

Adapting to Climate Change: Infrastructure at Risk

City of Moncton



Figure 1:
Location of Moncton

The Area

Moncton (pop. 69,074 in 2011) is part of the Greater Moncton Area (GMA, pop. 138,644 in 2011), a highly urbanized area comprising the City of Moncton, the City of Dieppe and the Town of Riverview. The city has gained the nickname "Hub City" because of its central location and also because Moncton has historically been the railway and land transportation hub for the Maritimes. The city's economy is stable and diversified, primarily based on its traditional transportation, distribution, retailing and commercial heritage, but also supplemented by strength in the educational, health care, financial, information technology and insurance sectors. The strength of the economy has received national recognition and the local unemployment rate is consistently less than the national average.

The Greater Moncton Area is located in south-eastern New Brunswick, at the head of the Bay of Fundy, and is bisected by the Petitcodiac River. The GMA and its surrounding communities experience flooding from both tidal surge in the Bay of Fundy, from the Petitcodiac River, and other watercourses due to extreme precipitation events.

Climate Change and Community Vulnerability

Significant areas of low-lying marshland and wetlands exist within the three municipalities. The area experiences coastal flooding from the Bay of Fundy and inland flooding from extreme precipitation events. Infrastructure and wastewater management problems are experienced during heavy rainfall events. High tides and storm surges from the Petitcodiac River cause damage to properties and infrastructure along their banks.

The major consequence of future climate change projected for the Greater Moncton Area is the rise in sea level over time. As sea level rises, tides will increase and potentially threaten existing infrastructure and property. The Greater Moncton Area is situated on the shores of the Petitcodiac River and its tributaries, which behaves as a tidal estuary at this point in its flow toward the ocean.

Increases in water levels in the Petitcodiac estuary could have a major impact on transportation infrastructure and essential public services in low-lying lands near the river and its tributaries. Many major transportation routes connecting essential services to residential, commercial, and industrial areas would be flooded by projected future storm events.

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Local Climate Change Adaptation to Date

The City of Moncton is experiencing higher occurrences of flooding from the coast, inland watercourses and extreme precipitation events. In 2010, the cities of Moncton and Dieppe and the town of Riverview joined in the Atlantic Regional Adaptation Collaborative (ARAC) program aimed at developing solutions to climate change impacts specifically for their municipal water, waste water, and road infrastructure, but also for any further infrastructure development within the municipalities.

The environmental consulting firm AMEC Environment & Infrastructure was retained to complete the climate change adaptation study for the Greater Moncton Area. The objectives of the study were to provide the GMA with a flood risk assessment based on the potential impacts of climate change, to identify vulnerable infrastructure, to recommend adaptation measures and assist municipal and provincial officials in considering the necessary changes to municipal plans and infrastructure programs. The study results will be used by the municipalities as a planning tool. The approach adopted for this work is intended to make the uncertainty arising from climate models as apparent as possible so as to allow well-informed judgements regarding future planning.

Projected intensity-duration-frequency (IDF) curves, used as the basis for design of drainage and flood defense infrastructure, were developed. The time frames specified for the projections were 2025, 2055, 2085 and 2100. The flooding assessment was based on the calculation of total water level in the Petitcodiac River and estuary at a given future time.

The study concentrated on infrastructure of primary concern, such as roads and bridges, storm drainage systems (ditches and storm sewers), sanitary sewer collection and treatment systems and water supply and distribution systems.

With a focus on model flood plain mapping and attendant regulations, the study made general governance recommendations for roles that the City can play in climate change adaptation.

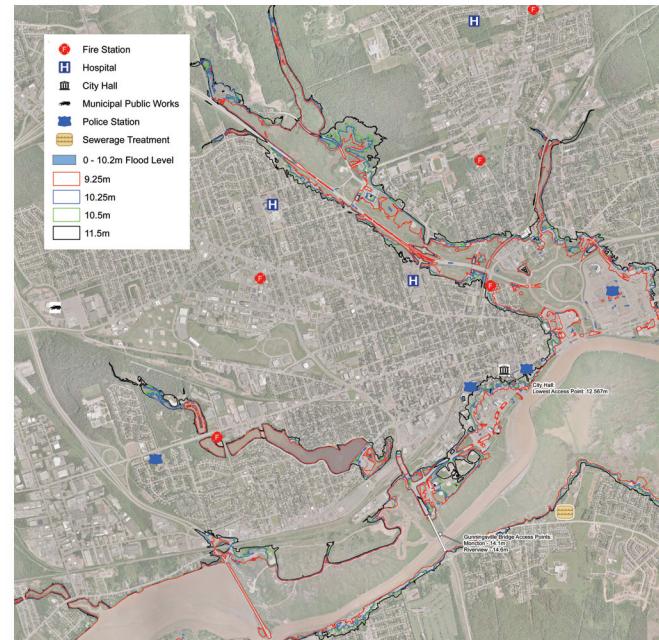


Figure 2: LiDAR derived DEM with a 0-7 m coastal flood scenario.

[AMEC Summary Report](#)

Next Steps and Opportunities

The research study provided an evaluation of current transportation, sewage, drainage and flood defense infrastructure based on potential impacts of climate change and provided municipal and provincial officials with information on how to address adaptation in a densely built environment.

Meteorological, tidal and flood risk assessments have been completed. Hydrological mapping is in progress.

City planners will now be able to develop a strategy and policy framework for addressing development in flood prone areas, develop floodplain maps and associated regulations and update Moncton's zoning and municipal plan. Municipal staff will be able to develop appropriate policies; upgrade design standards for municipal infrastructure; review by-laws governing flood protection standards; inform and educate the public and develop an emergency response.

Council received the report from AMEC in the fall of 2012, and municipal staff were directed to develop an implementation plan and flood risk management strategy and present details in 2013.

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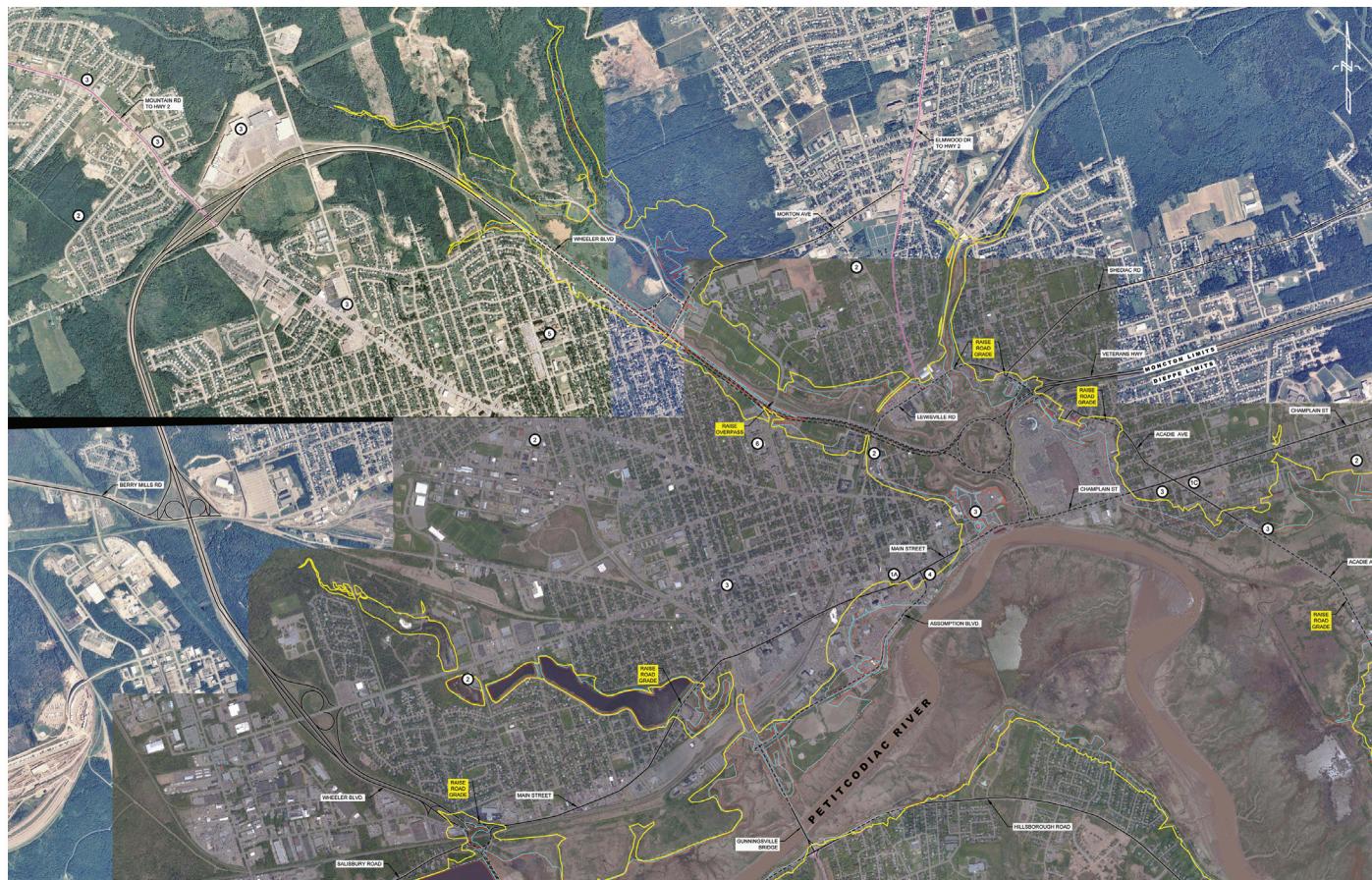


Figure 3: Potential impact on the road infrastructure.

AMEC Report

For More Information

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