RESILIENCE COMPONENT

RISK IDENTIFICATION AND AWARENESS

STEP 1

HAZARD DROUGHT

UNDERLYING QUESTIONS

GUIDANCE

What are the different types of risks? What are the impacts of climate change on service levels?

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 intense heat and prolonged drought. These have an impact on many aspects of water management and water infrastructure, including drinking water.

POTENTIAL SOLUTIONS

Rising temperatures and longer drought periods are impacting water assets on several fronts, including drinking water management. The risks to be considered can be identified in different ways:

History of events and consequences observed

This first 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. When applied to water assets, the history of water table levels can also be analyzed.

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 outlining the climate changes expected in the coming years for a given territory.

Vulnerability study

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.



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REFERENCES

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Ulaval | Cartographie de vulnérabilité aux fortes précipitations et aux chaleurs extrêmes aux Québec (2018) [in French only]

Mapping of Quebec municipalities showing their vulnerability to extreme heat and heavy precipitation in the context of climate change. **Section 2.4.1.3, Heat waves**, deals more specifically with drought events and presents the problems several municipalities have experienced as well as the solutions they have implemented.

MELCC Guide de réalisation des analyses de la vulnérabilité des sources			
destinées à l'alimentation en eau potable au Québec (2018)	Α	В	С
[in French only]			

A guide for those in charge of groundwater or surface water abstraction who need to carry out vulnerability analyses of their sources, as well as for the various professionals and specialized workers who will be assisting them. The guide highlights the weaknesses, problems and threats affecting drinking water supply. It identifies priorities for action to reduce threats or develop an appropriate emergency response plan.

The Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs also provides municipalities and professionals with work templates to structure the information collected. This also makes it easier to compare different municipalities.

MAMH | Fiches synthèses régionales d'adaptation aux changements
climatiques (2020) [in French only]ABC

The Ministère des Affaires municipales et de l'Habitation has prepared an extensive climate portrait of Quebec's administrative regions. This portrait is in the form of guidance sheets, each of which 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 section on how climate change adaptation measures can be integrated into existing municipal planning tools is also presented.



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

А В С

This protocol reviews historical climate information and projects the nature, severity and probability of future climate changes and events. It also establishes the adaptive capacity of an individual infrastructure as determined by its design, operation and maintenance. It includes an estimate of the severity of climate impacts on the components of the infrastructure (e.g., deterioration, damage or destruction) to enable the identification of higher-risk components and the nature of the threat from the climate change impact.

FCM | Case Studies: Using Data to Address Water Infrastructure Vulnerabilities (2020) АВС

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 *Union Water Supply System* (UWSS), which supplies drinking water from Lake Erie to residents of the Municipality of Leamington and the towns of Kingsville, Essex and Lakeshore. The case describes the vulnerability of the drinking water system to algal blooms and drought.