



Ottawa River  
Regulation  
Planning Board

Commission de planification  
de la régularisation  
de la rivière des Outaouais

# Flow Management in the Ottawa River Basin





# PRESENTATION OUTLINE

## Part A: The Ottawa River Basin and the Planning Board

- Facts about the Ottawa River basin
- Mandate of the Planning Board

## Part B: Limits to Principal Reservoir Effects

- Mostly a natural river during spring floods
- Issues of common concern

## Part C: Dams in the Basin

- Types of structures
- Natural river constrictions

## Part D: Information available to you

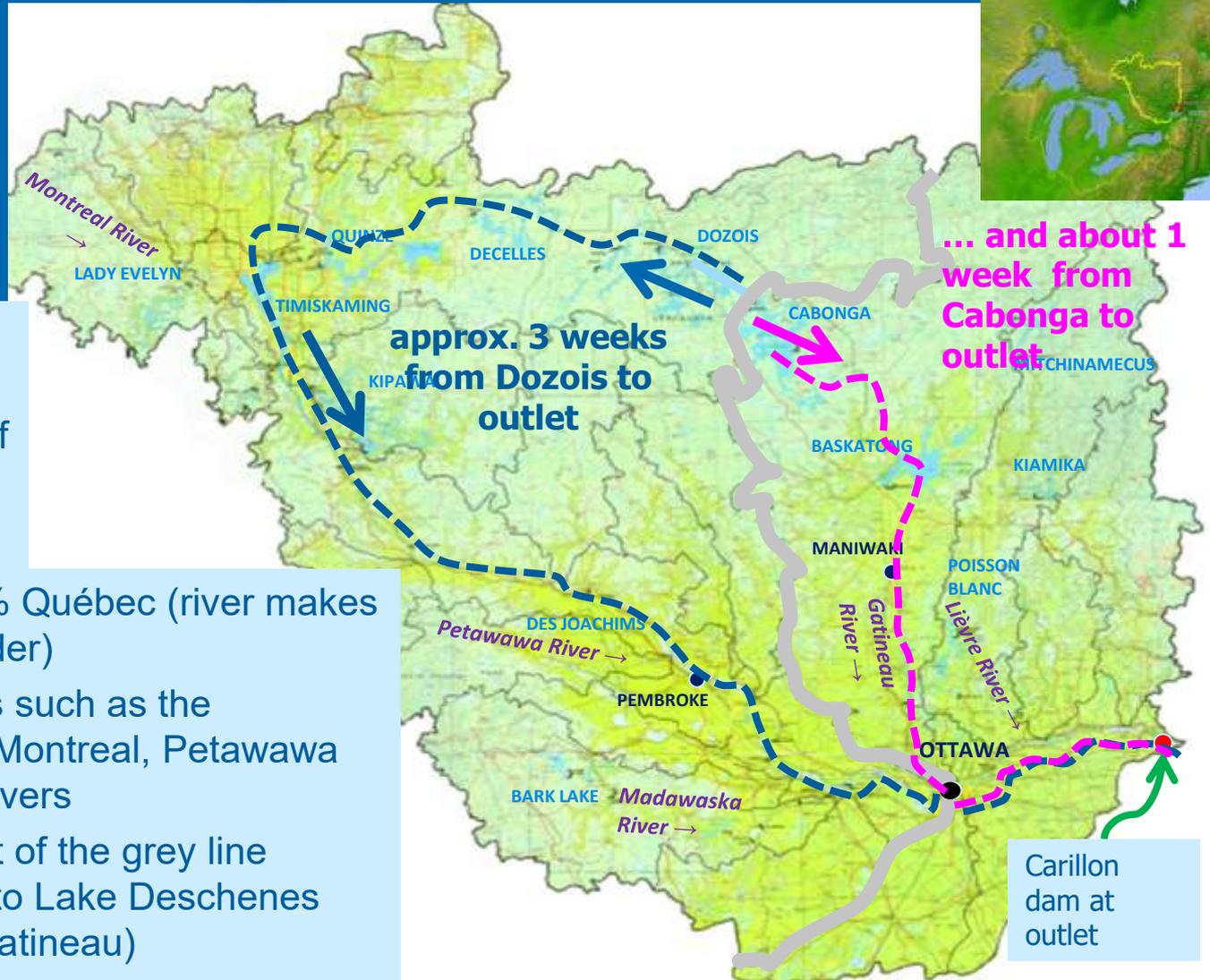
- ORRPB website
- Stay informed

# **PART A**

## **THE OTTAWA RIVER BASIN AND THE PLANNING BOARD**



# Ottawa River Watershed

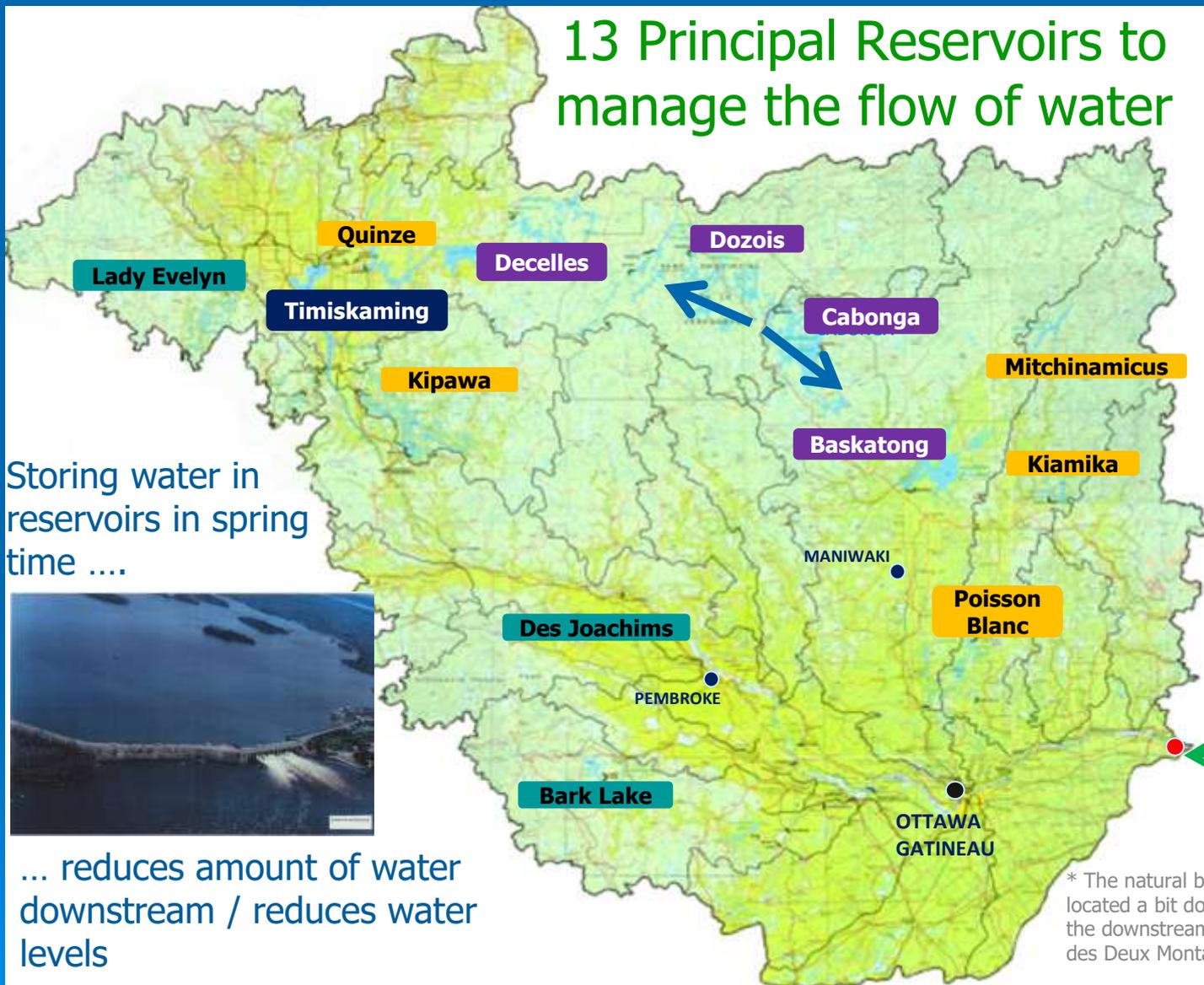


- Larger than England
- Largest tributary of the St. Lawrence River
- 35% Ontario / 65% Québec (river makes up majority of border)
- Over 15 tributaries such as the Gatineau, Lièvre, Montreal, Petawawa and Madawaska rivers
- Only the land west of the grey line contributes water to Lake Deschenes (west of Ottawa-Gatineau)

Carillon dam at outlet



# 13 Principal Reservoirs to manage the flow of water



ONTARIO POWER GENERATION

Gouvernement du Canada

Hydro Québec

Québec

Storing water in reservoirs in spring time ....



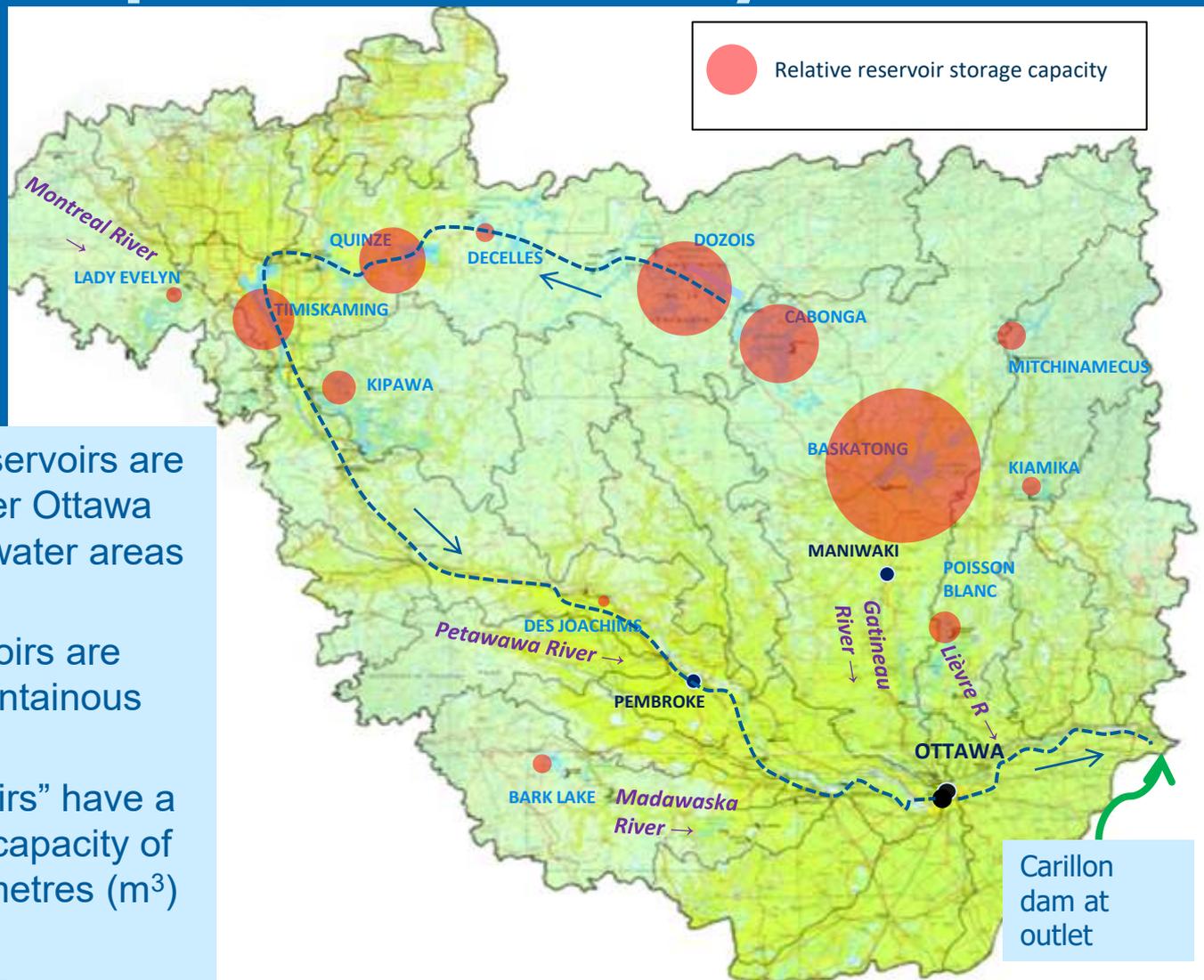
... reduces amount of water downstream / reduces water levels

Outlet at Carillon dam\*

\* The natural basin outlet is located a bit downstream at the downstream end of Lac des Deux Montagnes



# Principal Reservoirs vary in size



- Most Principal Reservoirs are located in the upper Ottawa River and in headwater areas of its tributaries
- The largest reservoirs are located in the mountainous areas of the basin
- “Principal Reservoirs” have a minimum storage capacity of 200 million cubic metres (m<sup>3</sup>)

Carillon dam at outlet



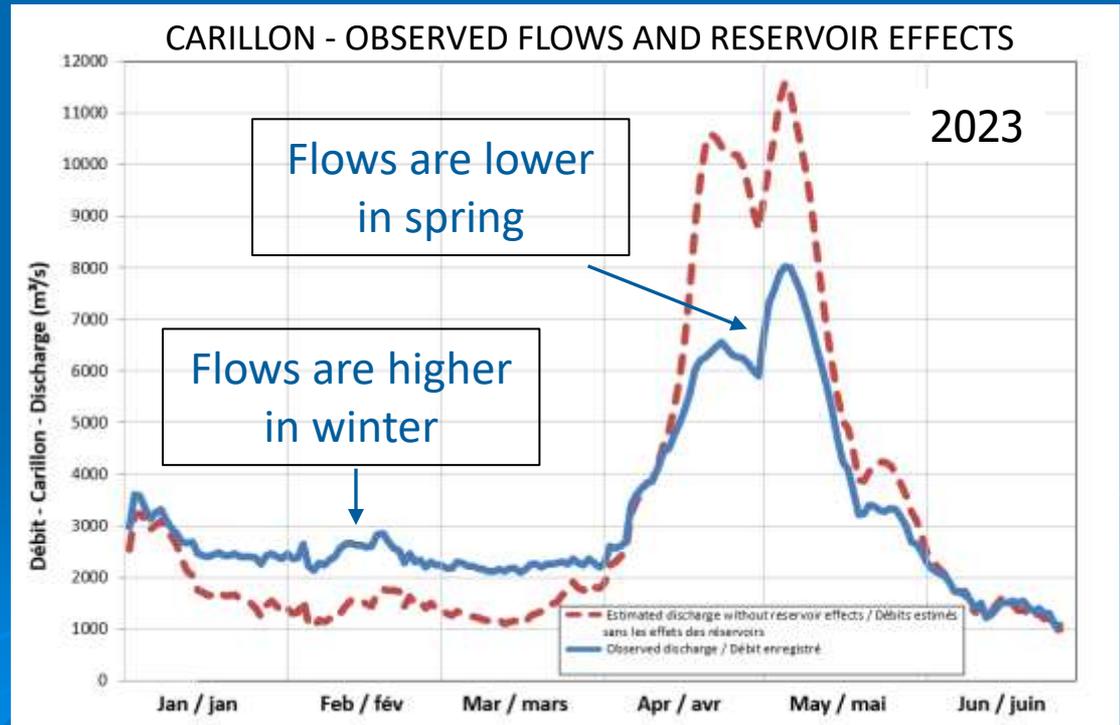
# Something special about the Ottawa River

Principal reservoirs are used to partially regulate flows in the Ottawa River.

This partial regulation alters the natural flow pattern of the Ottawa River by:

- Reducing flows and flooding during the spring freshet (when reservoirs are filling with spring runoff)
- Augmenting flows in winter (when water is released from principal reservoirs)

*To learn about 'discharges' that are illustrated on the figure, refer to the annex*





# Planning Board Main Objectives

The 1983 Canada-Ontario Quebec Agreement established:

- Ottawa River Regulation Planning Board (the Planning Board)
  - Ottawa River Regulating Committee (the Committee)
  - Ottawa River Regulation Secretariat (the Secretariat)
- *Main role* : to ensure that the flow from the principal reservoirs of the Ottawa River Basin are managed on a collaborative basis to minimize impacts of floods & droughts
- *Secondary role* : to ensure hydrological forecasts are made available to the public and government agencies for preparation of flood related messages



# Collaborative Agreement



\* The Ontario Ministry of Natural Resources is an associate member as it contributes important hydrometeorological information and plays a key role in disseminating information in Ontario.



# Planning Board Members

## Quebec

Ministère de  
l'Environnement, de la  
Lutte contre les  
changements climatiques,  
de la Faune et des Parcs  
(MELCCFP)

Hydro-Québec

## Canada

Public Services  
and Procurement  
Canada

Canadian Coast Guard

Environment and Climate  
Change Canada (ECCC)

## Ontario

Ministry of Natural  
Resources (MNR)

Ontario Power  
Generation

- 
- Planning Board reports to three parties that signed the 1983 Agreement
    - Ministers of MELCCFP, ECCC and MNR.



# Planning Board Main Objectives

The Planning Board is not a “control board”.

- It facilitates the collaborative management of reservoirs by operators.
- It cannot direct how operators manage their reservoirs or facilities.
- Each operator remains responsible for the operational strategies and decisions at their facilities.
- The Board sets common goals for the operators of principal reservoirs to work towards.

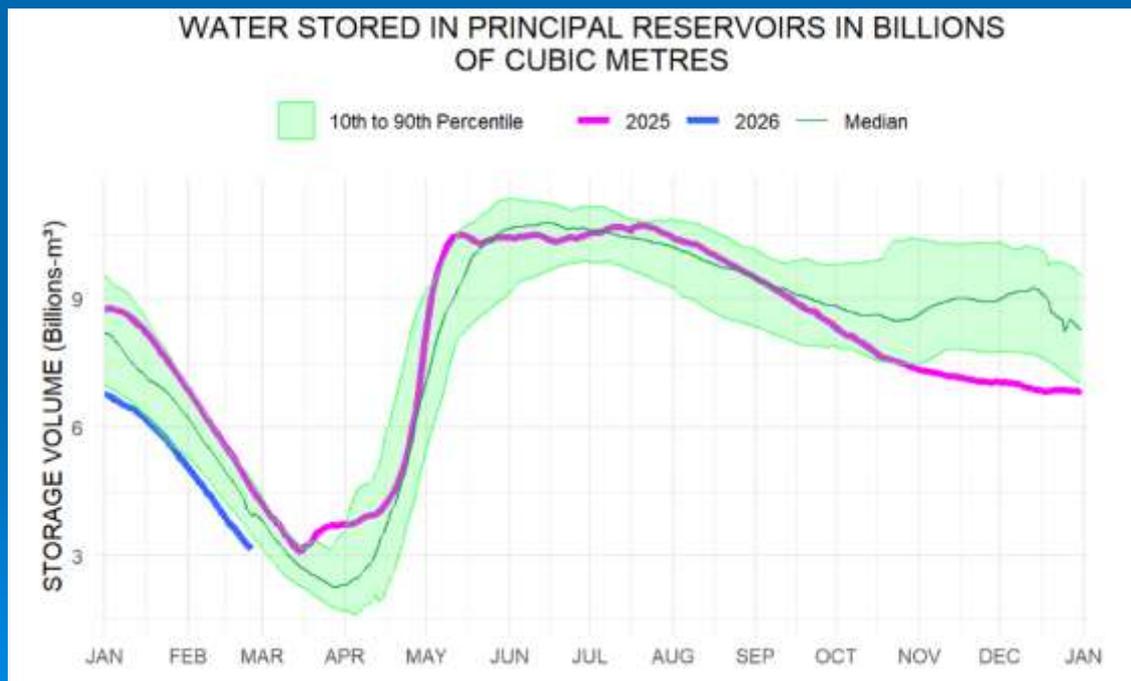
Operators work together to manage their principal reservoirs.

- They share the goal of minimizing impacts related to flooding.
- To limit the impact of flooding, they empty the reservoirs as much as possible before the beginning of the spring thaw. They then close the gates of their facilities to hold back as much water as possible for as long as possible.
- The reservoirs only make it possible to control 40% of the area of the Ottawa River watershed. Flooding occurs when the quantity of water generated by snowmelt and spring rain is significant and exceeds the capacity of the reservoirs in the north.



# Work of the Committee and Secretariat

- Continuous monitoring of conditions in the basin, the river and its tributaries
- Gradual drawdown of the principal reservoirs ( December to end of March)
- Optimize reservoir refill timing to reduce flooding impacts (during spring) while ensuring reserve to mitigate possible droughts



- Uses weather forecasts to predict river conditions weekly throughout the year and daily during freshet
- Adjust release of water from reservoirs to optimize benefits and reduce risks
- Makes river conditions forecasts available to responsible authorities

# **PART B**

## **LIMITS TO PRINCIPAL RESERVOIR EFFECTS**



The Ottawa River behaves mostly like a natural river

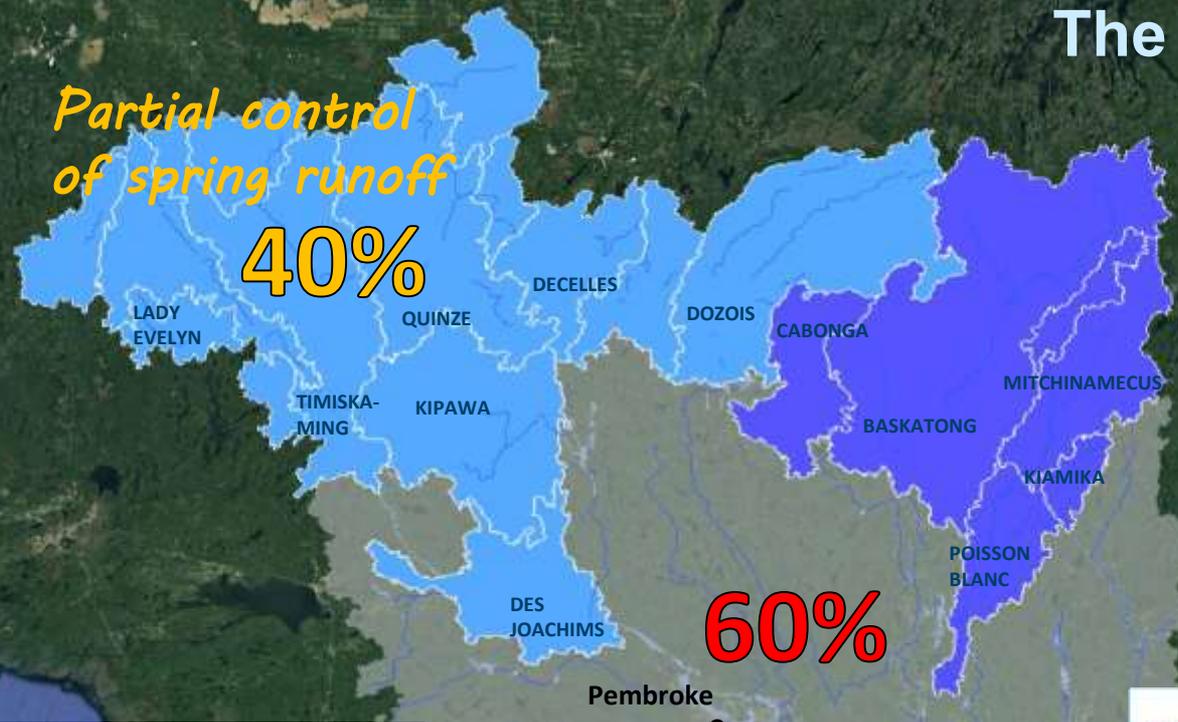
Partial control of spring runoff  
**40%**

**60%**

*No storage reservoirs to hold back spring runoff*

Basin Characteristics:

- Main reservoirs located mostly in the northern portion of the basin
- Over 60% of the basin area has no significant storage (minimal control over flows)

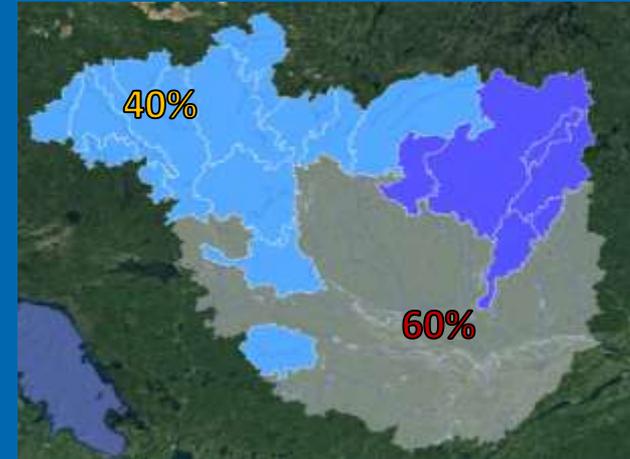




# Limits of Reservoirs Effects

## Flooding can occur when:

- Spring runoff greatly exceeds the size of reservoirs (in 40% of basin)
- There is significant spring runoff in areas where there are no reservoirs (in 60% of basin)



## Reservoirs effects:

- Flooding extent and duration are always reduced
- Flooding is eliminated in many years

Estimated Reduction in Water Levels during the 2019 Flood Event As a result of Storing Runoff in Principal Reservoirs	
Lac Coulonge (Fort-Coulonge)	120 cm
Chats Lake (Arnprior)	60 cm
Lake Deschenes (Britannia)	75 cm
Gatineau (Hull)	130 cm
Lac des Deux Montagnes	95 cm

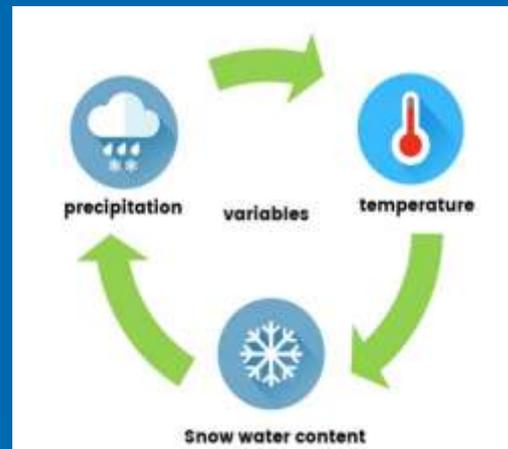


# How strong will the spring flood be?

Unfortunately, it's not possible to forecast the strength of freshet in advance.

## RISK FACTORS FOR A STRONG SPRING FLOOD :

- High amount of water contained in the snowpack when the freshet starts.
- Warm temperatures leading to rapid melt of the snowpack.
- Generally wet weather with above normal precipitation during the melt period.
- One or more rainfall event with over 25 mm in one day.
- Rainfall events hitting the central and southern portions of the basin where there are no large reservoir to hold back spring runoff.



*Temperature and precipitation factors are known only a few days in advance!*

*Refer to FAQ # 1*



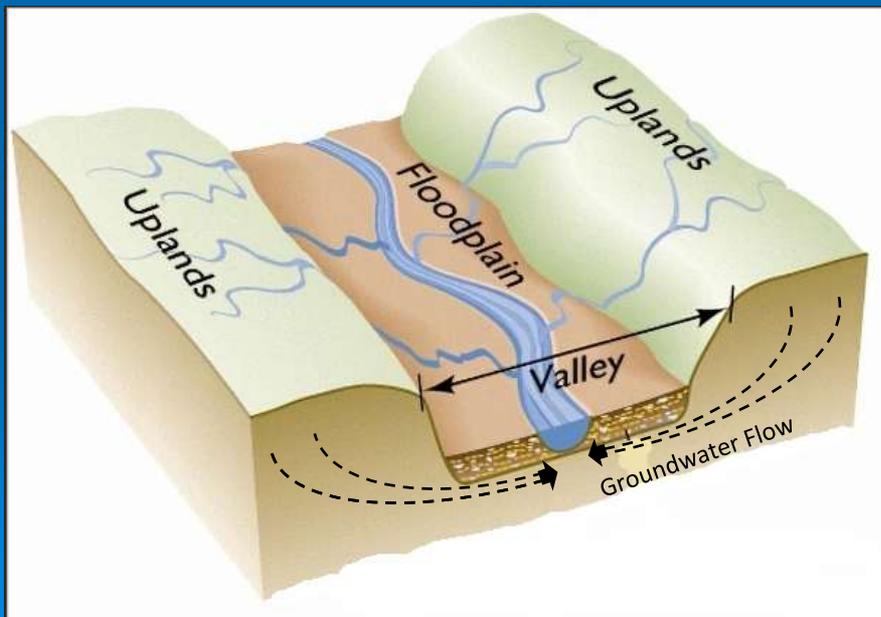
# Is flooding the new norm?

Flooding occurs naturally when the water in the river needs more space and overflows onto normally dry land, which is called the floodplain.

**Flooding is NOT expected to happen every second year.**

Flooding is driven by weather, and weather can be cyclical.

Then flooding can be cyclical too. Flood events can be clustered.



**Probabilities are used to describe how likely a flood is to occur.**

There are 5 chances in 100, or a 5% chance, of having a medium flood (e.g. a 20-year flood) during a given year.

There is a 1% chance of having a very large flood (e.g. a 100-year flood) during a given year.

*Refer to FAQ # 3*  
[www.ottawariver.ca](http://www.ottawariver.ca)



# Will climate change make flooding worse?

## What research studies say:

- Extreme rainfall events are more likely to occur.
- This makes flooding worse in smaller watersheds or areas, like in cities.
- The Ottawa River watershed is very large and flooding is more complex. Flooding along the Ottawa River typically occurs in spring, when the snow cover melts and rain is not absorbed by soils.
- Seasonal flows are expected to vary more, changing from wet to dry more rapidly and more often.



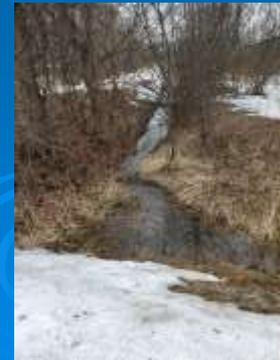
Credit: Radio Canada

## Climate change can affect flooding factors differently:

- More spring rain increases flood risk
- Variable snow cover means risk varies
- Faster snowmelt increases flood risk
- More evapotranspiration lowers flood risk

*Lots of uncertainty*

*Refer to FAQ # 14*





# Can reservoirs be increased?

It is not feasible to prevent flooding in all locations:

The size of land needed to build new or expanded reservoirs would be too large.

Studies conducted in the 1980s showed costs of new reservoirs outweigh potential benefits.

Study results still considered relevant today.



*No global solution*

Modern feasibility studies include:

- Environmental impacts, including those to aquatic environment
- Social and cultural impacts of displacing people and changing the landscape
- Lifespan of the structure and on ongoing maintenance costs
- Risk of encouraging further development in the floodplain
- Social acceptability

# **PART C**

## **DAMS IN THE BASIN**



# Types of Structures in the Basin



40% of basin area



*Reservoir Dams*

60% of basin area



*Run-Of-River Generating Station*

**Capacity to store a portion  
of the spring runoff for  
months**  
*(Dozois, Des Quinze,  
Timiskaming, etc.)*

**Limited storage - Water  
must pass through within  
hours**  
*(Chats Falls, Carillon, etc.)*



# Major Run-Of-River Dams on the Ottawa River

These facilities operate as run-of-river generating stations during most high-flow events.

Even when operators lower water levels at run-of-river dams, flooding can occur upstream because of water restricted from flowing through natural river restrictions.

Otto Holden Dam

Des Joachims Dam

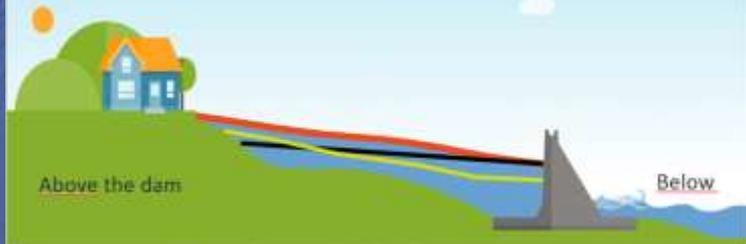
Bryson Dam

Carillon Dam

Chenaux Dam

Chats Falls Dam

***As river flow increases, run-of-river dams must lower their upstream water levels***



Above the dam

Below

- Normal operating level
- Potential flood level
- Lowered level during high flows

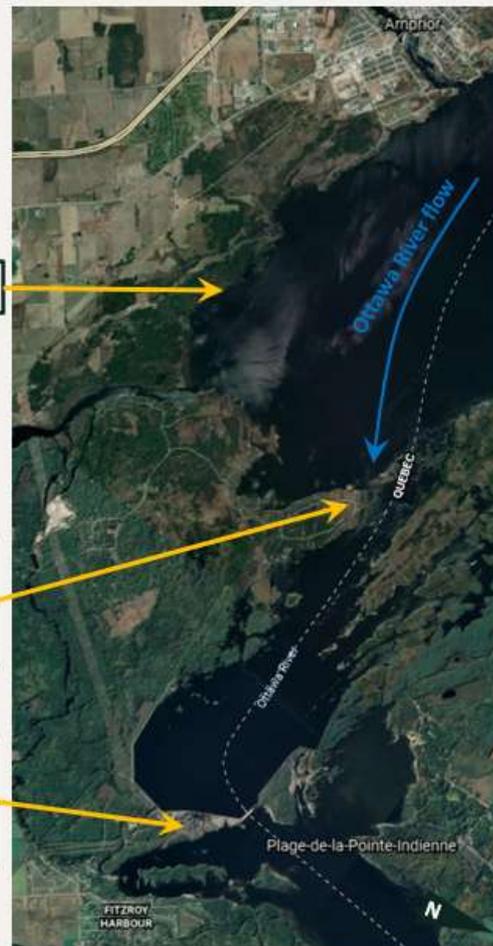
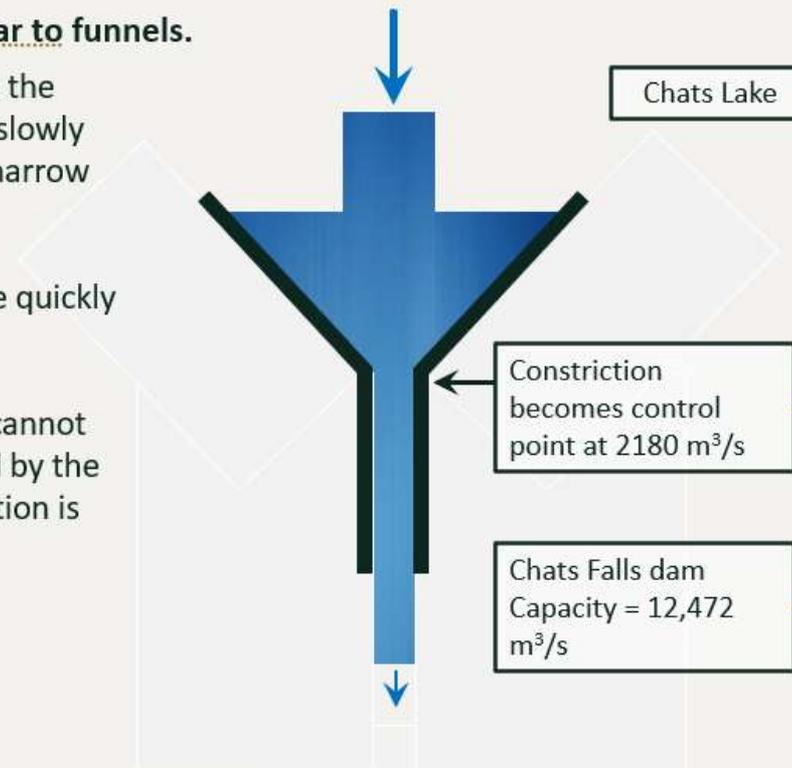


# Natural River Constrictions

## Chats Lake Example

River constrictions are similar to funnels.

- Water will not build up in the funnel if poured in more slowly than the capacity of the narrow section.
- If water is poured in more quickly it will back up.
- Conditions downstream cannot lessen the backup caused by the constriction; the constriction is the control point.





# Do downstream dams influence water levels on Lake Deschenes?

- Downstream dams have no influence on Lake Deschenes levels
- The river drops about 4 metres between the Deschenes rapids and above the ring dam and 20 metres to below parliament hill
- Downstream dams pass all arriving flow from Lake Deschenes.



No downstream dam operator can “lower the water level” on Lake Deschenes.

The only means of reducing levels on Lake Deschenes is to reduce upstream flows. This is helped by filling the principal reservoirs during freshet.



# Do downstream dams influence water levels at Pembroke?

- The presence of multiple natural constrictions in the river raises levels at Pembroke during periods of high flow.
- Downstream dams have no influence on the river levels at Pembroke.
- When flows are high, the Bryson and Rocher Fendu dams pass all arriving flow from Lake Coulonge.



No downstream dam operator can “lower the water level” at Pembroke.

The only means of reducing levels at Pembroke is to reduce upstream flows. This is helped by filling the principal reservoirs during freshet.

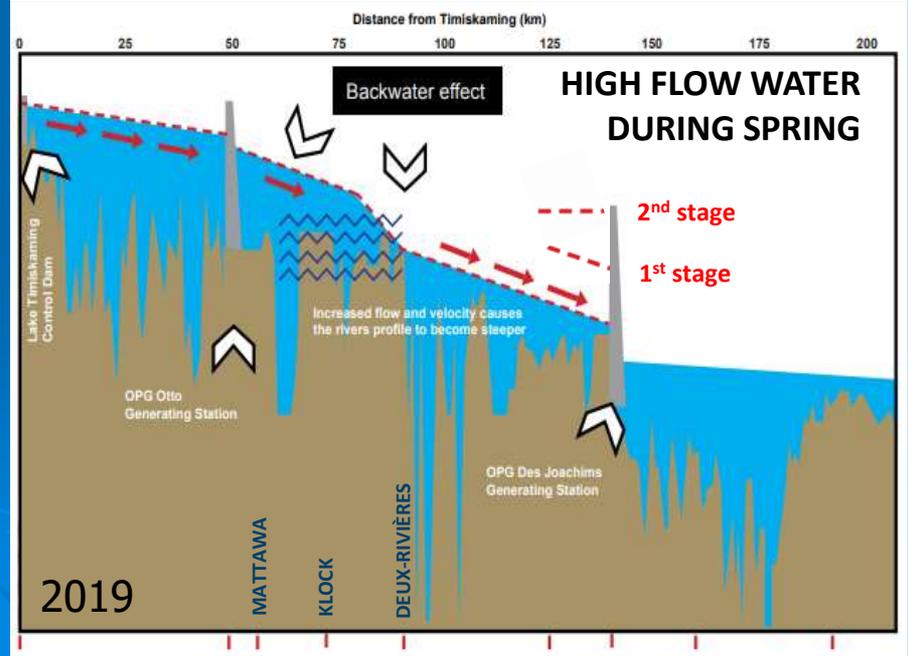
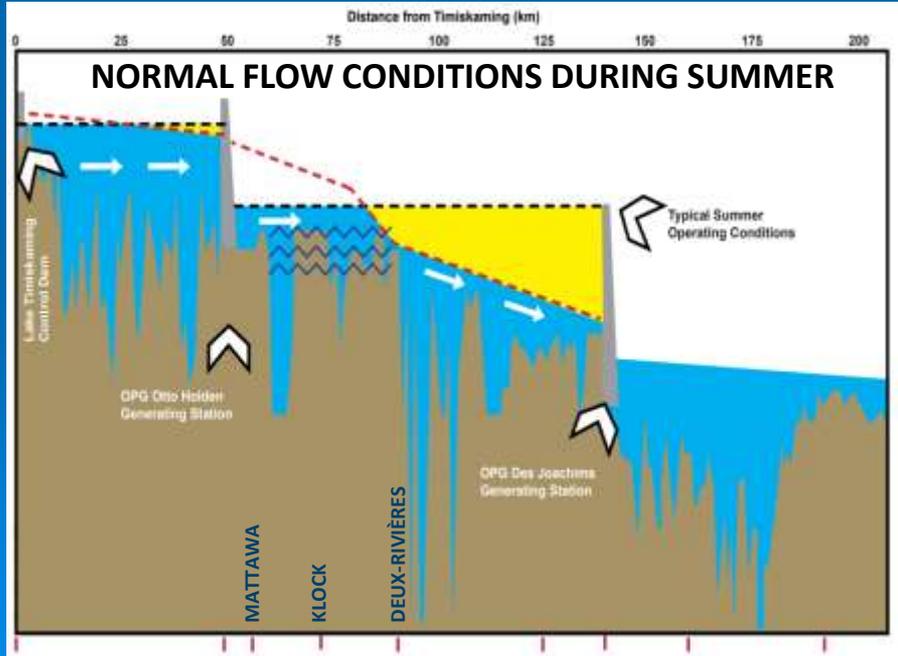
Between Pembroke and the Bryson dam, there are multiple natural constrictions (narrows, rapids, presence of islands).

# Des Joachims – Run-of-river AND Reservoir

- Des Joachims reservoirs is the last of the 7 principal reservoirs located upstream of Pembroke to be completely refilled.
- It is operated as a run-of-river facility when there is a risk that high Ottawa River flows cause flooding in Mattawa.

- The spring refill strategy consists of two stages.
- The purpose is to reduce the risk of upstream flooding and provide some relief, when possible, to flooding downstream areas.

*View a video on managing high water levels on the Ottawa River [here](#).*



**PART D**

**INFORMATION**

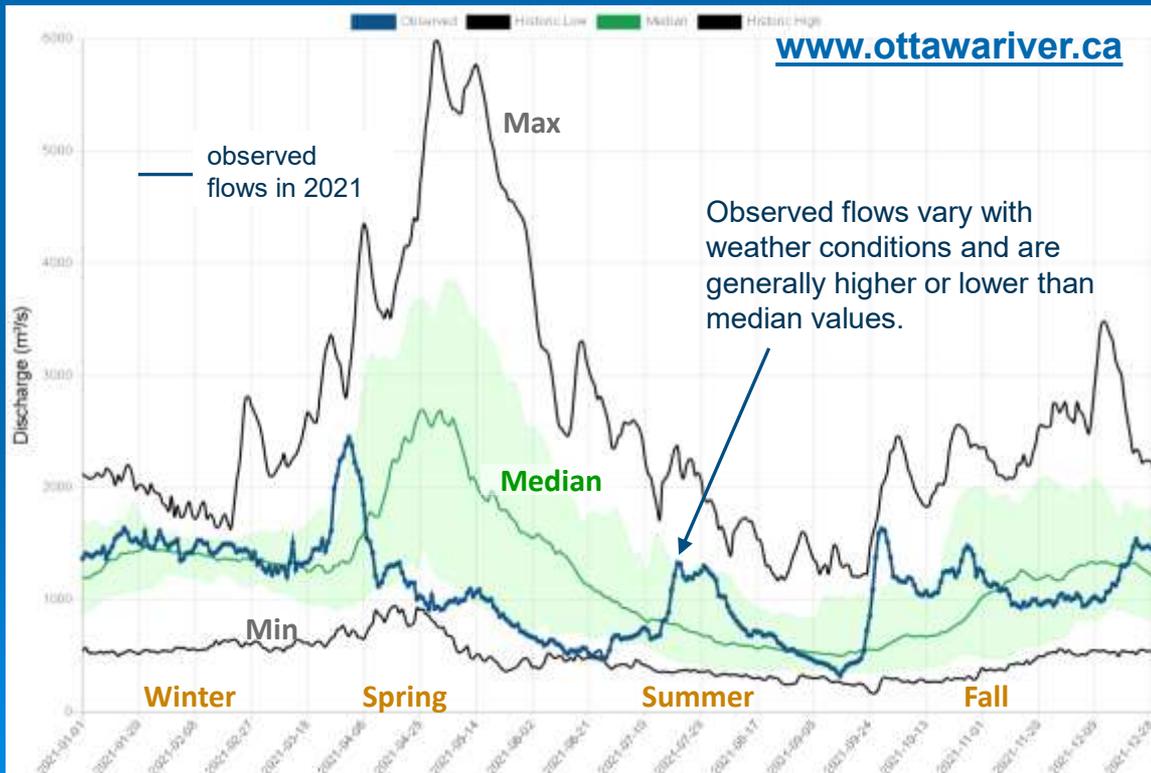
**AVAILABLE TO YOU**





# How to read graphs

Flows have been measured at the Britannia station since 1916.  
There's over 100 years of data summarized in just one figure!



- The amount of water in the river (flows or discharges) vary from year to year. Flows are higher during wet years and lower during dry years such as 2021 (shown by the blue line).
- The black lines (historical high and historical low) illustrate, for each day of the year, the maximum and minimum flows recorded since 1916.
- 80% of the time, flows are within the green band (the normal range). The conditions that are more likely to occur are illustrated by the 'median' (green line).
- Flows also vary from month to month, with spring bringing the highest flows. That's because large quantities of water are released in spring when the snow melts and rainfalls are not absorbed by the soil. This is called 'freshet'.



# Compare Snow Cover with Normal

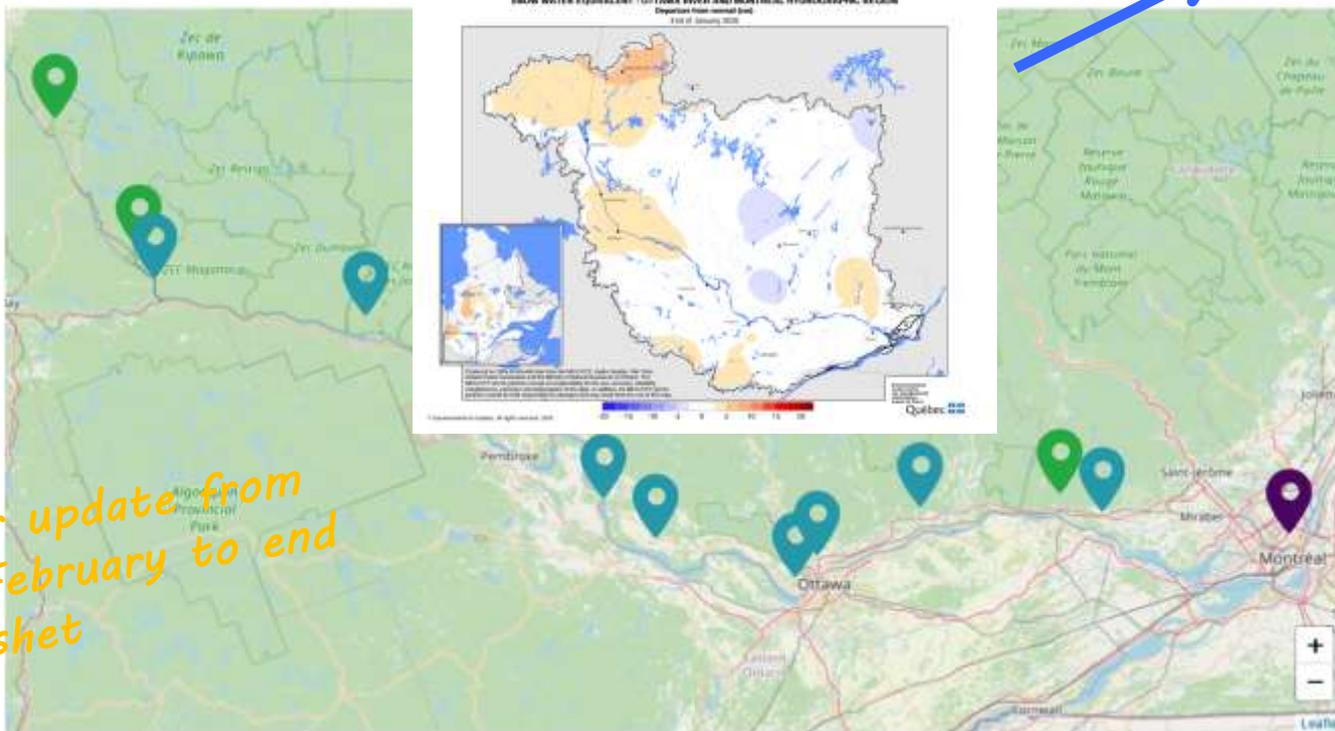
## Current Conditions

Share  

Publication: 2026-02-16

Locations to display: **River locations only** | Reservoirs only | Other locations

**SNOW MAP**



*Regular update from early February to end of freshet*

[About this map](#)



# The ORRPB Keeps the Public Informed on Basin Conditions

Ottawa River Commission de planification

Ottawa River Commission de planification

Ottawa River Regulation Planne Commission de planification de la régularisation

Ottawa River Regulation Planning Board Commission de planification de la régularisation de la rivière des Outaouais

OTTAWA assure au long Outaouais dans le Conditions

**Fall Conditions Overview in the Ottawa River Basin**

OTTAWAGATINEAU, Monday December 22, 2025 — The Ottawa River Regulating Committee provides integrated management of the principal reservoirs in the Ottawa River basin throughout the year. Effective water management requires that the Committee continually monitors river conditions and forecasts the effects of weather conditions on water levels and flows at multiple locations throughout the basin. This report is a summary of fall conditions in the Ottawa River basin.

**Total Precipitation July 1<sup>st</sup> to October 15, 2025 – Departure from normal (%)**

**Fall River Conditions:** The dry conditions and lack of rainfall throughout most of the summer and fall has led to low water conditions throughout the Ottawa River watershed. As shown in the figure above, the watershed received precipitation amounts well below normal from July 1 to October 15, 2025, that is between 30 and 60 percent less rainfall than normal depending on the location. Although wetter conditions returned in late October and November, the rainfall was not enough to bring soil moisture and runoff back to normal conditions before temperatures dropped below freezing. With these dry conditions Lac Deschênes (Britannia) and Gatineau (Hull) levels reached the 7<sup>th</sup> lowest on record in the fall period and the 13<sup>th</sup> lowest at Pembroke.

[www.orrb.ca](http://www.orrb.ca)

[www.ottawariver.ca](http://www.ottawariver.ca)

Page 1 of 3

## Information bulletins:

- Prior to spring freshet
- After spring freshet
- In summer or fall (if low flow conditions prevail)
- In late fall

*Watch our Latest News webpage*  
[www.ottawariver.ca](http://www.ottawariver.ca)  
*Follow us on X*  
[x.com/ORRPB](https://x.com/ORRPB)



# First Press Release Announces Start of Freshet

## First Press Release

- Sent to mass media & agencies
- Forecast webpage is activated

## **If Committee anticipates that river conditions on the main stem of Ottawa River may exceed flood levels:**

- Issues a second press release
- Informing to watch the daily 4-day forecasts

## **When is Forecasts webpage deactivated?**

- General trend is for a steady decrease of flow
- Flood risk is low and not expected to go up

*Watch our Latest News webpage  
[www.ottawariver.ca](http://www.ottawariver.ca)*

*Follow us on X  
[x.com/ORRPB](https://x.com/ORRPB)*

Ottawa River Regulation Planning Board Commission de planification de la régularisation de la rivière des Outaouais Press Release

### RISING OTTAWA RIVER WATER LEVELS

OTTAWA/GATINEAU, Wednesday March 19, 2025 — The Ottawa River Regulating Committee would like to inform watershed residents that levels and flows along the Ottawa River have begun increasing due to spring runoff. It cautions residents along the shores of the Ottawa River **from Mattawa down to the Montreal Region** that throughout the spring freshet period, which can span several weeks, water levels can rise rapidly at times and cause minor flooding in low-lying areas. Spring freshet is starting early this year due to recent warm temperatures combined with rain that initiated the melting of snow across the Ottawa River basin. At this time, weather forecasts call for the return of closer to normal temperatures and a moderate melt of the remaining snow cover. It is too early to predict the magnitude and timing of the peak in the main stem of the Ottawa River. The Regulating Committee will be closely monitoring the effects of precipitation and temperature increases throughout the entire freshet period as they may cause levels and flows to change.

### Forecasts

Publication: 2025-05-22 3:30 PM

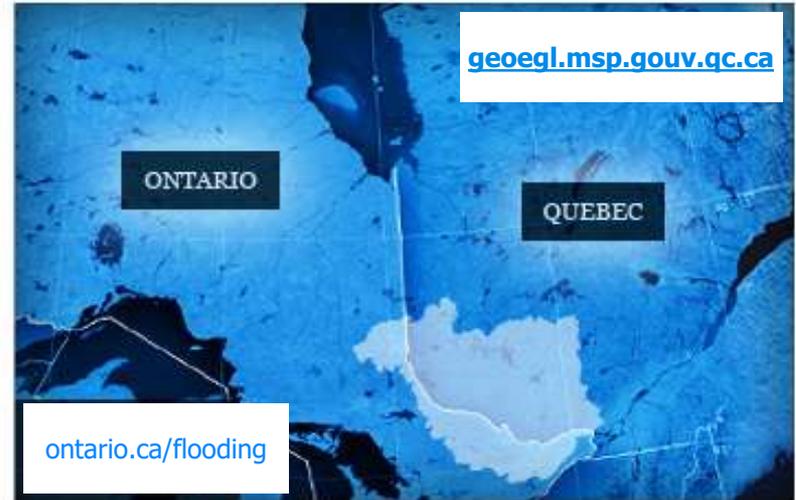


# Flood Risk is Communicated to Responsible Provincial Authorities

## In Ontario:

Conservation Authorities and MNR District Offices are informed of forecasted Ottawa River conditions through MNR\* associate membership on the Committee.

They issue flood related messages and information to those that may be at risk, and those that respond to flood events.



## In Québec :

The Ministère de la Sécurité publique through the *Centre des opérations gouvernementales* and the Regional Directorates of the *Sécurité civile* collaborate with municipalities to protect residents. They are informed of relevant hydrological forecasts by member agencies of the Committee.

\* The Surface Water Monitoring Centre of the Ministry Natural Resources is an associate member of the Ottawa River Regulating Committee



# Municipalities Respond to Flood Events

---

## Roles and responsibilities of municipalities in emergency response include:

- Determining appropriate response to a flood threat and if necessary, deploy municipal services.
- If required, implementing their Emergency Response Plan.
- Maintaining liaison with flood coordinators at the provincial level:
  - In Ontario - liaison with conservation authorities or MNR District Offices
  - In Quebec - liaison with *Sécurité civile* and *Centre des opérations gouvernementales*

## For complete information on roles and responsibilities:

- In Ontario: refer to the Emergency Management and Civil Protection Act ([Emergency management | ontario.ca](https://www.ontario.ca/emergency-management))
- In Quebec: refer to the [Plan national de sécurité civile | Gouvernement du Québec \(quebec.ca\)](https://www.gouvernement.qc.ca/plan-national-de-securite-civile)



# Closing Remarks

- The Ottawa River is only partially controlled. In spring, the river is largely at the mercy of natural snowmelt and rainfall events. Flooding has occurred in the past and will occur again. Droughts can also occur.
- The Committee monitors river conditions all year long and optimizes the use of principal reservoirs to reduce impacts of extreme events in the Ottawa River, its major tributaries and the Montreal region.
- If your home is located in the river floodplain, know how to stay informed and be ready for all river conditions.
- The governments of Canada, Ontario, and Quebec collaborate with Ontario Power Generation and Hydro-Québec to support the work of the Ottawa River Regulation Planning Board including the Committee and Secretariat.



# Information

Current and  
forecast  
conditions  
during freshet

[www.ottawariver.ca](http://www.ottawariver.ca)  
[www.rivieredesoutaouais.ca](http://www.rivieredesoutaouais.ca)  
**1-888-621-0059**

*Conditions  
actuelles et  
prévues en  
rivière pendant  
la crue*

@ORRPB



@CPPRO

Ottawa River  
Regulation Secretariat  
Email : [secretariat@ottawariver.ca](mailto:secretariat@ottawariver.ca)

**819-303-5886** Ottawa-Gatineau  
**1-888-621-0059** Outside

*Secrétariat pour la régularisation  
de la rivière des Outaouais  
Email : [bureau@ottawariver.ca](mailto:bureau@ottawariver.ca)*

***819-303-5886** Ottawa-Gatineau  
**1-888-621-0059** À l'extérieur*

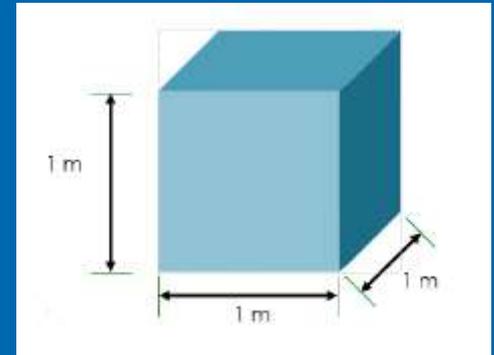
**ANNEX**



# River Characteristics

## ➤ What is flow?

- How much water is coming into the river reach from the upstream part of the basin / out of the river reach towards the downstream area
- Measured in cubic metres per second ( $\text{m}^3/\text{s}$ )
- Flow --→ same as “Discharge”



## ➤ What is level?

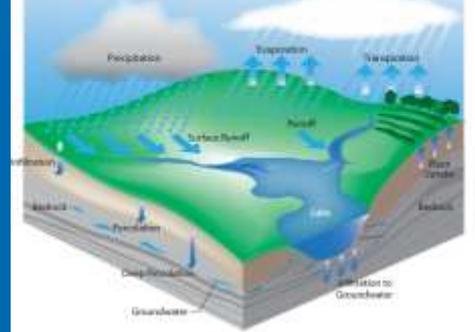
- Level is the elevation of the water surface
- Measured in metres (m) above sea level
- Measured at strategic locations and dams

➤ *Natural rivers – the higher the flow, the higher the level*

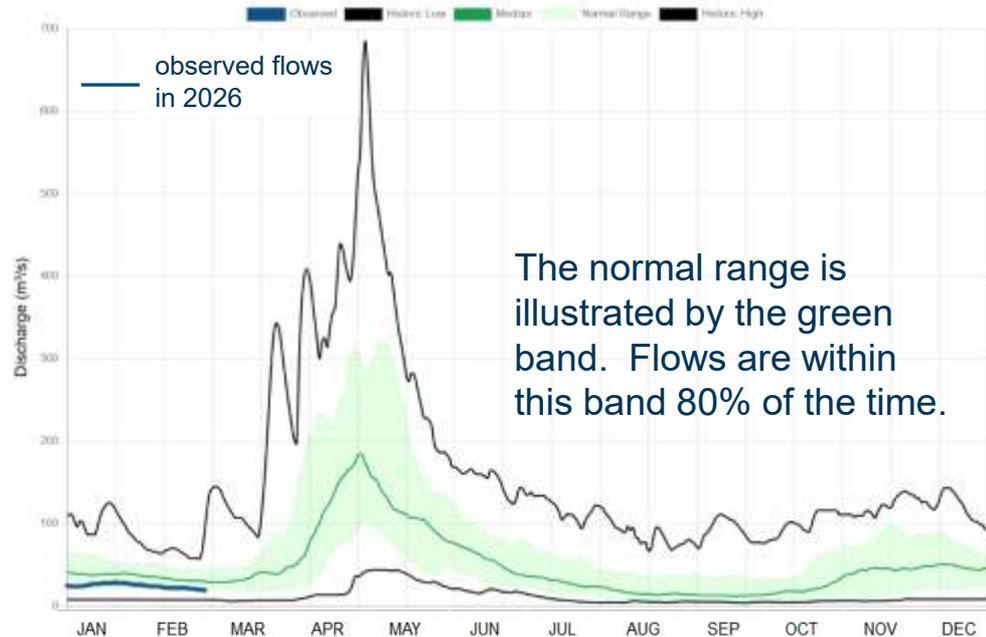
- Upstream – means upriver, against the water flow and towards the original source.
- Downstream – is the direction with the flow of water

# Variability of Flows in Natural Rivers - Not all Seasons are Equal

## The water cycle



Petawawa River – Flow Normal Range (cubic metres per second)



- In winter, precipitation is stored in the snowpack. Groundwater feeds streams and rivers.
- In spring, large quantities of water are released when the snow melts. This is called 'freshet'.
- In summer, most water from rainfall is taken up by vegetation.
- In fall, the soil becomes easily saturated when it rains and rain-water runs off to low-lying areas and streams.



# In natural rivers, levels vary with flows

- In natural streams, levels go up when flows go up
- This is due to natural restrictions in river (such as rapids) that act as funnels.
  - If one pours water too quickly in a funnel, water will build up in the funnel (and will even spill up).
  - Similarly, if the river flow increases through a restriction, the water level in the river upstream of the restriction will rise.
- This is also observed in the Ottawa River (ex. near Pembroke, in Lake Deschenes)

