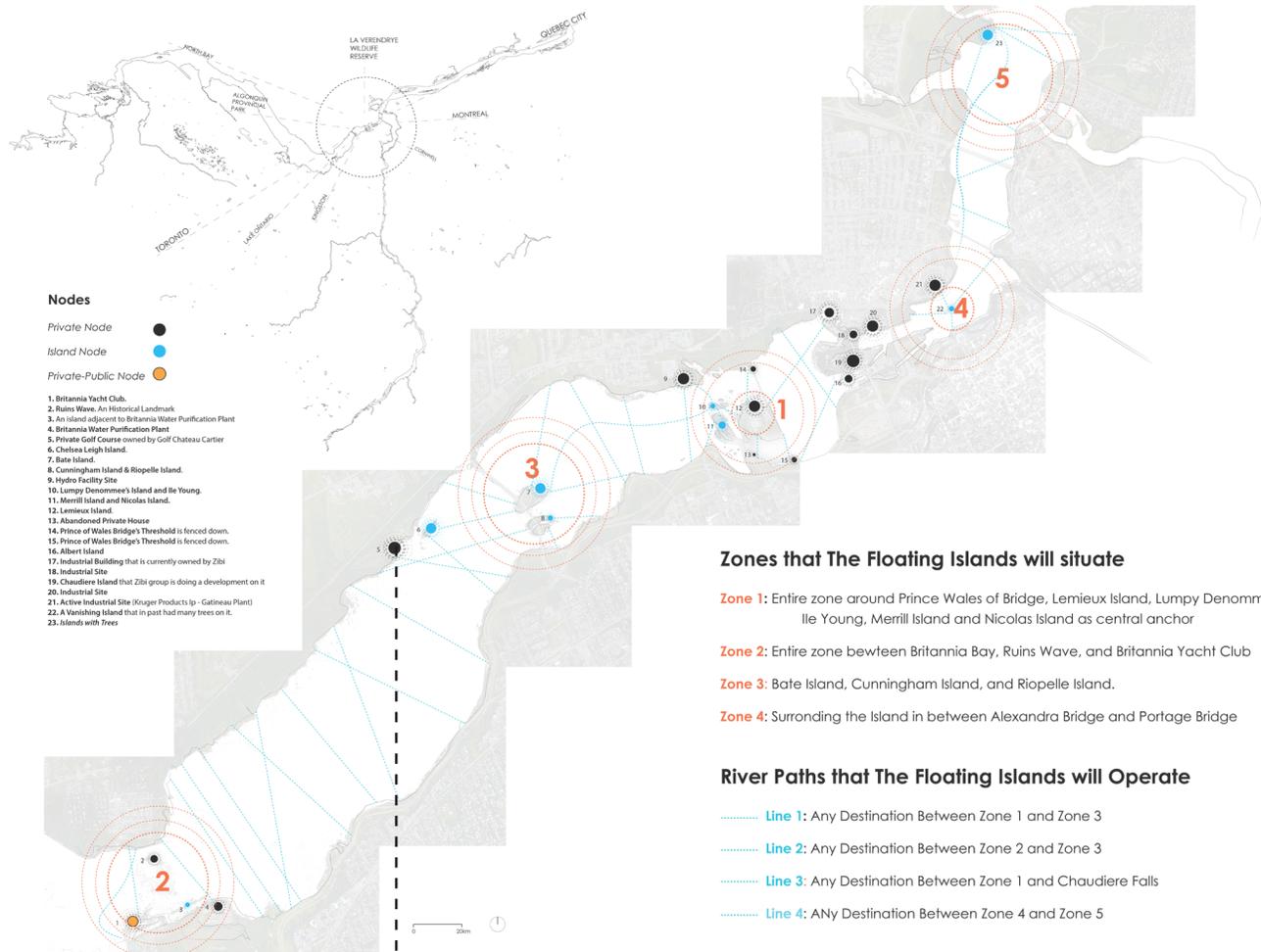


Fig 9.11 Map of The Floating Islands. Ottawa River. Drawing by author.

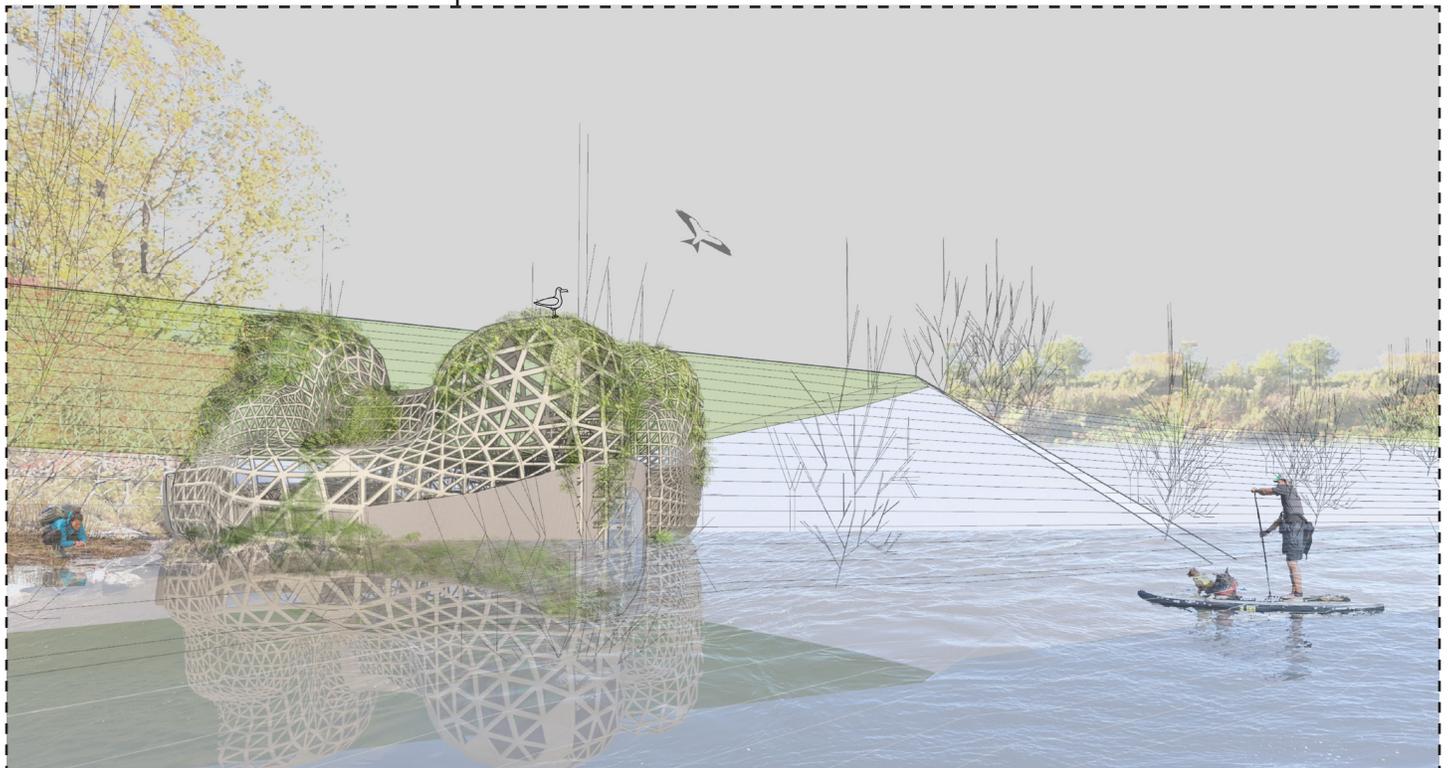


Fig 9.27 A view of a Floating Island along the edge of Node #5. Drawing by author.



Fig 9.28 A view of a Floating Island along the edge of the Ottawa River. Drawing by author.

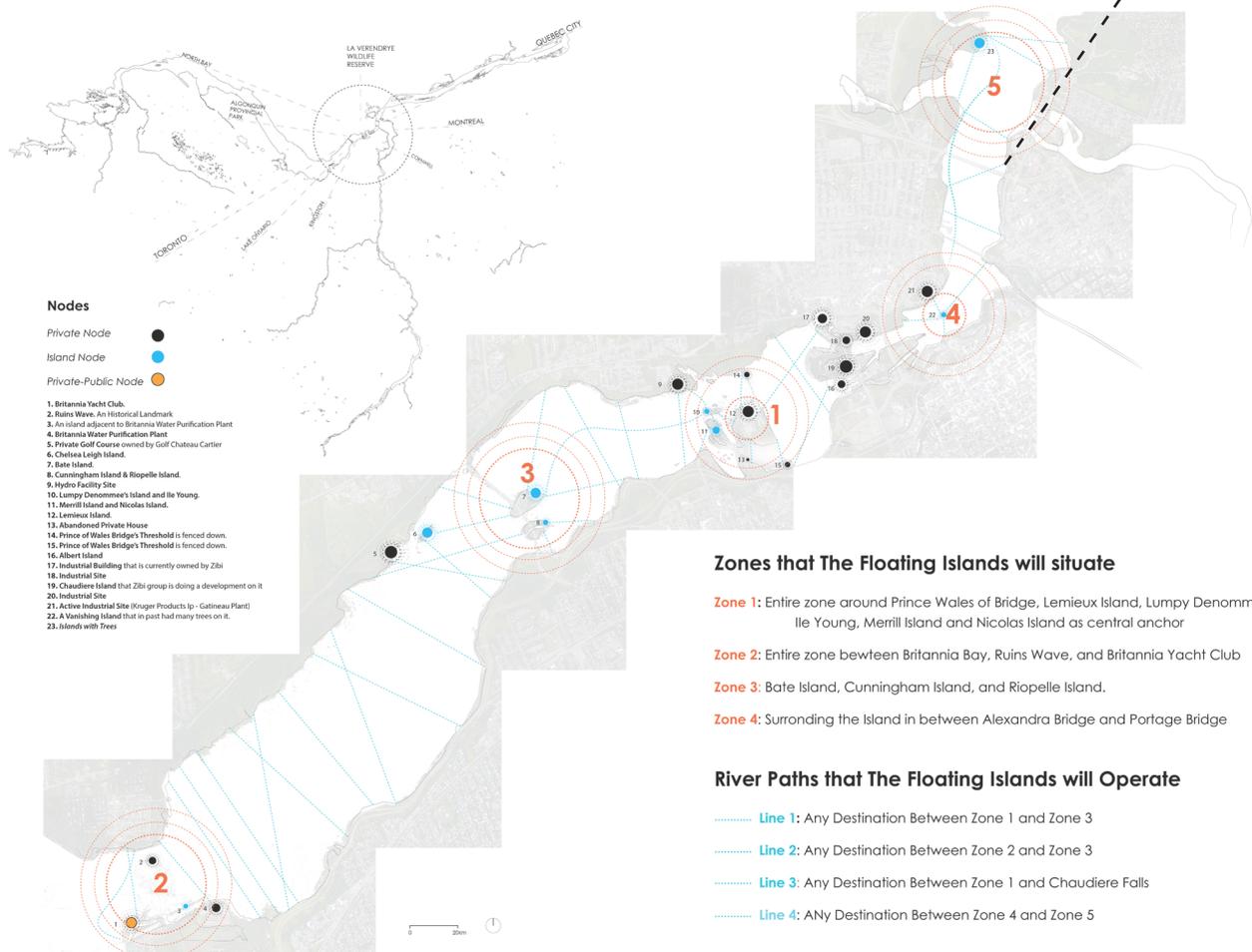
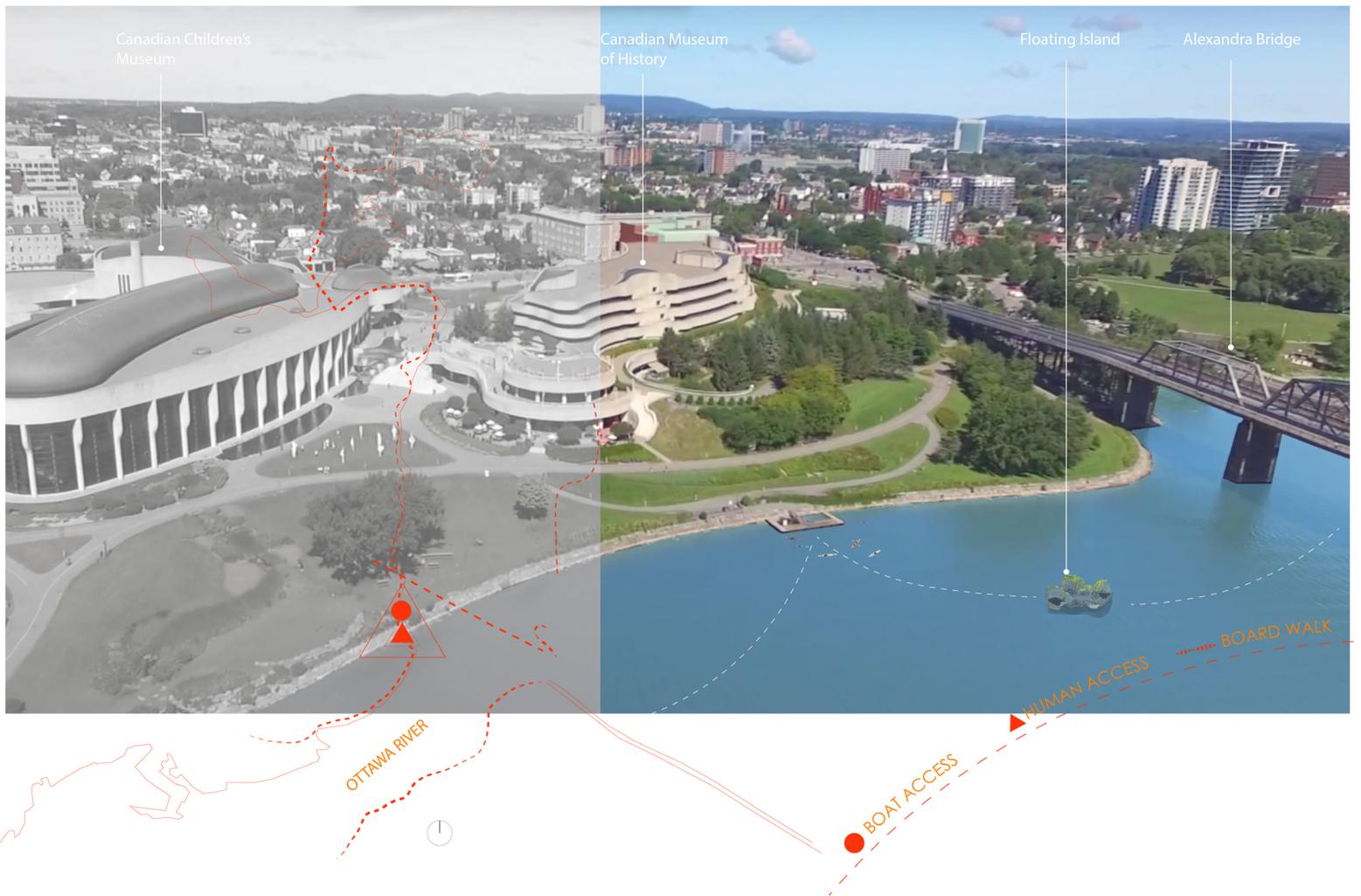
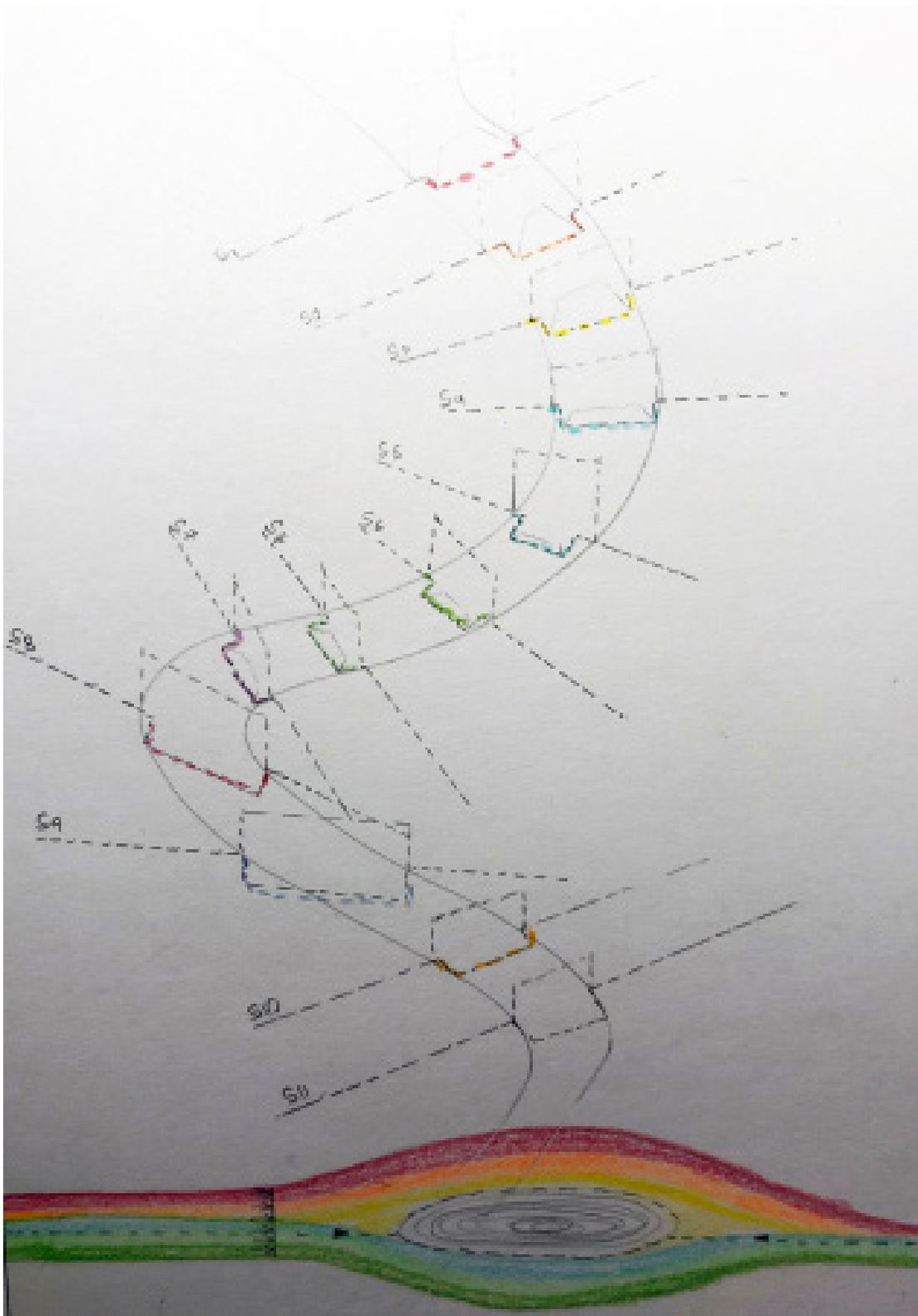


Fig 9.11 Map of The Floating Islands. Ottawa River. Drawing by author.

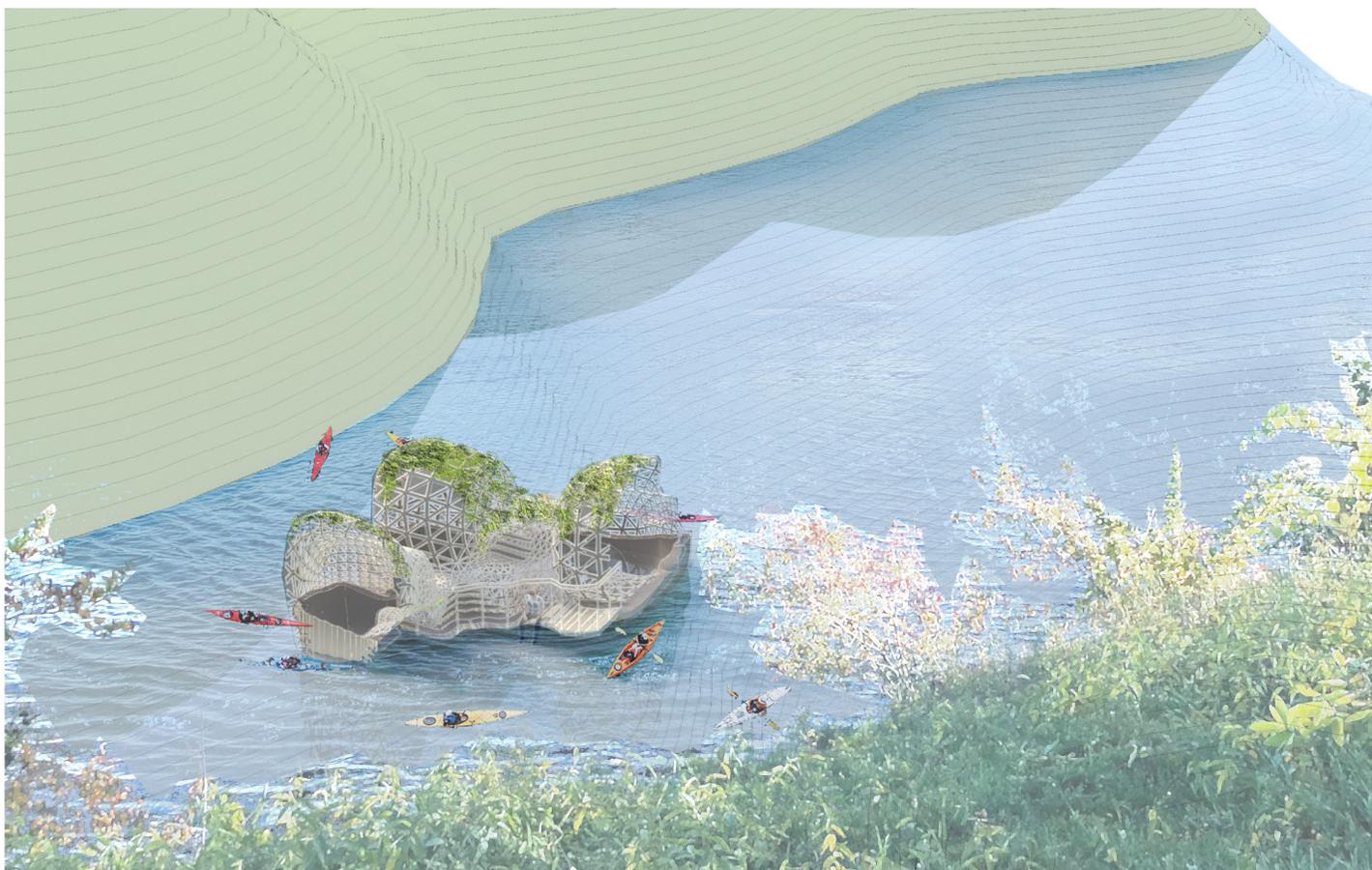


**Fig 9.29** A view of a Floating Island along the edge of Canadian Museum of History. Drawing by author.

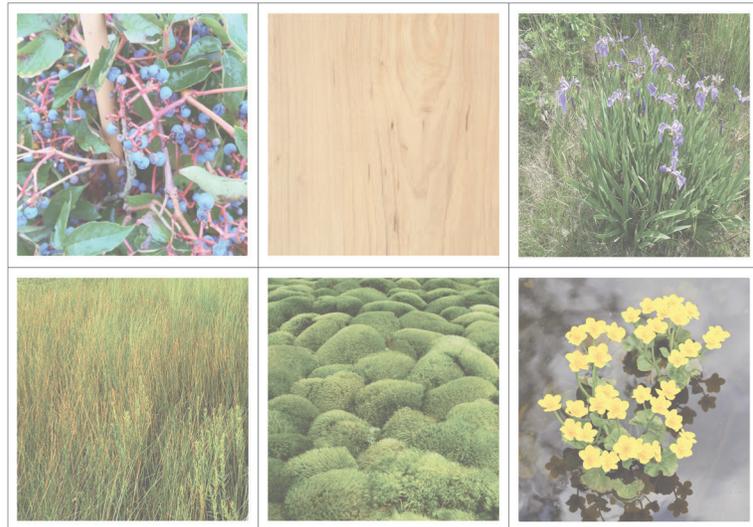


**Fig 9.30** The idea of flow along the river with different conditions is that the floating island is capable to transform and adopt to different dynamic edge conditions. Conceptual Drawing by author.

I envision the architecture to be made by an organic material that would allow moss and plants to grow on and within it. I also imagine this form of dialogue to be spatial for humans and welcoming for other species like animals and birds. Moreover, there is an opportunity to create an interaction with the water and fish species under the water.

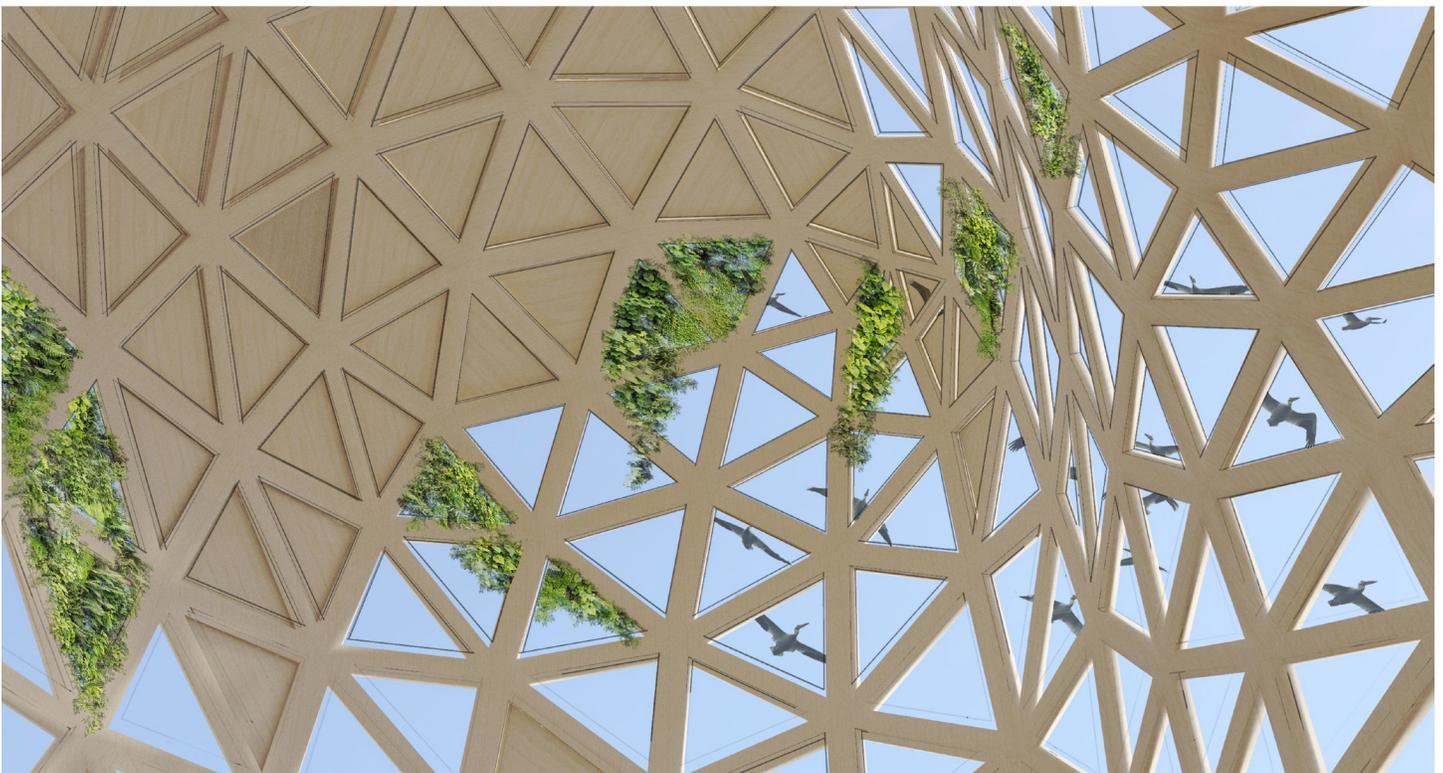


**Fig 9.31** A bird's eye view of a Floating Island along the Ottawa River. Drawing by author.

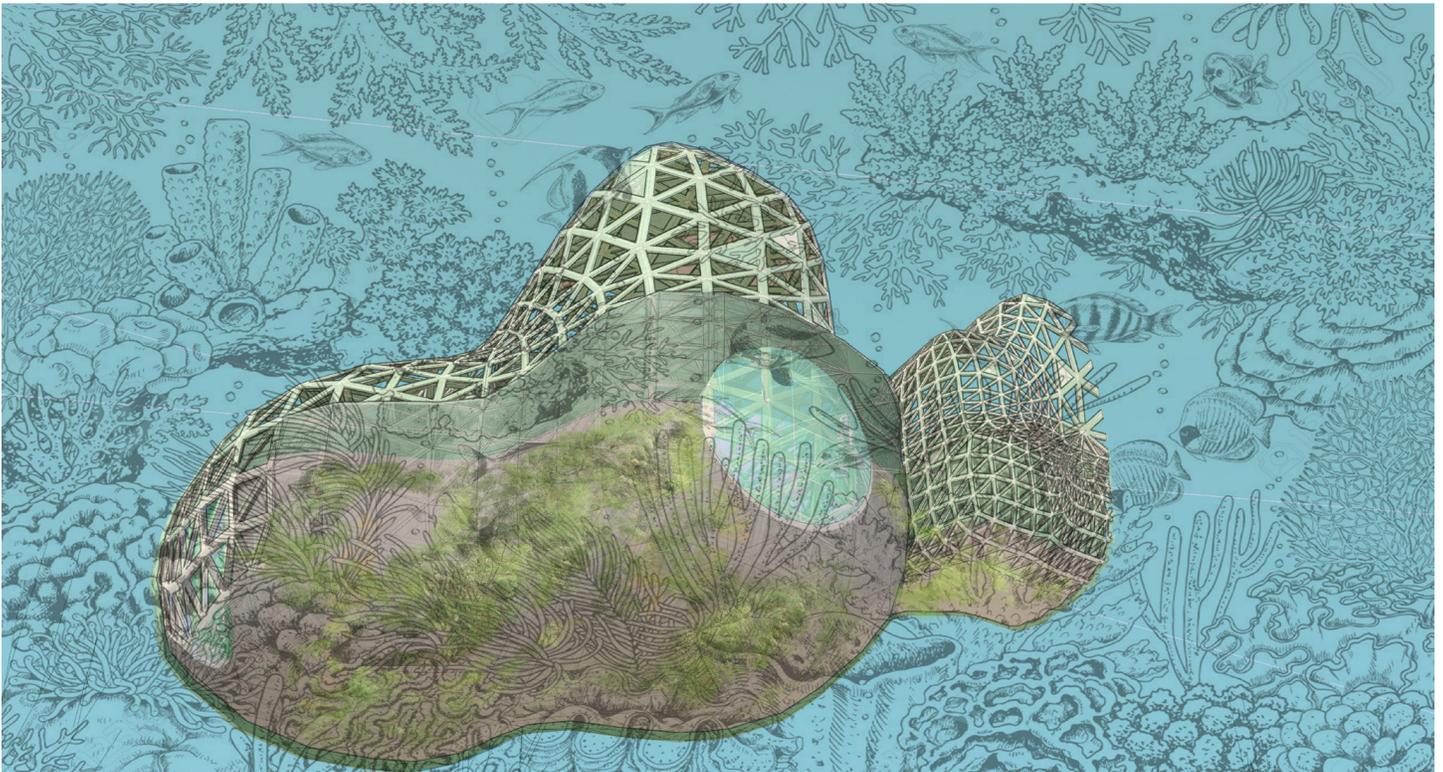


<b>1. Virginia Creeper</b> Vine type Product blue berries	<b>2. Moss</b> Always green	<b>4. Reeds</b> Native reeds	<b>5. Blue Flag Iris</b> Blue flowers bloom May-July	<b>6. Marsh marigold</b> Perfect for wetlands Blooms spring to summer
---	--------------------------------	---------------------------------	--	---

**Fig 9.32** Potential plants to be grown on a floating island. Drawing by author.



**Fig 9.33** A view of a Floating Island's ceiling and how effects of panels. Drawing by author.

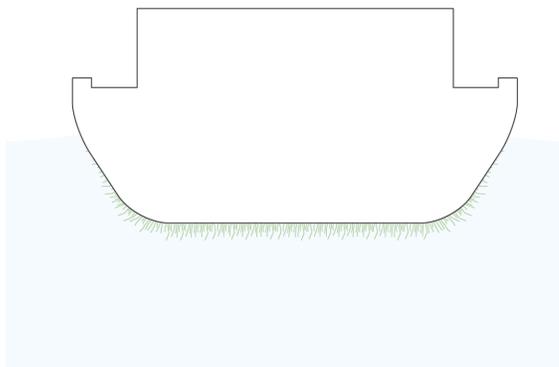


**Fig 9.34** A view of a Floating Island from under water.  
Drawing by author.



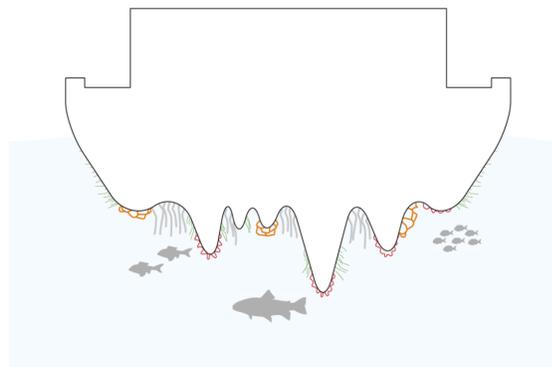
**Fig 9.35** Activities of fish species under a reed boat from "LOST ON THE ATLANTIC" documentary film (40:48). This particular footage explains how these species interact with organic materials underwater moving objects.

Through my research, I needed to understand the underwater world better. I came across the *LOST ON THE ATLANTIC* documentary film that inspired me about the potentials of natural materials. Moreover, I learned about the Architectural Ecologies Lab at California College of the Arts that is a platform connecting designers, scientists, and manufacturers into a collaborative research. Through examining their website, I learned more specifically about faculty research, their studio curriculum and graduate thesis research that often touch on the idea of different constructed ecologies. In one particular case, Buoyant Ecologies Float Lab is a resilient coastal floating architecture that studies the under water world carefully and tries to propose dynamic hill like spaces for species under the water. The following image is a digram explaining the difference between the flat bottom in comparison with the angular bottom. This diagram helps to understand the under water world and to consider the dynamic characteristic of the floating island. If one observes carefully the underside profile of the floating island that I designed (**Fig. 9.13**) in comparison with the diagram (**Fig. 9.36**) it is possible to notice that the design learns from both profiles. The floating island, in fact, has long horizontal section (**Fig 9.37**) and a few curvilinear deeps which are of larger dimensions than the ones in my precedent. The intent is to facilitate the approach of the invertebrates species to the under water ecology of the floating island while it is moving.



**FLAT BOAT BOTTOM**

- Fouling communities are uniform and homogeneous, typically consisting of the most dominant invasive species.
- Fouling communities are often seen as a nuisance for boats and other waterfront structures, requiring regular cleaning and maintenance.

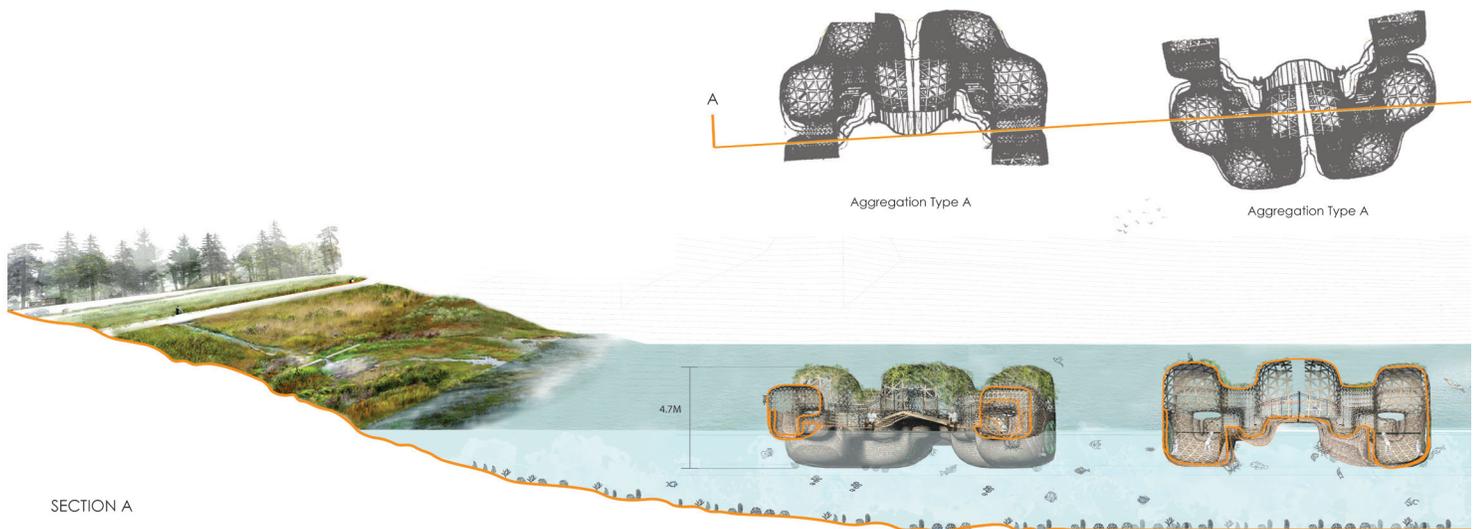


**OPTIMIZED UPSIDE-DOWN BENTHOS**

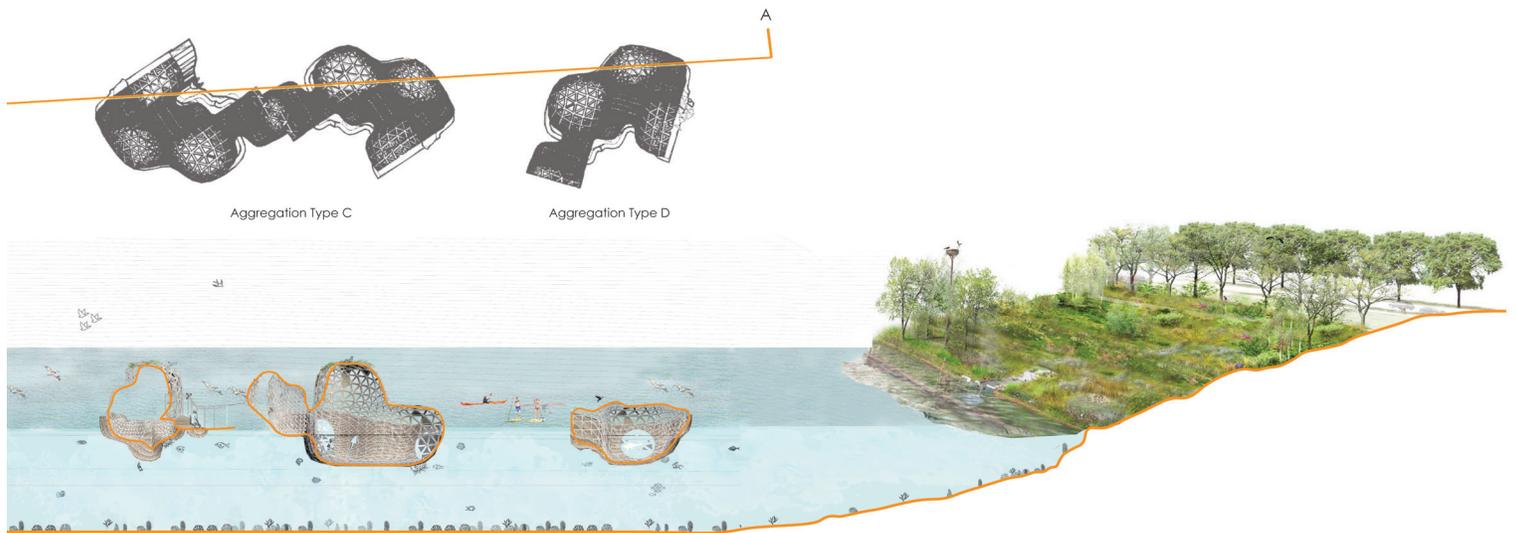
- Increased surface area provides more "real estate" for fouling communities to thrive.
- The fouling communities are more diverse, as smaller valleys provide refuge from predators for smaller species.
- Greater ecological diversity supports the food chain and enhances the broader ecology.
- Controlled growth of invertebrates could potentially perform as wave-attenuating "sponges," reducing the effects of waves and flooding on the coast.

**Fig 9.36** A great reference showing a diagrammatic study of under water of a floating Buoyant Structures and the capabilities. Courtesy of Buoyant Ecologies Float Lab.

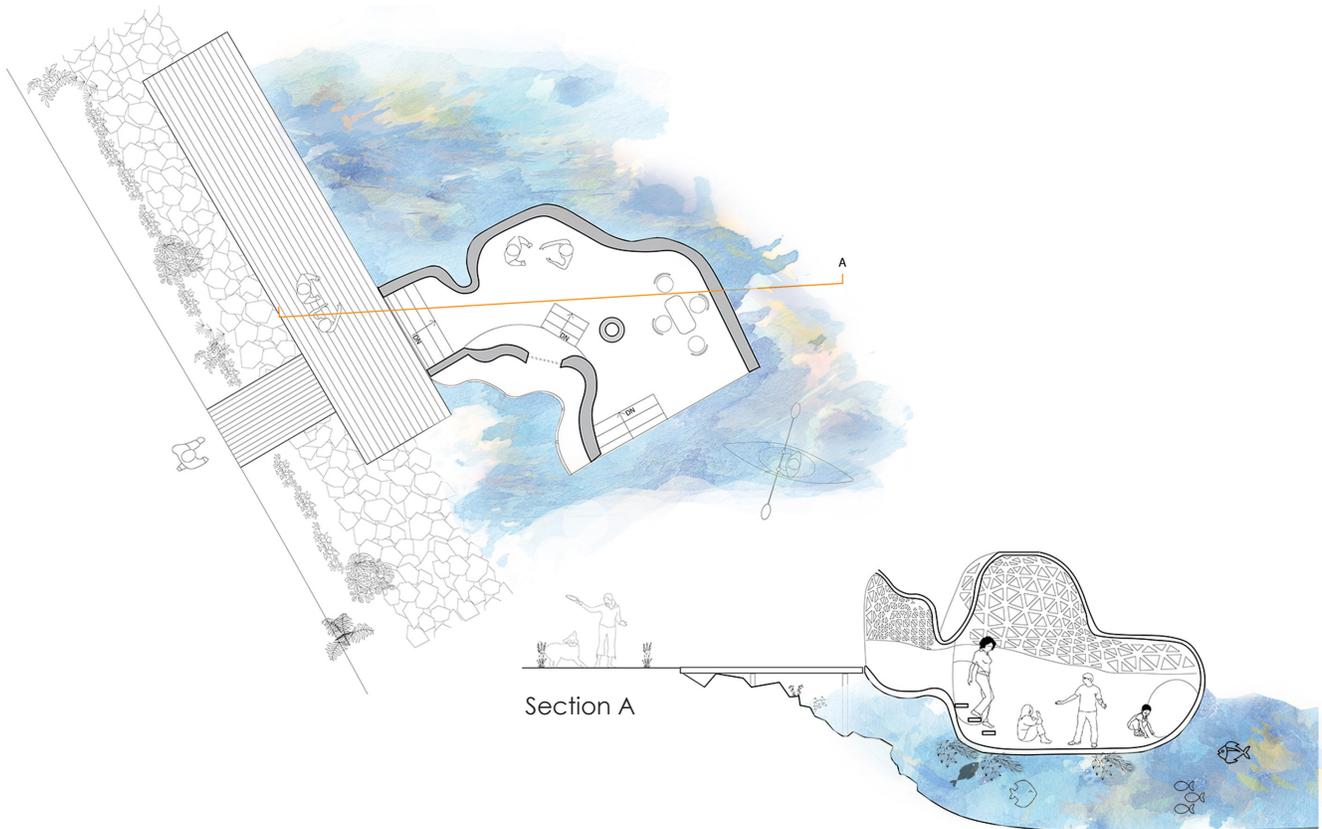
The floating island is assembled based on a modular system. This drawing aims to represent its possibilities in plan and section. As shown here, each of these floating islands is a new form of space that is different from rigid architectural spaces made with conventional floors, walls and ceilings. Spaces that enhance our sense of hearing, touch, and smell, allowing us to experience the river with all our senses. These ambitious modular islands are designed to provide a new architectural experience.



**Fig 9.37** Cross Section of the River (first half) showing different aggregation of the Floating Islands. Drawing by author.



**Fig 9.38** Cross Section of the River (second half) showing different aggregation of the Floating Islands. Drawing by author.

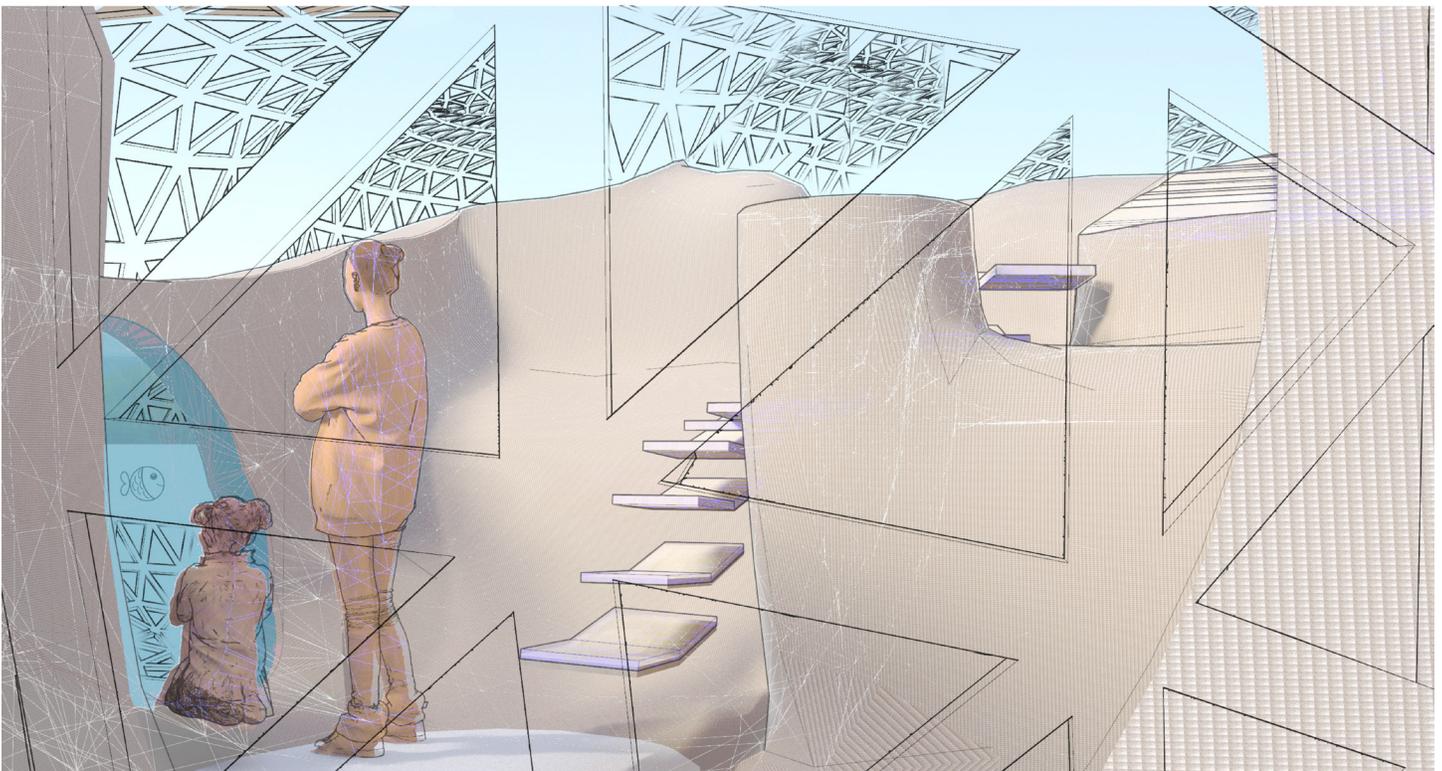


**Fig 9.39** A Detail Plan and Section of a floating island.  
Drawing by author.

This drawing aims to represent in plan and section, a particular condition when a floating island meets an edge of the river. There is a relationship between the existing shoreline condition, the board walk and the floating island. This drawing (**Fig 9.39**), explains what architecture means to me in a sense of dialogue between the edge and the floating island, and most importantly how humans interact with each other within the space inside and outside of the floating island (**Fig 9.46**). I embraced digital design tools to create an architecture that aspires to be a host for nature. In the digital era, it is possible to propose a floating island that veers in design from floating vessels that we know from precedents such as ice crawling barges and boats. I believe architecture can happen in this way: on water, being hugged by water, and within water. (**Fig 9.10**) and (**Fig 9.7**) While designing the floating island, I was generating spaces in all sorts of shapes and geometries both by hands in the form of physical models and also in CAD, modeling with Rhino (**Fig 9.5**) and Grasshopper (**Fig 9.42**). Therefore, to be clear, the design is the result of a process of architecture making and questioning what architecture does not how it

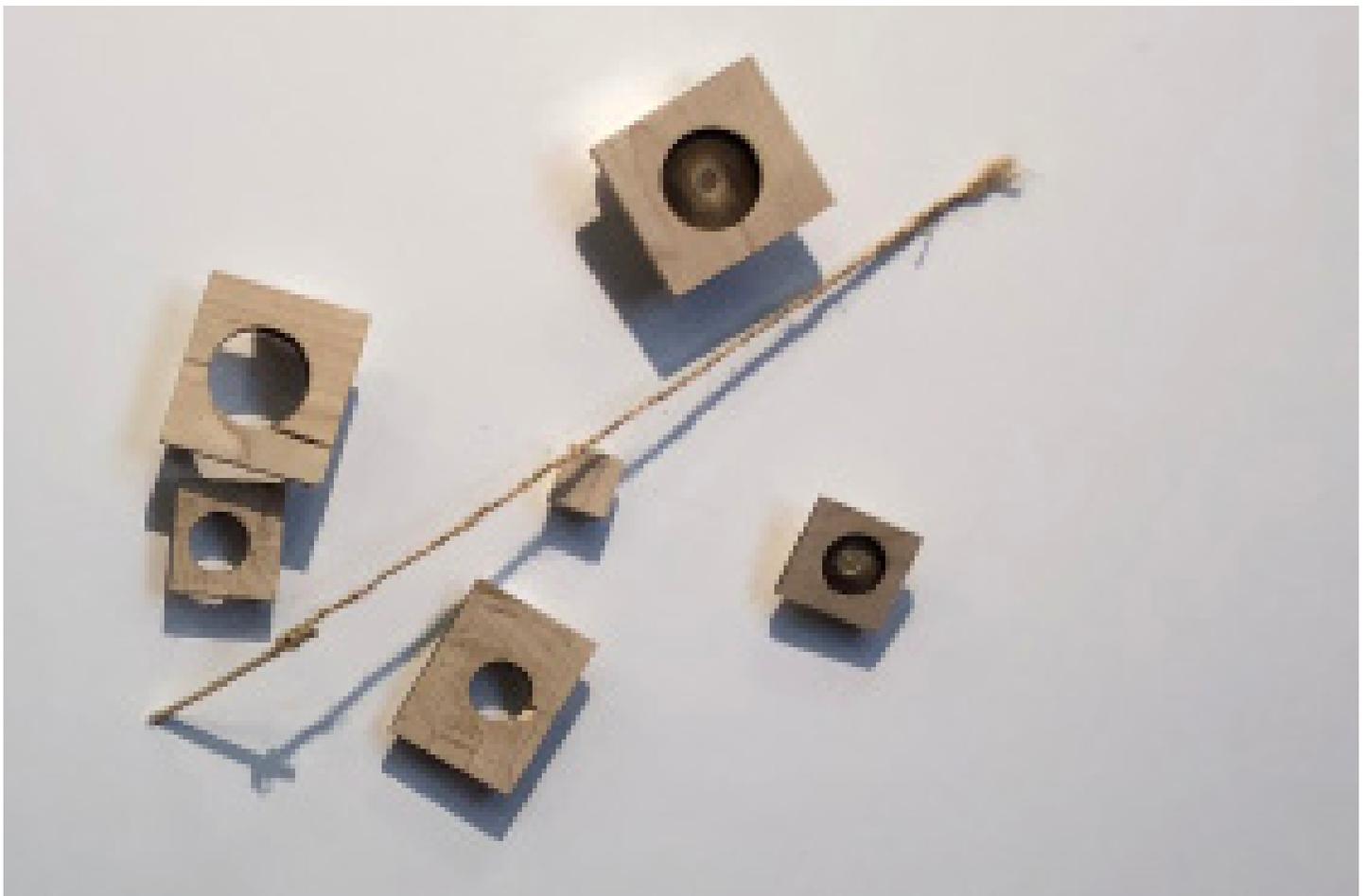
looks. I was engaged by the process of hand making and digital making, and this back and forth dialogue enriched the design in a way that I hope makes the floating islands exciting for the public. We are living a world where we need to constantly push the boundaries and make innovation for the betterment of the environment happen. This is the number one motivation for this thesis and an urgent task for humanity. The intent of this design is to create an exciting temporary architecture that can float using an innovative technology for a very important river in North America to sustain the local ecosystem.

Imagine looking into this space from one of the side apertures. The drawing (**Fig 9.40**) shows a particular impression to get a sense of what it would be like to observe the space from the outside in and experience a sense of lightness and fluidity. During the summer months when people are taking most advantage of the floating islands, in order to protect from strong sunlight, I provide a moderate sense of enclosure. With the modular wooden structure, I was able to capture a bird like space nest for both humans and birds amid this vast natural landscape like Ottawa river. The density of the wood pattern permits to control the amount of light, winds, and smells that can blow through this space. Also, people can climb up or hang objects from this structure.

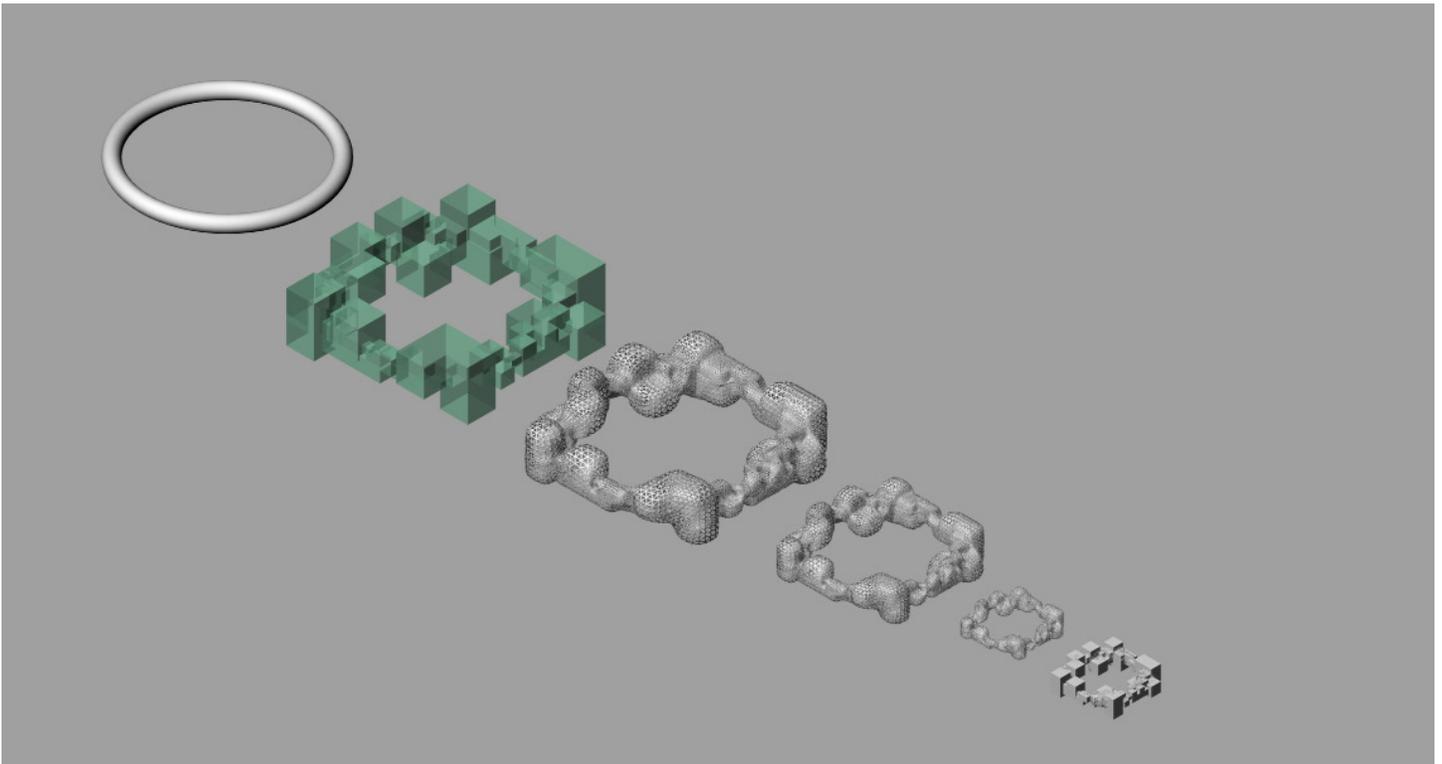


**Fig 9.40** A view of a Floating Island from outside towards the interior of it. Drawing by author.

Moving forward, I am interested in creating morphology and organic ecological modules. Through these types of explorations, the idea of modularity emerges. The aim is to seek cluster of cubes, each as one unit, coming together to shape a ring and a continuous flow all around (**Fig 9.41**).



**Fig 9.41** *The Floating Islands* Conceptual Process. Model by author.



**Fig 9.42** Imagining *The Floating Islands* through explorations of spatial architecture design . Drawing by author.

Perhaps the most fundamental form of architecture is, to design the site itself. The Ottawa River is very wide and I see a great opportunity to question how principles of an architecture can emerge a new dialogue between the floating islands. I believe an island is a site by itself. An island can be a bigger site especially when the floating islands get merged into one new network to show a new perspective. The drawing (**Fig 9.42**) shows a digital diagrammatic progress of form making on Rhino and Grasshopper. In this process, as shown on the left, everything started from the circle. The circle is a fundamental shape that makes me think of unity. Also, it reflects The Medicine Wheel which “symbolizes the interconnection of all life, the various cycles of nature, and how life represents a circular journey.”<sup>46</sup> All these islands connect into a single circular fluid space island. As one large network, they also form four corners, referring to the significance of the ‘number four’ which is sacred to “the many indigenous people of North America and can represent many things”.<sup>47</sup>

46 University of Ottawa Faculty of Medicine: “Indigenous health”.

47 Ibid.

The significance of number four in indigenous culture is witnessed by many sources. I enclose below, series of them which refer to fundamental ideas of Medicine Wheel: "The four seasons, the four parts of a person (physical, mental, emotional and spiritual); the four kingdoms (animal, mineral, plant and human); the four sacred medicines (sweetgrass, tobacco, cedar and sage)."<sup>48</sup>

"The four points of the compass, each with a guiding spirit, symbolize stages in the life journey. The East, direction of the daily birth of the sun, represents a person's birth and early years. The South relates to childhood and intellectual growth. The West symbolizes adulthood and introspection, while the North represents the old age, wisdom and the spiritual aspects of life. The centre of the wheel is symbolic of Mother Earth and the Creator, and their role in the beginning and continuation of life.

Diagram of Aboriginal medicine wheel."<sup>49</sup>

"The four points can also represent the balance between spiritual (East), mental (North), physical (West) and emotional (South) aspects of health."<sup>50</sup>

"The wheel can also represent values and decisions. Here, values (drawn in the East, where the sun rises) influence decisions taken in the mental realm (drawn in the North, at the top). Then, decisions are implemented in the physical realm (West), and actions produce reactions in the emotional realm (South). Finally, these reactions provide feedback into the value system, completing the circle of value - action - evaluation."<sup>51</sup>

In the case of floating with water current, these islands can move away from each other but still have the spirit of unity in their shapes and structural behaviors.

48 University of Ottawa Faculty of Medicine.

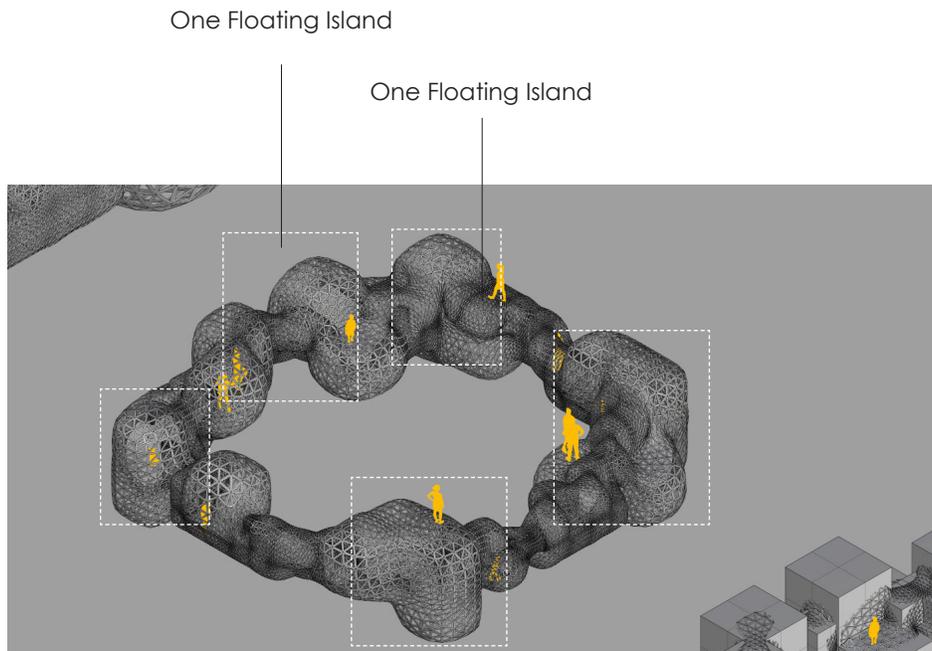
49 Ibid.

50 Ibid.

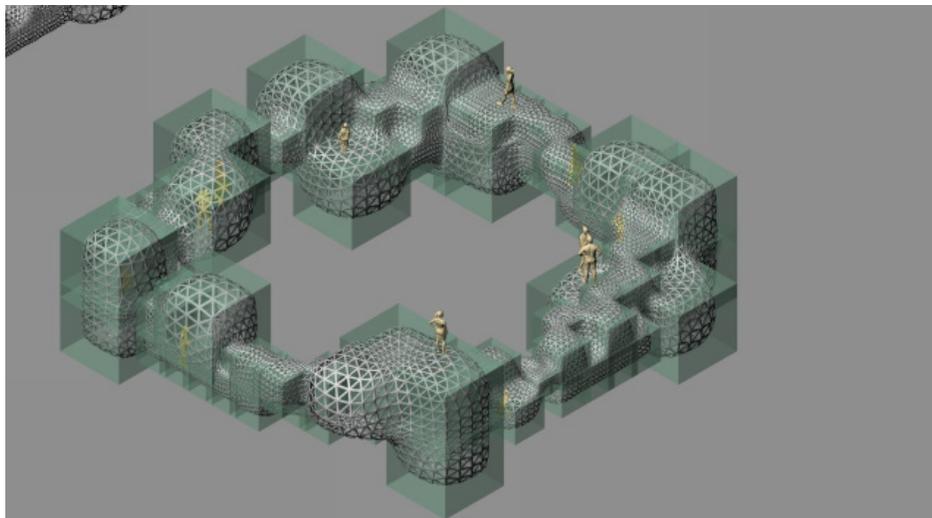
51 Ibid



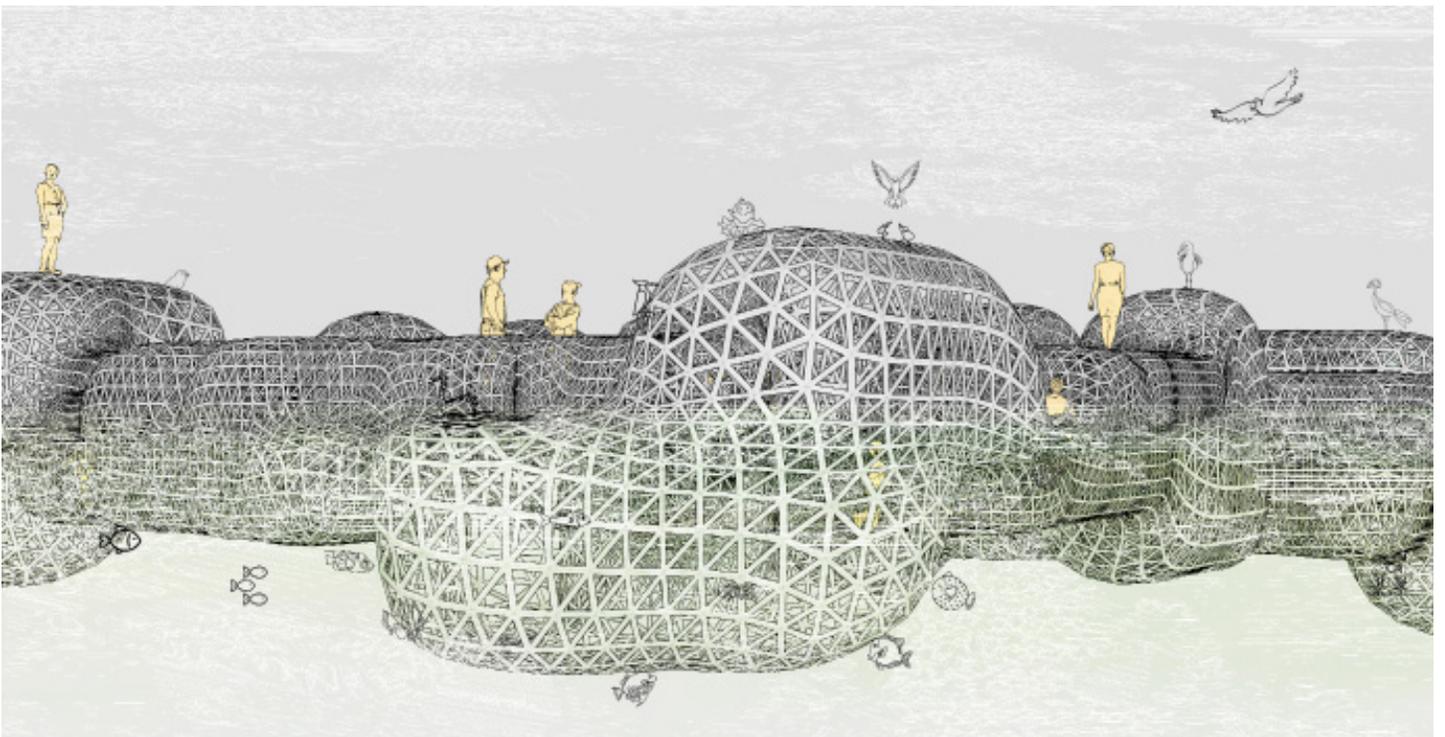
**Fig 9.43** Cluster aggregation of the floating islands. Drawing by author.



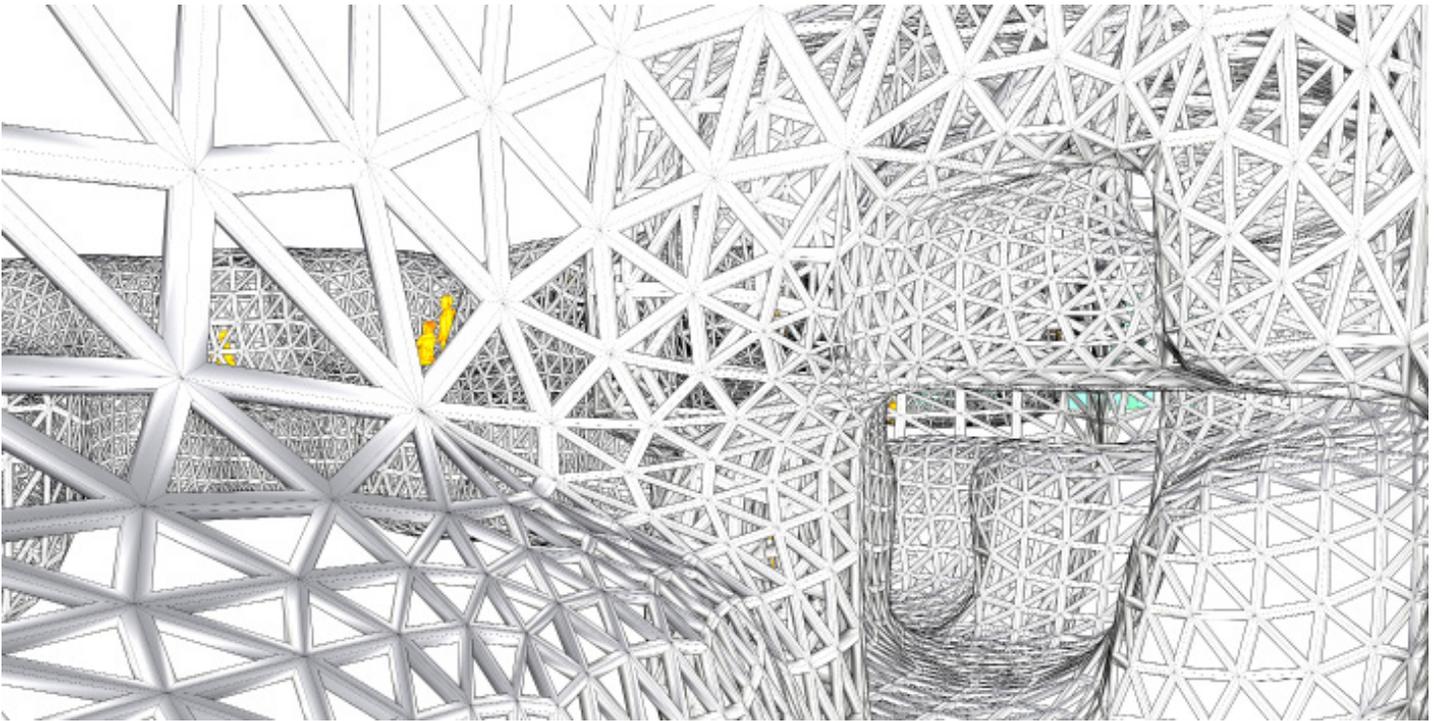
**Fig 9.44** Imagining series of modules coming together to form *The Floating Islands* as an entire network for a specific event. Drawing by author.



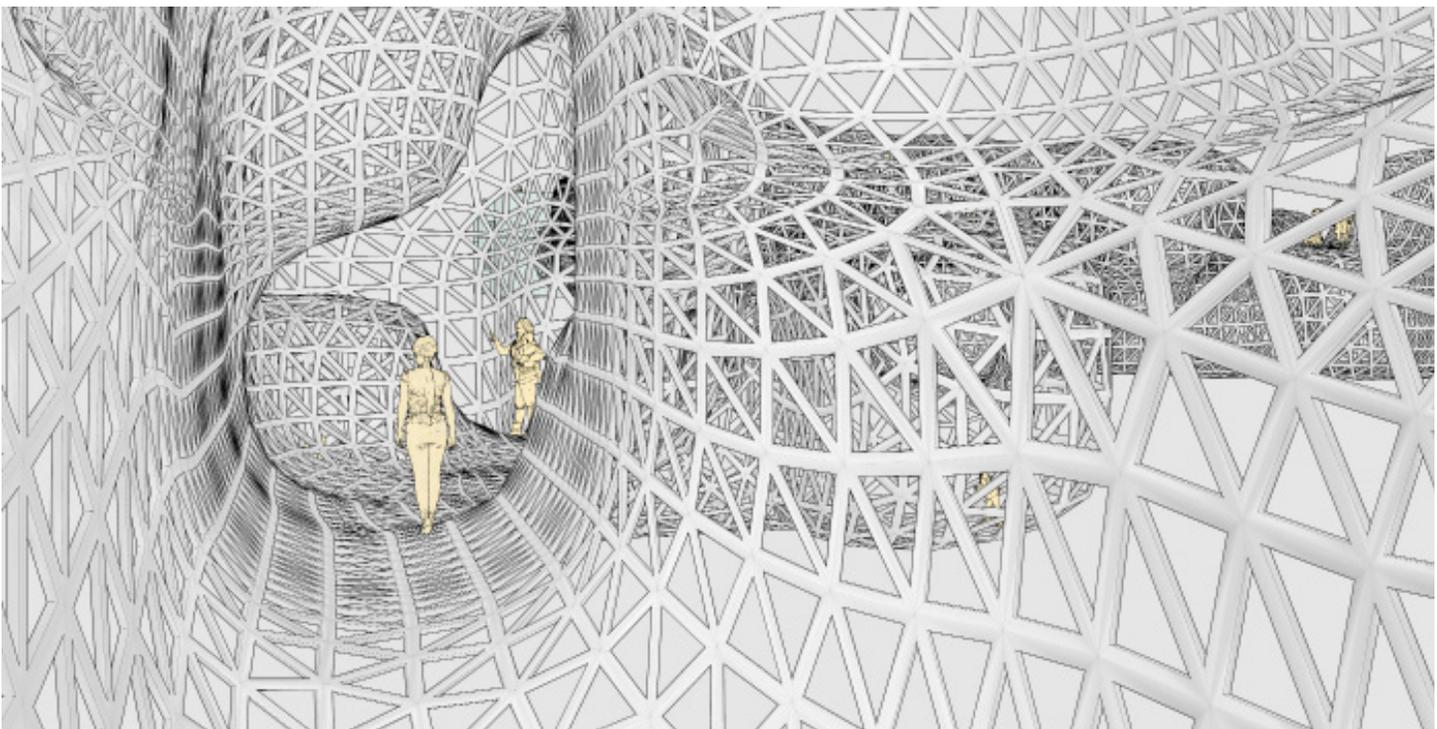
**Fig 9.45** Imagining *The Floating Islands* through explorations spatial forms created by cluster of cubes coming together as an entire network. Drawing by author.



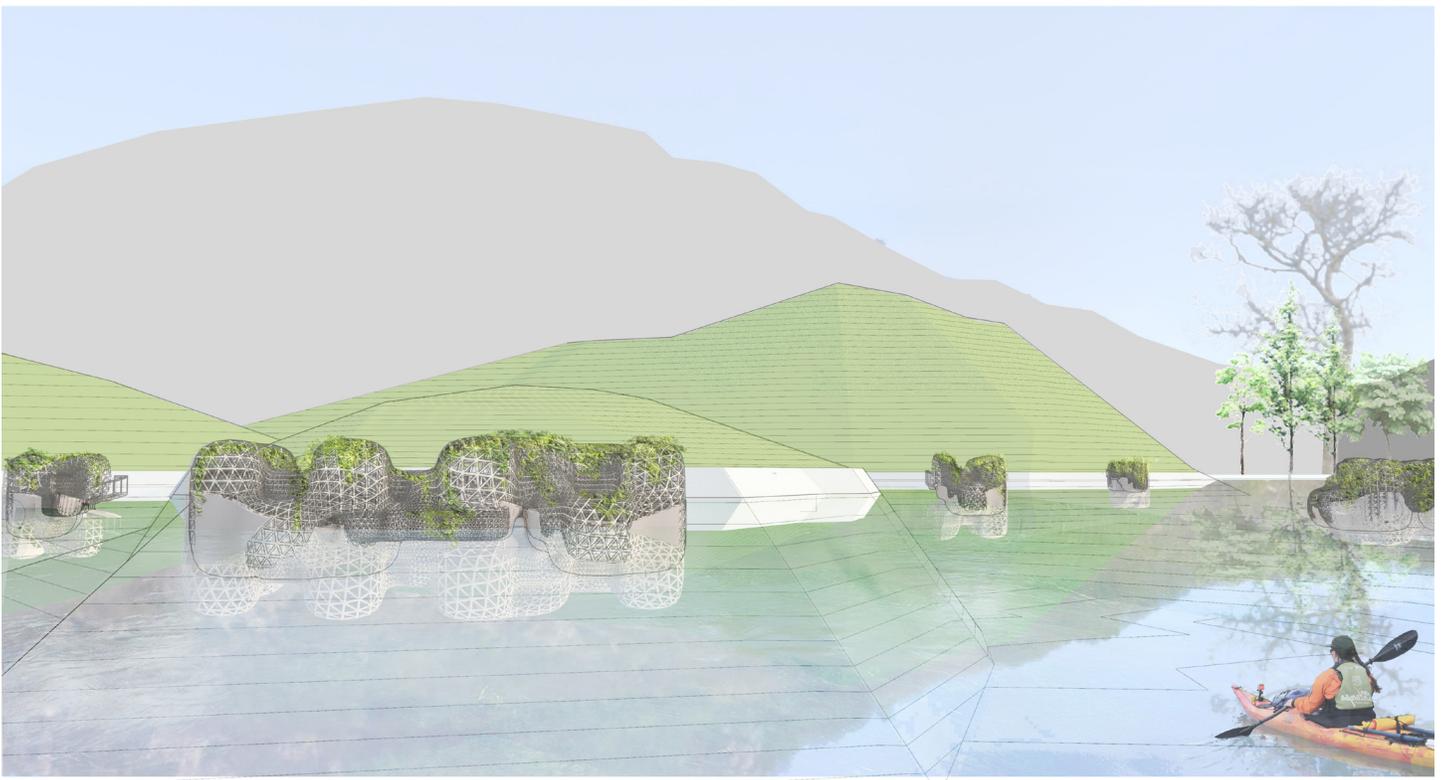
**Fig 9.46** Imagining the opportunities to habitat above, below and within the entire network. Drawing by author.



**Fig 9.47** Imagining *The Floating Islands* through explorations of spatial quality floating on the water. Drawing by author.

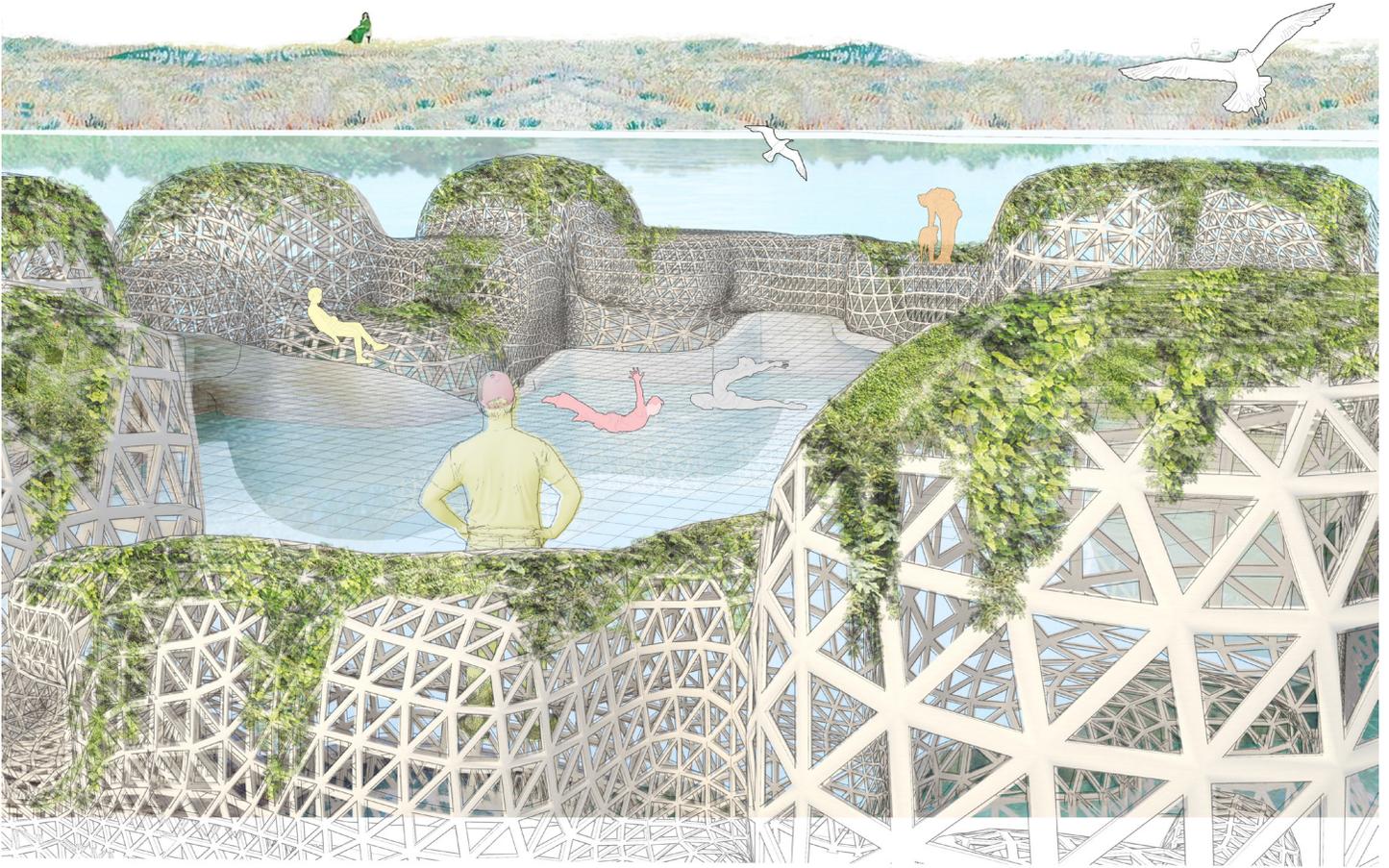


**Fig 9.48** Imagining *The Floating Islands* through explorations of spatial quality floating on the water. Drawing by author.

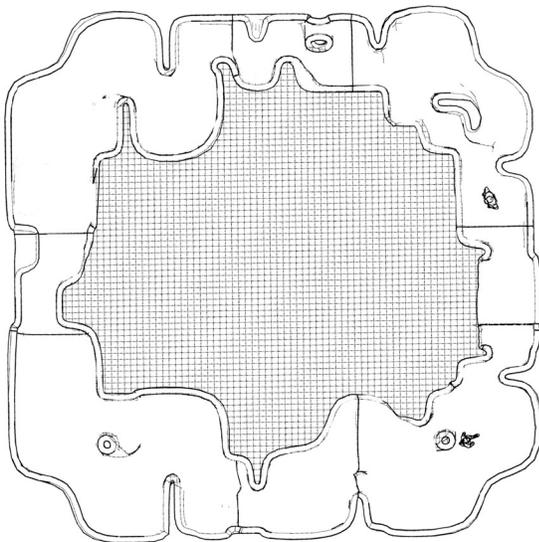


**Fig 9.49** A view from water showing the a cluster of floating islands.

Drawing by author.

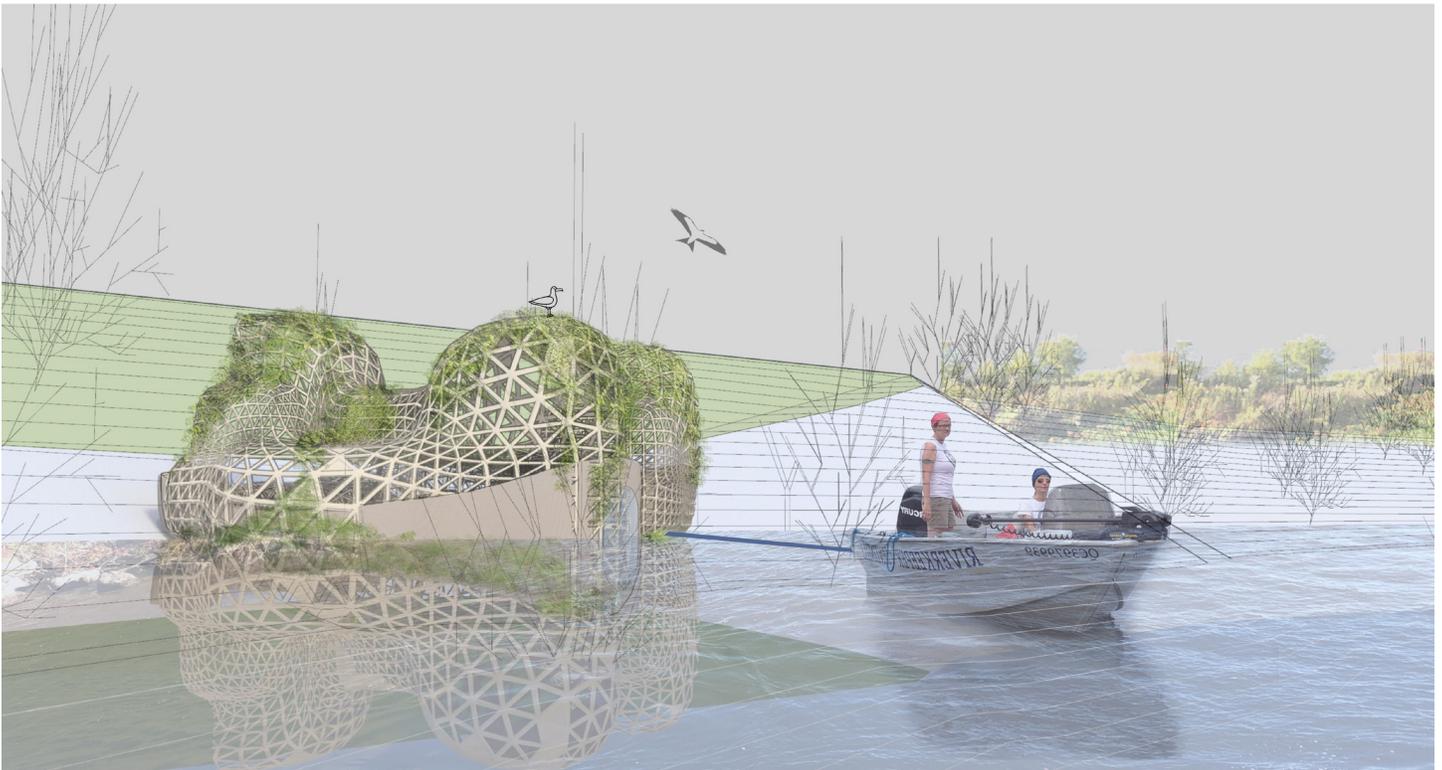


**Fig 9.50** A cluster of floating islands coming together in unity for a special event. Drawing by author.

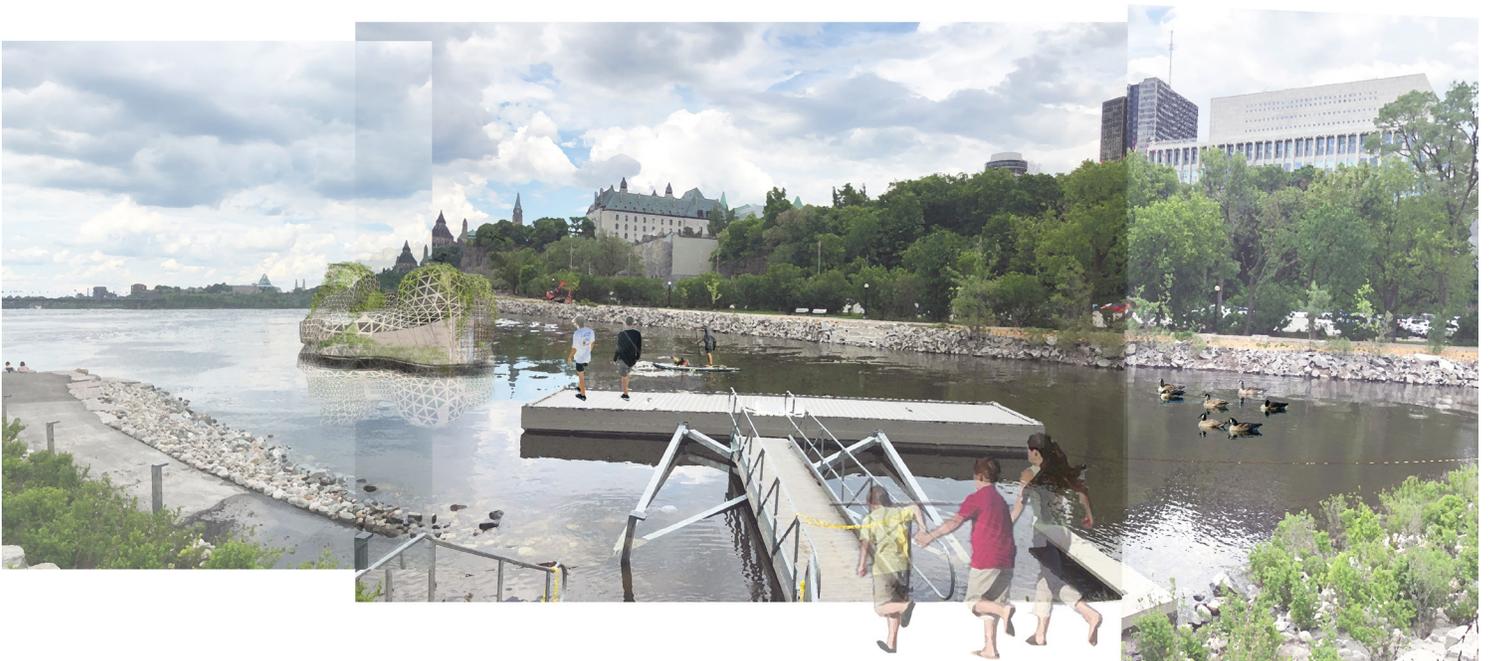


**Fig 9.51** Plan of a cluster of floating islands coming together in unity for a special event. Drawing by author.

How does a floating island work against the stream? It will be simply being pulled by the Riverkeepers' boats (**Fig 9.52**). Every day, the Riverkeepers have many patrols moving along the river. Therefore, there will be a possibility for these islands to be pulled from one location to another.



**Fig 9.52** A floating island being pulled by a riverkeeper's boat. Drawing by author



**Fig 9.53** View from Victoria Island facing East towards Parliament Hill. This drawing by author is showing the relationship of an existing floating dock during May 2019. This opportunity offers people to board into the floating island easily.

## **Conclusion/ Postscript**

### Voice of the River

The project of the floating islands on the Ottawa river, the Valley of the *Kiji Sibi*, also known as the Great River, reflects the importance of temporary architecture to create dialogue between people, inviting them to the river, to develop an educational approach that will be part of the engagement and interaction. Also, providing opportunities to all parts of the river, especially to certain nodes along the edge where access has been denied in the past in order to open up an opportunity for people to understand the Ottawa River Watershed better, and to protect it for future generations.

The purpose of this thesis is to emphasize the potential of the edge conditions along the Ottawa River and its linkage points. The intention is to consider ways to re-imagine our riverfront for future generations by raising awareness about the important qualities of water and its psychological values in our lives. It is argued here that the river is about many sides, past two physical river banks. Therefore, *The Floating Islands* aim to create an opportunity to bring everyone together in unity to talk about the existing cultural, political and economic issues intersecting and flowing through the region. Also, I argue that if we do not have interactions with the Ottawa river, we will not know how to protect it. This thesis is contributing to understanding the Ottawa river as place of gathering and the importance of accessing it. The notion of improving access to it from any point on the river is important. In other words, participation and inviting people to becoming involved with the Riverkeeper organization is very important. The Floating islands is tailored around their program and contributions to the Ottawa river. The Riverkeeper will be in charge of managing the floating islands.

Through my interest and engagement with the Riverkeepers and having an opportunity to learn from other precedents, I was inspired to pursue the design of floating islands for the Ottawa river. The approach of this thesis is inclusive of engagement and teaching through a non-western approach to all people. The floating islands become an inclusive platform to offer experiential learning. An educational approach will be combined with engagement to promote interaction with the river. This will lead to giving back through activities that will help to improve the conditions of the river. Direct group activities such as places for thinking and contemplation, discussions, planting, harvesting, and leisure engagements could be explored (**Fig 9.50**). One of the central design strategies for this thesis is the idea of Floating Islands, that aim to become a new element of the Ottawa river watershed. These are a series of accessible fluid movable and flexible structures that promote diversity, education and most importantly interaction. A key intent of the project is to bring all people from different cultural background together to benefit the Ottawa river and help the Ottawa riverkeepers in promoting the importance of clean water. The asymmetrical geometry of the design is meant to reflect the cultural diversity. I believe that a fluid architectural design with irregular curves may attract people's attention and provide a an environment for local species just like the precedent that I discussed of *Floating Garden Island* by Moss architecture design green and the Chicago River Habitat Restoration (**Fig 8.6**).

Experiencing the activities organized by the Riverkeeper organization with the support of the floating island will bring dialogue and engagements. Moreover, it is important to have a floating space on the water to learn about the Ottawa River through direct access to many places.

This exciting and engaging experience for all will be remembered as a particular lesson. The floating islands celebrate our watershed through collaboration, participation and dialogue.

The idea of crossing borders moving beyond theoretical and physical obstacles is to provide an opportunity for humans and animals to travel through the river encouraging access, and contemplation **(Fig 9.46)**.

The ability to access all part of the river is essential in order to appreciate it. My intention was to design an floating island that is temporary and available to everyone including humans and other habitats of the watershed such as fish species and birds. Hopefully the creation of floating island would allow more conversations to occur between people, and could lead to a place for thinking, engagement and collaboration. This thesis investigated the design of a series of islands that the Riverkeepers could benefit from, which would allow them to promote the importance of the river through a new innovative design.

Through this thesis, I am thankful that I was able to learn more about the Indigenous communities. I was able to participate in successful events such as *Generation Climate* through the Ottawa riverkeepers, that was focused around Climate change. During that event, I had a wonderful opportunity to meet Elder Verna McGregor from the Algonquin Community of Kitigan Zibi Anishinabeg. She was the opening speaker for the event. An event that was focusing to engage with youth. Her talk was, enlightening, as an intellectual and humble role model, and I learned so much about her and her community members. I was fortunate to hear some of her treasurable stories and ideas and her perspective towards the urban environments and mother nature. She mentioned the Riverkeepers' work and initiatives and showed support and recognition for what they do. She also mentioned that youth are capable of bringing innovated ideas to the fore in order to help climate change related issues. Elder Verna McGregor, ended her talk by singing a song for us and then she advised us :

*"never underestimate your ideas, be strong, that is why you been alive here, earth needs you as well as animals."*<sup>52</sup>

After hearing her perspective towards the future, I was very motivated to continue with my thesis. I wish I had more exposure to the indigenous communities when I grew up in Toronto. This was a major gap

that I was experiencing. In the beginning of my thesis, I experienced a gap of knowledge and exposure to their culture. Later, during the process, I tried to make up for it, however I realized the importance to continue to read and research more, and I strongly believe in opportunities that interactions with first nations may bring in order to understand their cultures and values. Such interactions would be not only helpful but necessary for this fictional proposal if one was to engage into a process that contemplates the possibility to bring a floating island concept into realization.

Moreover, I strongly recommend every Canadian designer and artist to consider learning more about the First Nations. They are the essential part of our Canadian roots. We need to respect them. We need to thank them in order to honour their being, and what their ancestors have left for us. Their culture is rooted around a fundamental understanding of the earth, that will help us know more about ourselves as human beings. I also recommend future architecture and urbanism students to volunteer with the Ottawa Riverkeepers. I have been fortunate to learn so much more about the Ottawa River Watershed because of them. Participating in most of their events through the process of this thesis was helpful and inspiring (**Fig 10.0**). Beside the staff, and volunteers, I met families from different communities that appreciated this unique organization. Those families also dedicated their time to bring awareness towards the Ottawa River Watershed. Having said that, I think that volunteering with them, will bring a fundamental learning experience for anyone at any age group. Interactions with the water is an important binding factor that my thesis thrived to do. I hope with my continuous engagement with the Riverkeepers, I can create more dialogue and interactions around the idea of *The Floating Islands*. More dialogue will help me receive more feedbacks. More feedbacks will help the concept to get developed.

Looking at the idea of *The Floating Islands* (**Table E**), I see a great opportunity for this vision to get introduced to other parts of the watershed as well as other rivers around the world. As long as there is an organization like the Riverkeepers in their region, I am optimistic that this program and function can be useful for them in order to celebrate their watershed. Therefore, one of the central design strategies for this thesis is the idea of *the Floating Islands*, which aim to become a new element of the Ottawa river watershed (**Table G**). The floating islands would be used to develop

an educational approach that will be part of the engagement and interaction with the river. This will lead to giving back through activities that will help to improve the conditions of the river. Direct group activities such as places for thinking and contemplation, discussions, planting, harvesting, and leisure engagements could be explored. They promote diversity, education and most importantly interaction. *The Floating Islands* celebrate our watershed through collaboration, participation and dialogue. The idea of crossing provincial borders through theoretical and physical obstacles is to provide an opportunity for humans and animals to travel through the river in a steady pace. Also, it is an opportunity for humans to understand the Ottawa River Watershed better in order to protect it for our future generations.

# Project Panels

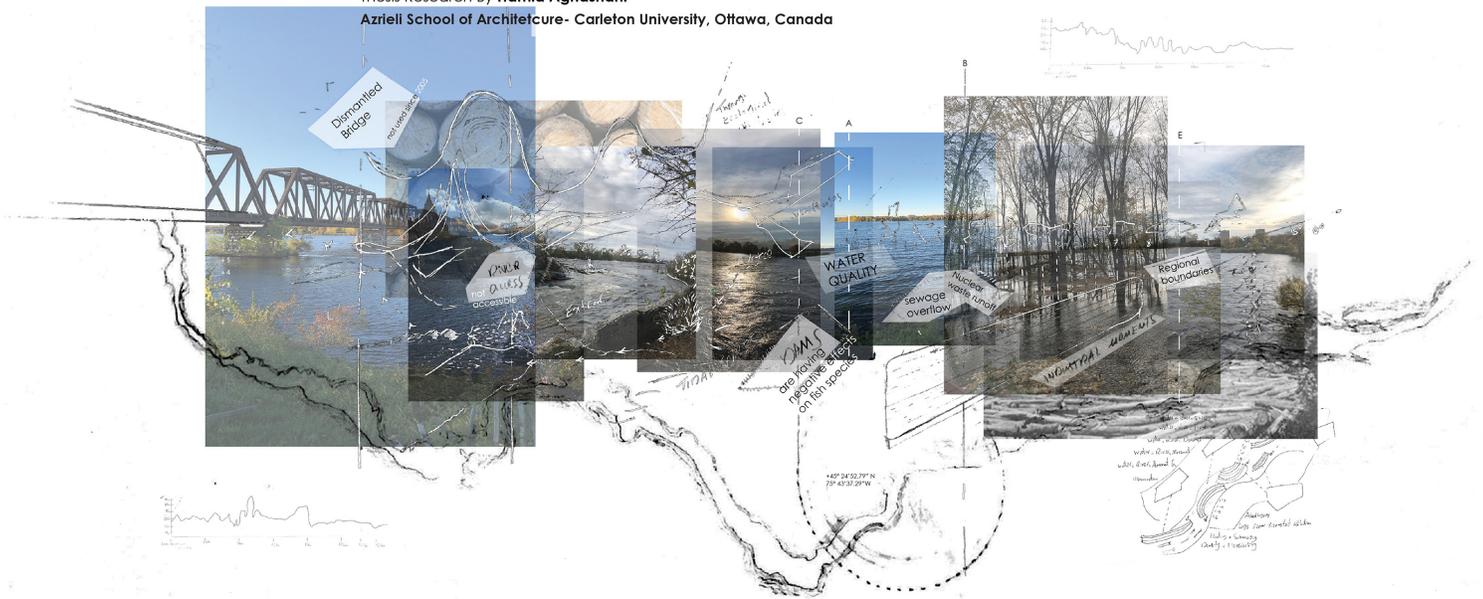
Voice of the River

## Voice of the River

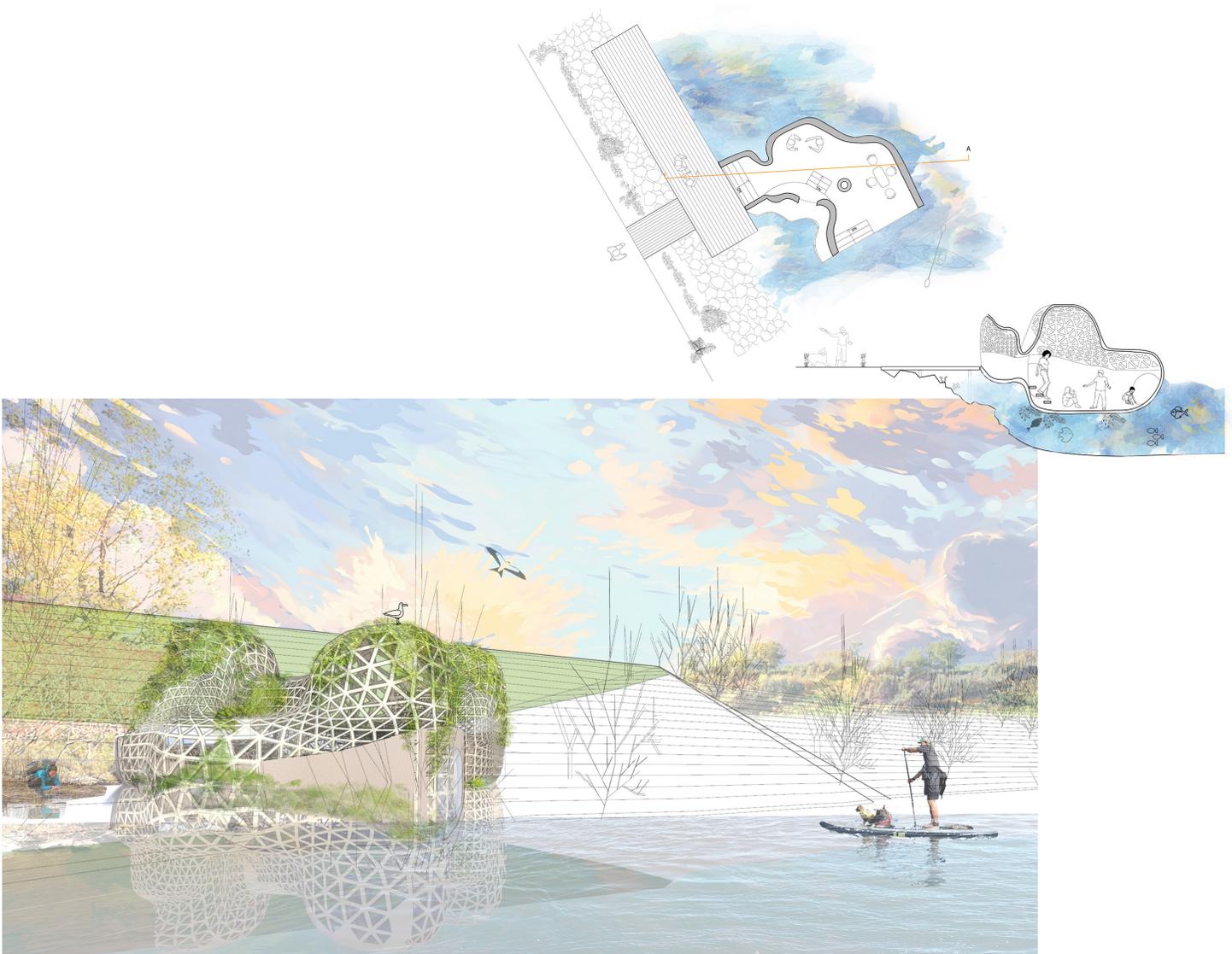
Promoting the dynamic of the edge conditions of the Ottawa River,  
the Valley of the Kiji Sibi through floating islands

Thesis Research By **Hamid Aghashahi**

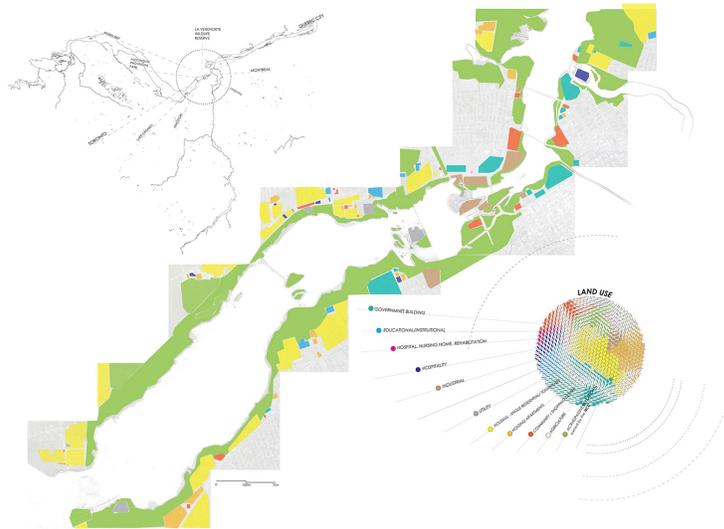
Aziell School of Architecture- Carleton University, Ottawa, Canada



**Table A.** The Ottawa River Photomontage. Drawing by author.



**Table B.** Relationship of a floating island with the edge of The Ottawa river. Drawing by author.



Rethinking the existing archipelago



1. Vignole Creeper  
Blue fern  
Pinkish blue berries

2. Moss  
Amber green

3. Reeds  
Tussocks

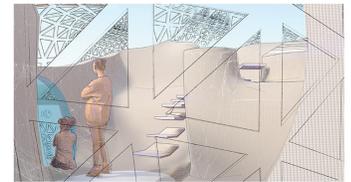
4. Blue Flag Iris  
Blue flowers  
Greenish yellow iris

5. Marsh Marigold  
Perfect for wetlands  
Shiny yellow flowers

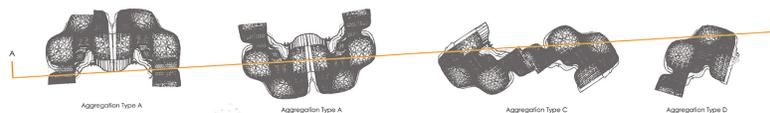
6. Marsh Marigold  
Perfect for wetlands  
Shiny yellow flowers



Morphology of Ceiling Design



A view of interior

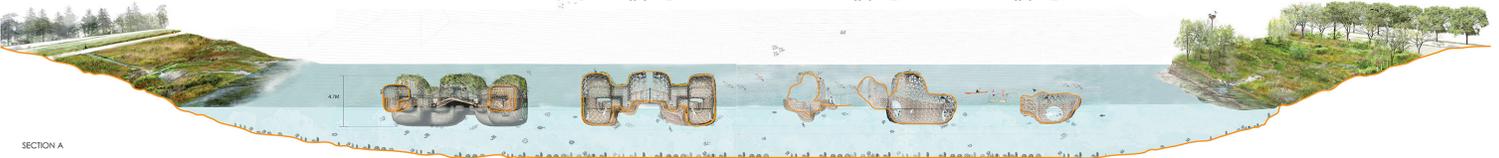


Aggregation Type A

Aggregation Type A

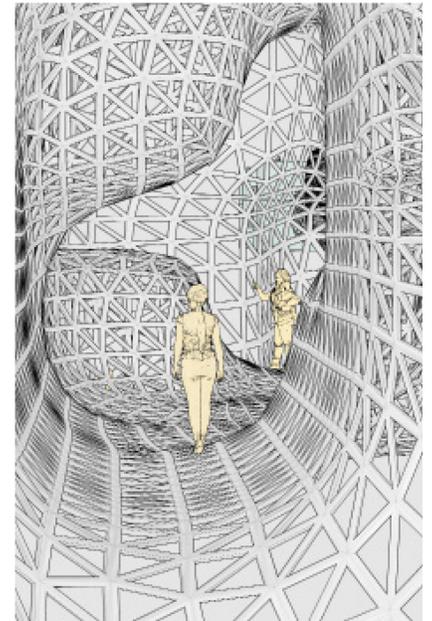
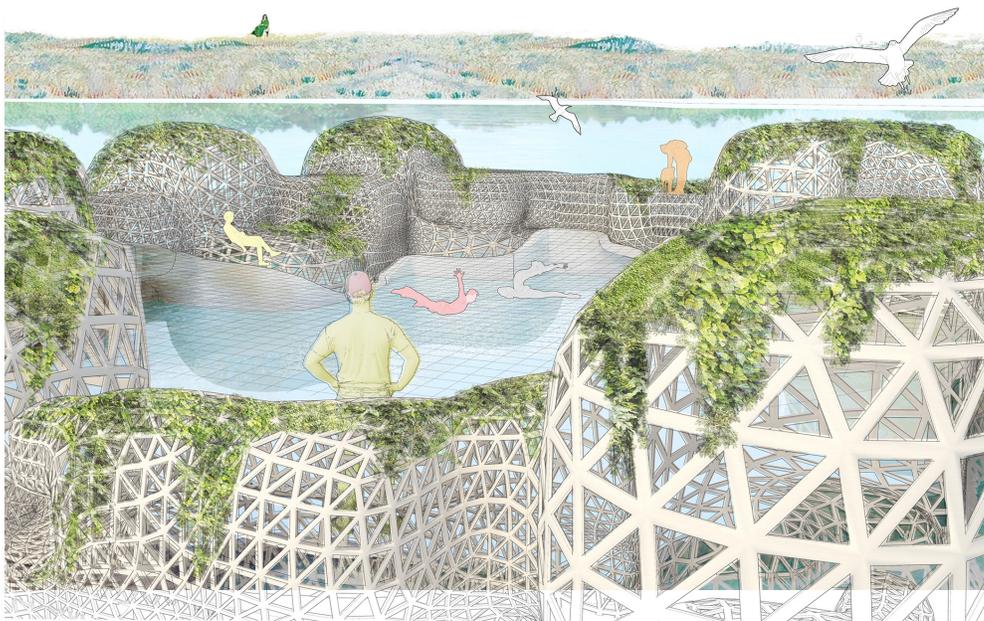
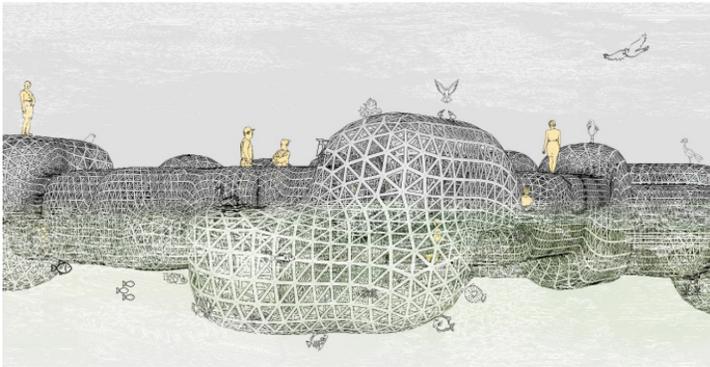
Aggregation Type C

Aggregation Type D

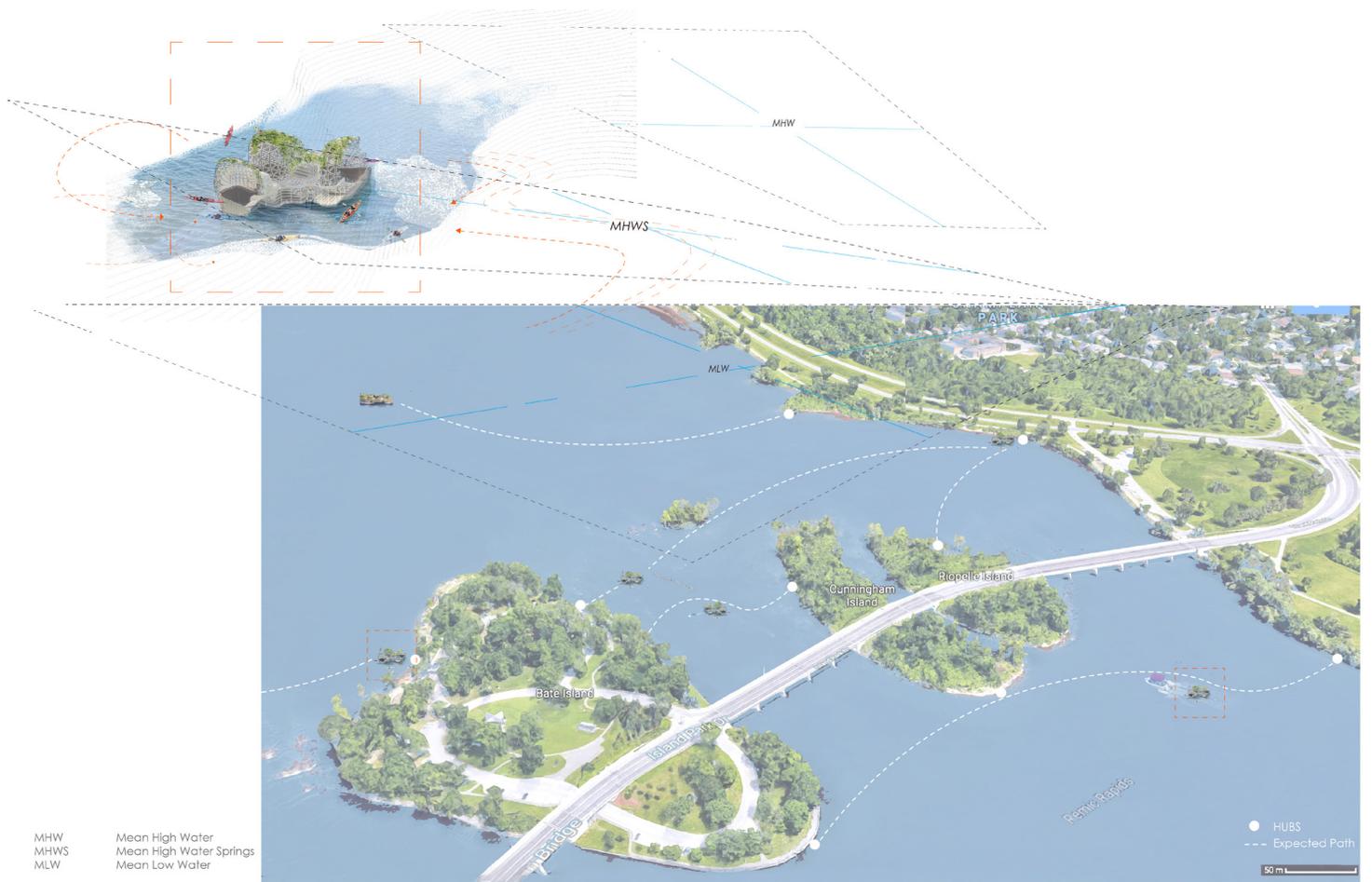


SECTION A

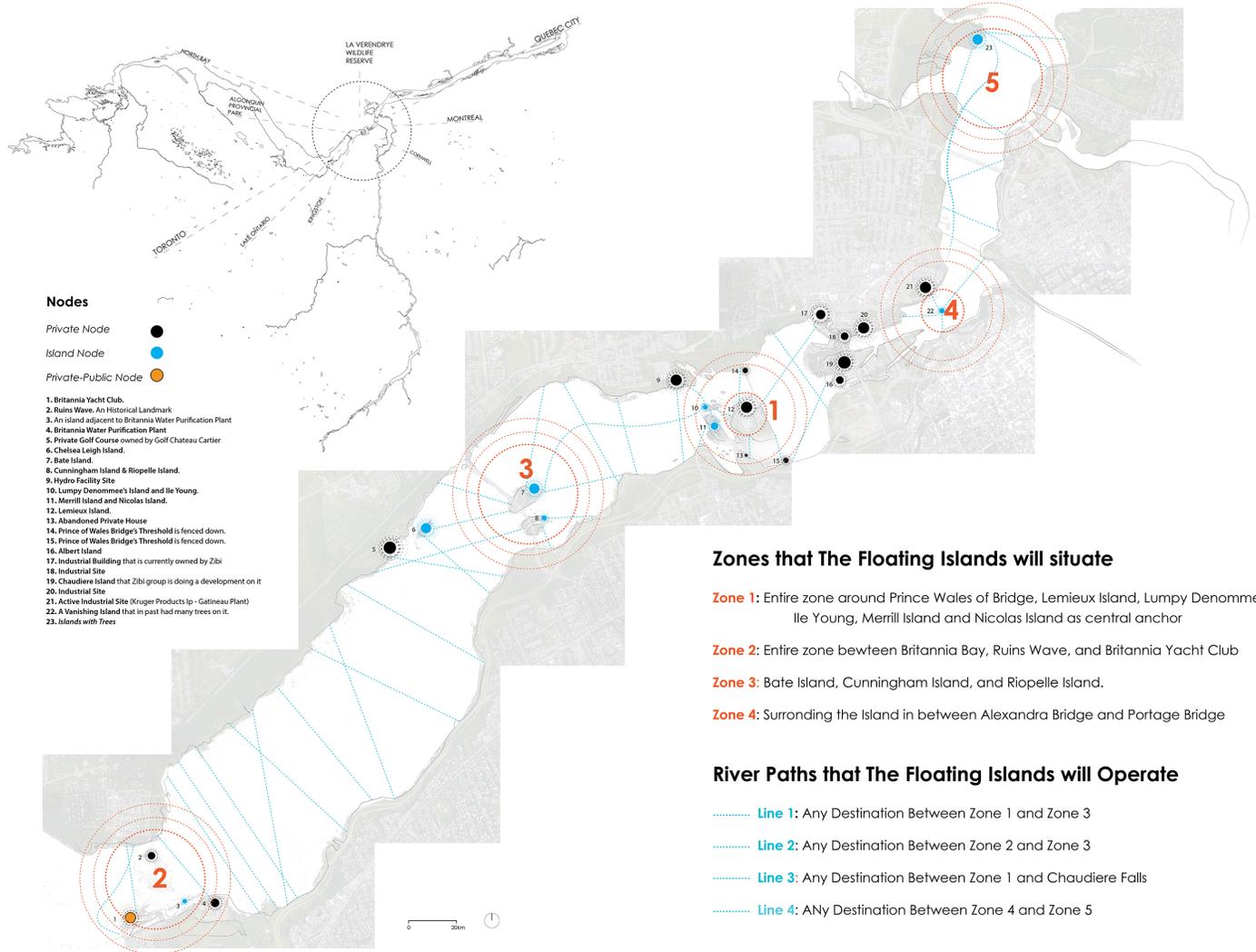
**Table C.** Land Use Map along the Ottawa River & Cross Section of the River (second half) showing different aggregation of the Floating Islands. Drawing by author.



**Table D.** Relationship of a floating island with the Ottawa river, humans and other species on the water Drawing by author.



**Table E.** Movement of the Floating Islands along the Ottawa River. Drawing by author.



**Table F.** Map of The Floating Islands. Ottawa River. Drawing by author.



**Table G.** View from Victoria Island facing East towards Parliament Hill. Drawing by author.



**Table H.** The cluster of floating islands along the archipelagos (Lumpy Denommee's Island & Merrill Island) of the Ottawa River. Photo-montage by author.

## Appendix A: *What is a River*

### Voice of the River

Rivers exist everywhere on earth. Some run above land and some run beneath land which are called “subterranean”. A river is formed by a natural stream of flowing freshwater moving towards lakes and other rivers, seas or oceans. Most rivers just like the Ottawa river flow all the time. However, there are rivers that only flow seasonally or on wet years. Some rivers can be even long enough to flow through an entire continent.<sup>53</sup>

The sources of water that becomes the rivers are rain, snow melts from the mountains, other streams called tributaries, precipitation and groundwater. According to the National Geographic,

*“Rivers are important for many reasons. One of the most important things they do is carry large quantities of water from the land to the ocean. There, seawater constantly evaporates. The resulting water vapor forms clouds. Clouds carry moisture over land and release it as precipitation. This freshwater feeds rivers and smaller streams. The movement of water between land, ocean, and air is called the water cycle. The water cycle constantly replenishes Earth’s supply of freshwater, which is essential for almost all living things.”<sup>54</sup>*

Therefore the water cycle is also known as Hydrological cycle which is the movement of water between land, ocean, and air is called the water cycle.

53 National Geographic. River.

54 Ibid.

## Appendix B: What is Watershed

### Voice of the River

*"It is a land area that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays, and the ocean. The size of a watershed (also called a drainage basin or catchment) is defined on several scales—referred to as its Hydrologic Unit Codes (HUC)—based on the geography that is most relevant to its specific area. A watershed can be small, such as a modest inland lake or a single county."<sup>55</sup>*

Some watersheds are small, and some "encompass thousands of square miles and may contain streams, rivers, lakes, reservoirs, and underlying groundwater that are hundreds of miles inland."<sup>56</sup> This explains that the watershed is the combination of water and land together.

"As the water flows, it often picks up pollutants, which may have sinister effects on the ecology of the watershed and, ultimately, on the reservoir, bay, or ocean where it ends up."<sup>57</sup> Therefore, we should think watershed not only river.

*"Not all water flows directly to the sea, however. When rain falls on dry ground, it can soak into, or infiltrate, the ground. This groundwater remains in the soil, where it will eventually seep into the nearest stream. Some water infiltrates much deeper, into underground reservoirs called aquifers."<sup>58</sup>*

Thus, based on this definition portions of water would always run into underground.

In conclusion, Rivers are part of watershed. Therefore, we need to think watershed not only rivers. Both are equally important.

55 National Ocean Service. "What is a watershed".

56 Ibid.

57 Ibid.

58 Ibid.

## The Ottawa River Watershed Facts

**“Name Origin:** Derived from the Algonquin term adawe (“to trade”). The name was given to the tribe which controlled the trade of the river. The name was first applied to the river and then to the city. The French form is Outaouais. Formerly known as Kichi Sibi, La Grande Rivière or the Grand River.”<sup>59</sup>

**“Source:** Lac des Outaouais (QC): located 250 km north from Ottawa and 290 km northwest from Montreal in the Administrative Region of Outaouais. The nearest facility is Clova, a former forestry village that’s now serving several outfitters’ lodges. Clova is also a station of the Abitibi railway (ViaRail).”<sup>60</sup>

**“Length:** 1,271 km (from source to mouth)”<sup>61</sup>

**“Loss of elevation:** The river descends approximately 400m from an elevation of 430m at the headwaters to 20m at its mouth.”<sup>62</sup>

**“Flow as measured at Carillon Dam:** Average daily flow: 1,950 m<sup>3</sup>/s, Historic daily minimum: 301 m<sup>3</sup>/sec in 1971, and Maximum daily flow: 8862 m<sup>3</sup>/sec in 2017”<sup>63</sup>

**“Area of drainage basin (watershed):** 146,300 km<sup>2</sup>. Stretches from Shining Tree in the west to St. Jerome in the east; from Westport in the south to Launay in the north; from Algonquin to Aiguebelle, from Temiscaming to Tremblay. It is twice the size of New Brunswick and larger than many countries, including Greece, Portugal, Switzerland, England, Scotia, Bulgaria, Cuba, and Denmark.”<sup>64</sup>

**“Elevation extremes:** Quebec: Pic Johannsen (935 m). Ontario: Ishpatina (693m).”<sup>65</sup>

**“Terrestrial Ecozones:** Boreal Shields and Mixedwood Plains”<sup>66</sup>

59 Ottawa Riverkeeper. “Watershed Facts”.

60 Ibid.

61 Ibid.

62 Ibid.

63 Ibid.

64 Ibid.

65 Ibid.

66 Ibid.

## Appendix C: Who are the Riverkeepers

### Voice of the River

The Riverkeepers are charitable organizations with a collective voice providing leaderships and inspiration to protect the rivers. There are many riverkeeper organizations in North America that are dedicated to protect the rivers and its tributaries.

The Ottawa River has a few riverkeeper organizations who look after the river and the main one is called the Ottawa Riverkeepers. I had an opportunity to volunteer for them during the development of this thesis. The following information is about the organization I volunteered with:

*"The Ottawa River is the source of drinking water for several million people, and it provides us with a vast playground for everything from sailing and swimming to paddlesports and fishing.*

*But all these activities depend on clean water and a healthy river system, and the threats to the Ottawa River and the waters that feed it are pressing and real.*

*We bring together volunteers, communities, businesses and all levels of government to find solutions to the problems that threaten the health of our river and its tributaries."<sup>67</sup>*



**Fig 10.0** Riverkeeper's shoreline cleanup along the Ottawa River near Parc des Rapides-Deschênes. October 27, 2018. Photography by Matthew Brocklehurst.

## **Bibliography**

Asinabka. "The Legacy Vision of William Commanda for The Sacred Chaudiere Site and The Indigenous Centre at Vistoria Island". Accessed May 25, 2019.

<http://www.asinabka.com/geninfo.htm>

Baillie, Britt, and Wendy Pullan. *Locating urban conflicts: ethnicity, nationalism and the everyday*. Cambridge: Palgrave Macmillan, 2013.

Britneff, Beatrice. "Ottawa mayor doesn't support federal budget pledge to revive plans for new interprovincial bridge". Accessed March 19, 2019.

<https://globalnews.ca/news/5073581/ottawa-mayor-federal-budget-interprovincial-bridge-plans/>

Bond, Courtney. *Where Rivers Meet: An Illustrated History of Ottawa*. Windsor, 1984.

Brault, Lucien. "Links between two cities". Ville de Hull and city of Ottawa. The Ottawa River chapter.

Chicago River Lab. "Nine leading architecture firms reinvent Chicago's second coast". Accessed January 10, 2019.

<https://www.chiriverlab.com/>

Christo Jeann Claud. "The Floating Piers". Accessed February 10, 2019.

<https://christojeanneclaude.net/projects/the-floating-piers?view=info>

Chinadaily. "Floating nests help water birds thrives". Accessed February 24, 2019.

[http://www.chinadaily.com.cn/photo/2013-07/02/content\\_16706939.htm](http://www.chinadaily.com.cn/photo/2013-07/02/content_16706939.htm)

Circle of All Nations. CIRCLE OF ALL NATIONS MESSAGE REGARDING WILLIAM COMMANDA'S LEGACY VISION FOR THE SACRED CHAUDIÈRE SITE FROM ROMOLA V. THUMBADOO. Open Letter, Ottawa: CIRCLE OF ALL NATIONS, 2014.

Citta di Venezia "Festa del Redentore 2017". Accessed February 10, 2019.

<https://www.comune.venezia.it/it/content/festa-redentore-2017>

Da Cunha, Dilip. *The Invention of rivers: Alexander's Eye and Ganga's Descnet*. Philadelphia: University of Pennsylvania Press, 2018.

Douglas Cardinal Architect Inc. "Victoria Island Indigenous Centre and International Centre for Peace." Asinabka Cultural Center. Ottawa: Douglas Cardinal Architect Inc., 2014

Ecovative blog. "Grow.Bio", 2013. Accessed April 10, 2019.  
<https://grow.bio/blogs/ecovative-blog/unveiling-the-world-s-first-mushroom-surfboards>

Escobar, Arturo. *Territories of Difference: place, movements, life, redes*. Durham and London: Duke University Press, 2008.

Girardet, Herbert. *Cities people planet: liveable cities for a sustainable world*. Academy Press, 2004.

Girardet, Herbert. *Creating Regenerative Cities*. Routledge, 2015.

Greber, Jacques. "Plan of The National Capital, Canada, 1950" NCC. Accessed Feb 02, 2019.

Grundmann, I. Lost on the Atlantic [Video file]. Retrieved from <https://topdocumentaryfilms.com/lost-atlantic/>

Hendrickson, Ole. "Sacred Site or Land Development? Competing Visions for the Chaudière Islands." Rabble. Accessed September 19, 2018.

Houle, Bethany. *Not Applicable: Preservation and Healing in regards to the Asinabka Land through Multicultural Revealing of Hidden Layers*. Ottawa: Carleton University. 2018.

La Redazione. "Tutto pronto per l'inaugurazione del ponte votivo del Redentore 2018,È tutto pronto per il Redentore 2018. Sabato l'inaugurazione dei 333 metri del ponte votivo". VENEZIATODAY. Accessed March 2, 2019.  
<http://www.veneziatoday.it/eventi/cultura/ponte-votivo-redentore-venezia-2018.html>

Leonard, Tom. "Condo development on sacred Algonquin land". International Socialists. 2016. Accessed May 29, 2019.  
<http://www.socialist.ca/node/3155>

Lowrey, Bailey. "Historical Influences of the Teatro del Mondo". 2015. Accessed November 24, 2018.  
[https://www.academia.edu/13290725/Historical\\_Influences\\_of\\_the\\_Teatro\\_del\\_Mondo](https://www.academia.edu/13290725/Historical_Influences_of_the_Teatro_del_Mondo)

Manton, Maudie. "Mashroom materials of the year 2015". Dezeen. Accessed March 2019.  
<https://www.dezeen.com/2015/03/25/mushroom-materials-ecovative-modelling-kit-mycelium-designs-of-the-year-2015/>

Marcus, A., Ikeda, M., & Jones, E. (2018, March 2). Buoyant Ecologies Float Lab. Accessed March 12, 2019.  
<https://www.architectureecologies.cca.edu/research/buoyant-ecologies-float-lab>

McGregor, Verna: *Generation Climate Conference*. Keynote presentation. March 27, 2019.

Morgan, Helen. "Abandoned German Nuclear Plant Transformed into Wunderland Kalkar Amusement Park!". inhabitat. 2014. Accessed March 2 2019.  
<https://inhabitat.com/dismantled-german-nuclear-plant-transformed-into-incredible-wunderland-kalkar-amusement-park/>

Mroz, Ewa. A conversation about her experience and memories near the Ottawa river. March 02, 2019.

Myles, Paul. "The Floating Farms of Bangladesh". BBC News. Accessed January 20, 2019.  
<https://www.youtube.com/watch?v=CONfhrASy44>

Native Art in Canada. "Harvesting and Processing Wild Rice." Accessed January 20, 2019.  
<http://www.native-art-in-canada.com/wildrice.html>

National Ocean Service. "Watershed". Accessed April 29, 2019.  
<https://oceanservice.noaa.gov/facts/watershed.html>

Ncc-Ccn.ca. "About Us." NCC. Accessed 19 March, 2019.  
<http://ncc-ccn.gc.ca/about-us>

Ottawa RIVERKEEPER, "History of the Ottawa river". Accessed November 10, 2018.  
<https://www.ottawariverkeeper.ca/home/explore-the-river/history/>

Ottawa RIVERKEEPER. Summary of the 2017 Flood. Accessed November 10, 2018.  
[https://www.ottawariver.ca/docs/2017\\_Spring\\_Flood\\_Summary.pdf](https://www.ottawariver.ca/docs/2017_Spring_Flood_Summary.pdf)

Ottawa RIVERKEEPER, "Watershed Facts". Accessed April 29, 2019.  
<https://www.ottawariverkeeper.ca/watershed-fact/>

Ottawa RIVERKEEPER, "Who we are". Accessed April 29, 2019.  
<https://www.ottawariverkeeper.ca/home/who-we-are/>

Palazzo Barbarano. "Architecture is science Vincenzo Scamozzi (1548-1616)". Palladiomuseum. Accessed November 10, 2018.  
<https://www.palladiomuseum.org/exhibitions/scamozzi2003/schede/10>

Palladiomuseum. "Architecture is science Vincenzo Scamozzi (1548-1616)". Accessed December 10, 2018.  
<https://www.palladiomuseum.org/exhibitions/scamozzi2003/schede/10>

Practical Action. "Primary Secondary CREST STEM Challenge Floating Garden Challenge". Accessed January 22, 2019.  
<https://practicalaction.org/floatinggardenchallenge>

Radovic, Darko. *Eco-Urbanity: Towards Well-Mannered Built Environments*. London, England: Routledge, 2013.

Rojo, Jaime. "How Floating Nests May Save One of the World's Largest Water Birds". Accessed February 15, 2019.  
<https://www.smithsonianmag.com/science-nature/how-floating-nests-may-save-one-worlds-largest-water-birds-180957439/>

Rosenfield, Karissa. "Heatherwick Releases Updated Images for London's Garden Bridge", Archdaily. Accessed March 20, 2019.

Stoppani, Teresa. *Paradigm Islands: Manhattan And Venice*. Routledge, 2011.

Sheppard, L., & White, M. (2017). *Many Norths: Spatial Practice in a Polar Territory*. New York: Actar.

Tanakiwin, "Our Proud History, Algonquins of Ontario". Accessed November 12, 2018.  
<https://www.tanakiwin.com/algonquins-of-ontario/our-proud-history/>

The Canadian Encyclopedia. "Ottawa River". Accessed November 10, 2018.  
<https://www.thecanadianencyclopedia.ca/en/article/ottawa-river>

Torem, Emily. "CHICAGO RIVER HABITAT RESTORATION: FLOATING GARDEN ISLANDS UPDATE". 2017. Accessed February 10, 2019.  
<http://moss-design.com/chicago-river-floating-islands/>

University of Ottawa Faculty of Medicine. "Indigenous health. University of Ottawa. Accessed May 4, 2019.

[http://www.med.uottawa.ca/SIM/Data/Vul\\_Indigenous\\_e.htm](http://www.med.uottawa.ca/SIM/Data/Vul_Indigenous_e.htm)

Watson, Jim. "Letter - Minister Garneau - CTA - March 6, 2018 - En". Accessed Feb 02, 2019.

<https://www.scribd.com/document/373148125/Letter-Minister-Garneau-CTA-March-6-2018-En>

West, Kara and Jannie Evers, Eds. March 2011. "River." *National Geographic*.

<https://www.nationalgeographic.org/encyclopedia/river/>, accessed May 02, 2018.

Willing, Jon. "City told it needs to repair Prince of Wales Bridge within 12 months". Ottawa Citizen. Accessed March 24, 2019.

<https://ottawacitizen.com/news/local-news/city-told-it-needs-to-repair-prince-of-wales-bridge-within-12-months>

