? UNDERLYING QUESTIONS

What are the different types of risk associated with climate change?
What are the impacts of these risks on water infrastructure service levels?

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Identifying the risks to which a municipality's water assets are exposed is the first step in assessing its resilience to those risks. In this case, the focus is on hazards associated with known weather events, as well as on predictions and projections based on long-term trends associated with climate change, particularly in terms of the increase in precipitation and heavy rainfall events.

POTENTIAL SOLUTIONS

The risks to be considered can be identified in different ways:

A History of events and consequences observed

This category explores the history of precipitation and climate data of a given territory to draw up a portrait of major climate events, particularly in relation to the increase in heavy precipitation events. This will allow for the adjustment of, among other things, design criteria based on past observations.

B Projected risk assessment

In addition to historical data, it is important to consider climate change projection data. A number of organizations at the national and provincial levels provide data to help provide an overview of the climate changes expected in the coming years for a given territory.

C Vulnerability assessment

In addition to climate data, it is also important for a municipality to have full control of its water assets in order to be able to determine those that may be vulnerable to, and therefore impacted by, the risks identified in A and B.

REFERENCES

Ouranos | Synthesis on Climate Change Knowledge in Québec (2015)	**A**	**B**	**C**

An authoritative reference in Quebec for climate change and its impacts. The document is divided into three parts: 1) climate change in Quebec; 2) vulnerability, impacts and adaptation to climate change; and 3) implementing adaptation measures. The second part is particularly relevant to the assessment of vulnerability related to the increase in heavy precipitation events.

MAMH | Fiches synthèses régionales d'adaptation aux changements climatiques (2020) [in French only]	**A**	**B**	**C**

An extensive climate portrait of Quebec's administrative regions.

Each guidance sheet presents a summary table of climate projections for the region, an overview of the potential impacts of climate change on certain sectors of activity, and examples of adaptation measures implemented in the region for each of these sectors. A table showing how climate change adaptation measures can be integrated into existing municipal planning tools is also presented.

ROBVQ | Autodiagnostic municipal en gestion durable des eaux pluviales (2017) [in French only]	**A**	**B**	**C**

A self-assessment tool, in the form of an automated online questionnaire, to promote sustainable stormwater management and best practices by identifying a municipality's strengths and weaknesses.

Ouranos | Climate Portraits (2016)	**A**	**B**	**C**

An interactive map showing the effects of climate change in Quebec according to different parameters (e.g., studied variable, time horizon, GHG emission projections).

The map can be used to target a specific region or territory for analysis and provides several parameters to visualize precipitation projections (e.g., time horizon, climate change assumptions).

PIEVC | The PIEVC Protocol for Assessing Public Infrastructure Vulnerability to Climate Change Impacts (2022)	A	B	C

An authoritative reference in Quebec for climate change and its impacts. The document is divided into three parts: 1) climate change in Quebec; 2) vulnerability, impacts and adaptation to climate change; and 3) implementing adaptation measures. The second part is particularly relevant to the assessment of vulnerability related to the increase in heavy precipitation events.

FCM | Case Studies: Using Data to Address Water Infrastructure Vulnerabilities (2020)	A	B	C

A series of case studies prepared by FCM on the adaptation to climate change by various Canadian municipalities. Of particular interest is the case of the Municipality of Kenora, in which the methodology used to identify the risk of damage to assets in the context of climate change is presented.