

Adapting to Climate Change: Coastal Flooding Shippagan



Figure 1:
Location of Shippagan

The Area

Shippagan Les Îles is an archipelago of three islands (Shippagan, Lamèque and Miscou) located on the Acadian Peninsula in northeastern New Brunswick. On the western shore of the islands is the Baie des Chaleurs and the Gulf of Saint Lawrence is on the eastern shore.

Home to New Brunswick's largest fishing fleet, Shippagan (pop. 2603 in 2011) is known as "New Brunswick's Commercial Fishing Capital."

Thousands of acres of peat bog provide employment for residents through primary extraction and processing. The peat research section of the Coastal Zones Research Institute in Shippagan serves as an essential tool for the development of the peat industry.

Climate Change and Community Vulnerability

Local residents have noticed an increase in the frequency and intensity of extreme weather, including storm surges and flooding, and are worried about future impacts on their homes and livelihoods.

The Town of Shippagan is concerned about the state of its infrastructure in relation to more extreme weather events, particularly related to storm sewers, the bridge and saltwater intrusion into groundwater.

Local Climate Change Adaptation to Date

In 2005, the Town of Shippagan began work on its strategic plan for 2007-2012. One of the outcomes was to create a green plan. A committee was formed in 2008 and the Coastal Zones Research Institute was hired to complete the green plan. After public consultation sessions, the green plan was completed in 2009. The green plan identified 7 strategic sectors and a proposed short-term work plan for 49 actions to take place over 3 years.

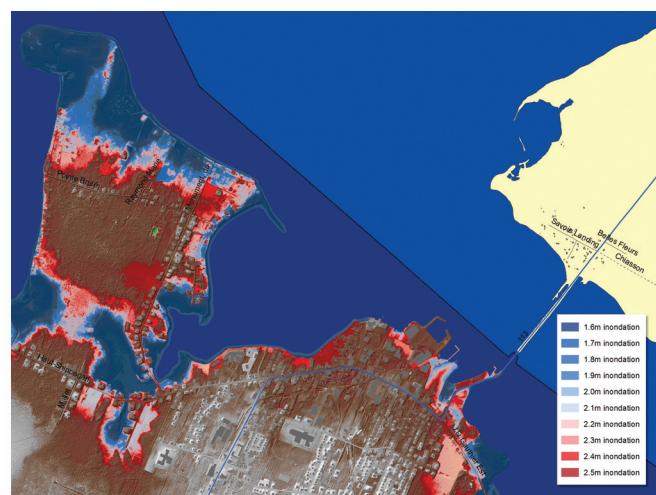


Figure 2:
1.6 to 2.5 m flood scenarios due to storm surges.

R. McLean, DOELG

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The town's most recent storm sewer constructions included discharge check valves and the bridge has been repaired and reinforced. Work on the sanitary sewer system took place to increase the capacity of wastewater collection to reduce outlets into Shippagan Bay. The pumping capacity was increased in two stations.

In 2010, Shippagan participated in the Acadian Peninsula project, undertaken as part of the Acadian Peninsula-Atlantic Climate Adaptation Solutions Association (ACASA) project under the Atlantic Regional Adaptation Collaborative (ARAC) initiative. The purpose of the project was to develop planning and decision-support tools to help municipalities deal with issues of coastal flooding and erosion more effectively. Using a digital elevation model as the foundation, coastline retreat projections, flood scenarios and analysis of the risk to infrastructure were conducted. Sea level rise and storm surge scenarios were developed by R.J. Daigle Enviro. Coastline retreat scenarios were developed by Dr. Serge Jolicoeur (Université de Moncton/Moncton campus) and Stéphane O'Carroll (GIS Specialist). The analysis of risk to infrastructure was conducted by a team from the Université de Moncton (Shippagan campus), led by Dr. André Robichaud, and Inuk Simard, a GIS specialist. The tools that were developed comprise a high-precision digital elevation model based on LiDAR data, sea-level rise and storm surge projections, coastline advance and retreat projections and a database of infrastructure at risk according to various coastline flooding and retreat scenarios. These tools were used to produce maps illustrating the areas at risk of flooding or erosion in future.

Dr. Mélanie Aubé of the Coastal Zones Research Institute Inc. and Benjamin Kocyla of the Commission d'aménagement de la Péninsule acadienne facilitated a citizen-based working group to examine and validate the tools. This group made recommendations to the municipal council in regards to risk management and land-use planning. The group recommended that the sea level rise scenario for 2055, the 100-year return period storm surge scenario and the coastline retreat scenario for 2100 should be used for planning. The group further made the following recommendations:

- 1 Two risk zones based on these scenarios should be added to the municipal plan;
- 2 The Town of Shippagan's development plan should be amended to include zoning aimed at minimizing flood and erosion risk, as well as conditions regarding the uses and expansion of existing buildings and the uses and construction of new buildings;
- 3 The Town of Shippagan should call for an integrated approach regarding the use of protective structures;
- 4 Flood and erosion risk information should be made available to emergency measures coordinators;
- 5 The emergency measures plan or information on measures to be taken in the event of an emergency, and particularly on measures to be taken in the case of flooding, should be made available to the public;
- 6 The working group's recommendations and information on areas at risk of flooding and erosion should be made available to the public, e.g., at ad hoc public meetings, in writing (note or memo) or through the media; and
- 7 A communications plan should be developed.

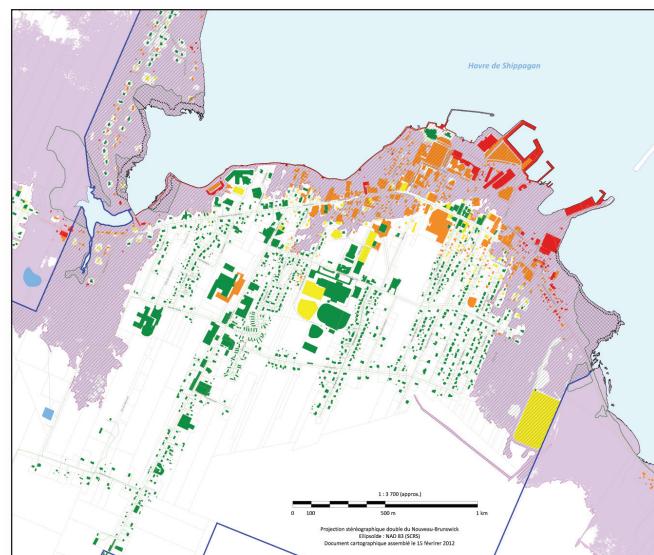


Figure 3: Recommended zoning to reduce coastal flood and erosion risk.

A. Robichaud et coll., UMCS

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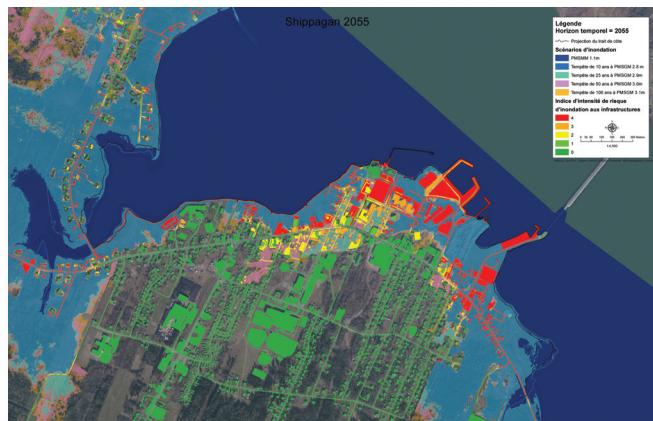


Figure 3: Infrastructure at risk, various flood scenarios.

A. Robichaud et coll., UMCS

Next Steps and Opportunities

Planners and decision-makers now have a database, maps and proposed zoning with which to move forward in Shippagan. Municipal decision makers have gained knowledge about climate change and its effects, have gained maps to guide their decisions, and both their capacity to understand and their capacity to act is increased.

Led by Dr. Aubé from the Coastal Zones Research Institute Inc., work continues with the working group and in the community to begin implementing the recommendations and to start a community engagement process.

Many small communities lack the resources to develop and implement a comprehensive climate change adaptation plan. In Shippagan, policy makers were able to rely on nearby researchers from l'Université de Moncton and the Coastal Zones Research Institute Inc. to provide impacts and adaptation information, to facilitate a discussion process and to draft a plan based on the outcomes from the discussions. This example demonstrates the importance of collaboration between local residents and climate change specialists and shows how community capacity can be built to achieve results for the benefit of the community.

Reports

M. Aubé and B. Kocyla. *Climate Change Adaptation: Land-use Planning in Shippagan, Le Goulet and Bas-Caraquet*

S. Jolicoeur and S. O'Carroll. *Rapport de recherche technique. Équipe «Photogrammétrie et cartographie».*

A. Robichaud, I. Simard, A. Doiron and M. Chelbi. *Infrastructures à Risques dans Trois Municipalités de la Péninsule Acadienne.*

For More Information

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