



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 Reservoir Effects

- Types of reservoir dams
- Still partially a natural river

## Part C: Information available to you

- ORRPB website
- Stay informed

# **PART A**

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

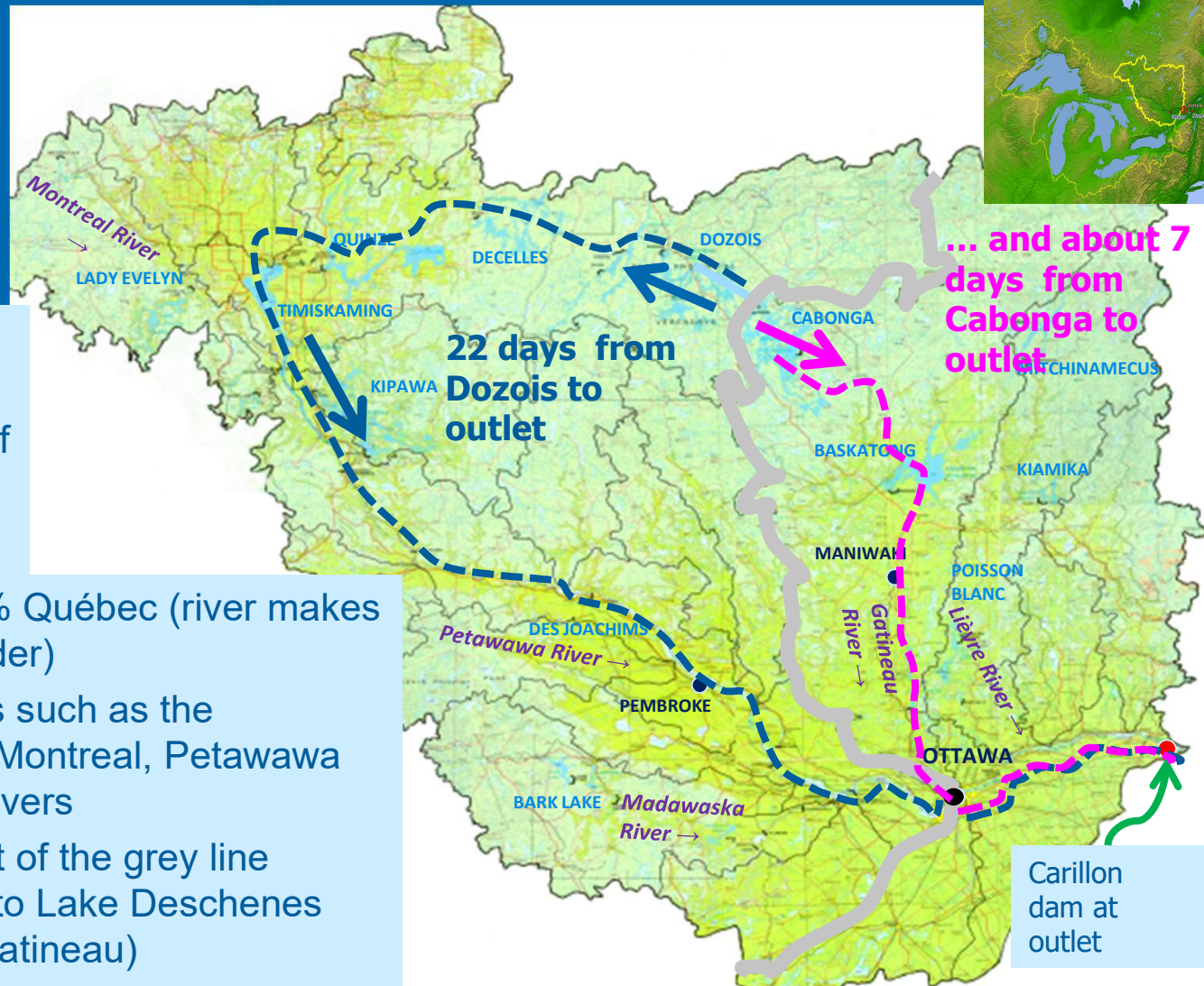




# Ottawa River Watershed

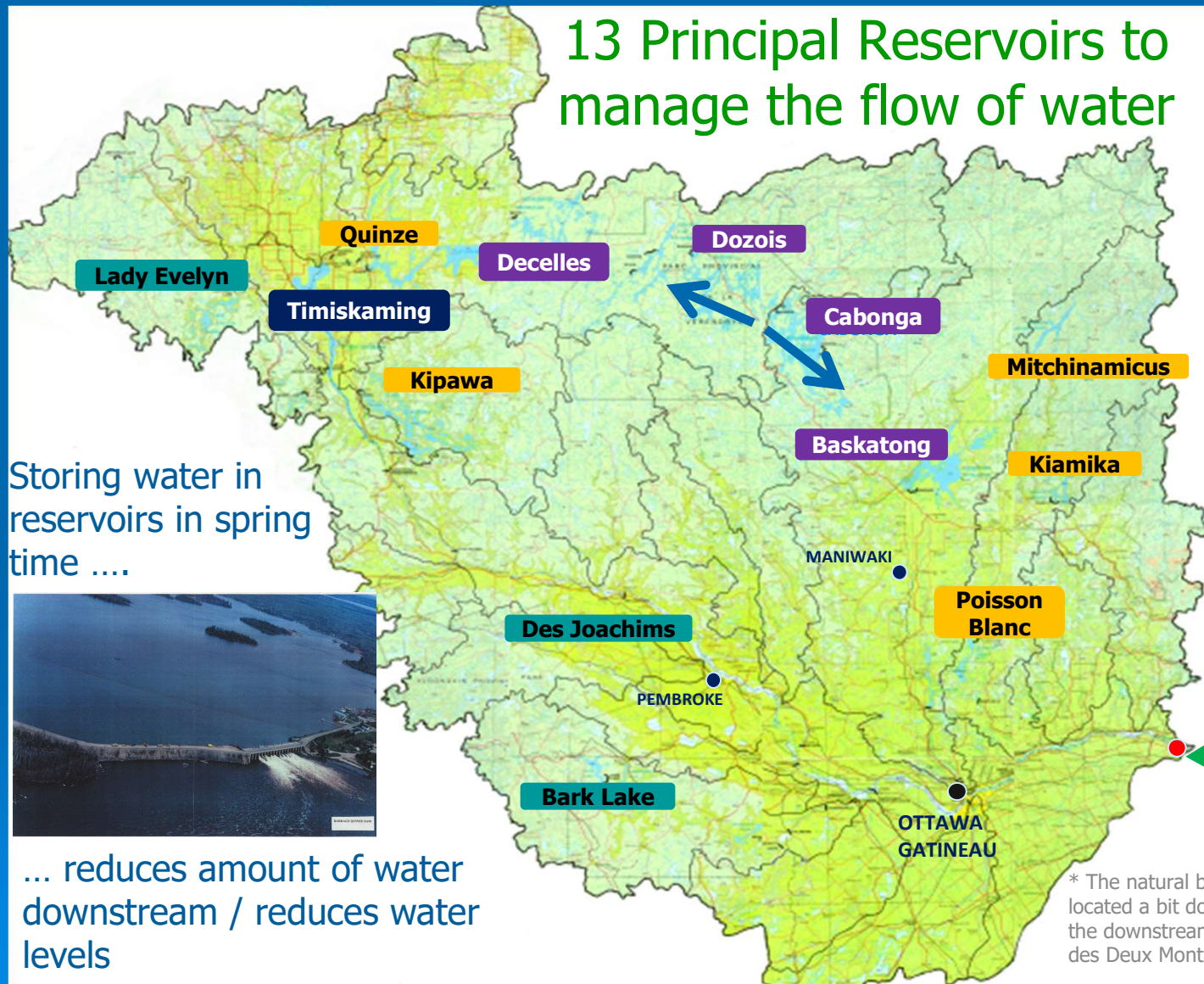


- Larger than England
- Largest tributary of the St. Lawrence River
- 35% Ontario / 65% Québec (river makes up majority of border)
- Over 15 tributaries such as the Gatineau, Lièvre, Montreal, Petawawa and Madawaska rivers
- Only the land west of the grey line contributes water to Lake Deschenes (west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





## 13 Principal Reservoirs to manage the flow of water



ONTARIOPOWER  
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\*

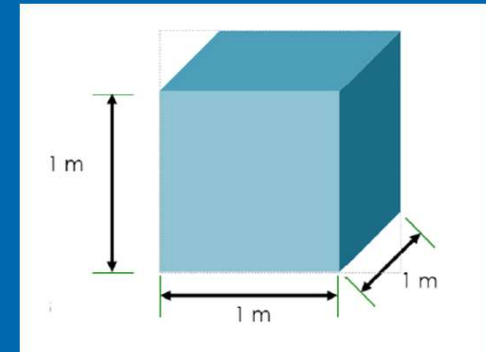
\* The natural basin outlet is  
located a bit downstream at  
the downstream end of Lac  
des Deux Montagnes





# 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  $\rightarrow$  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 – levels vary with flows*

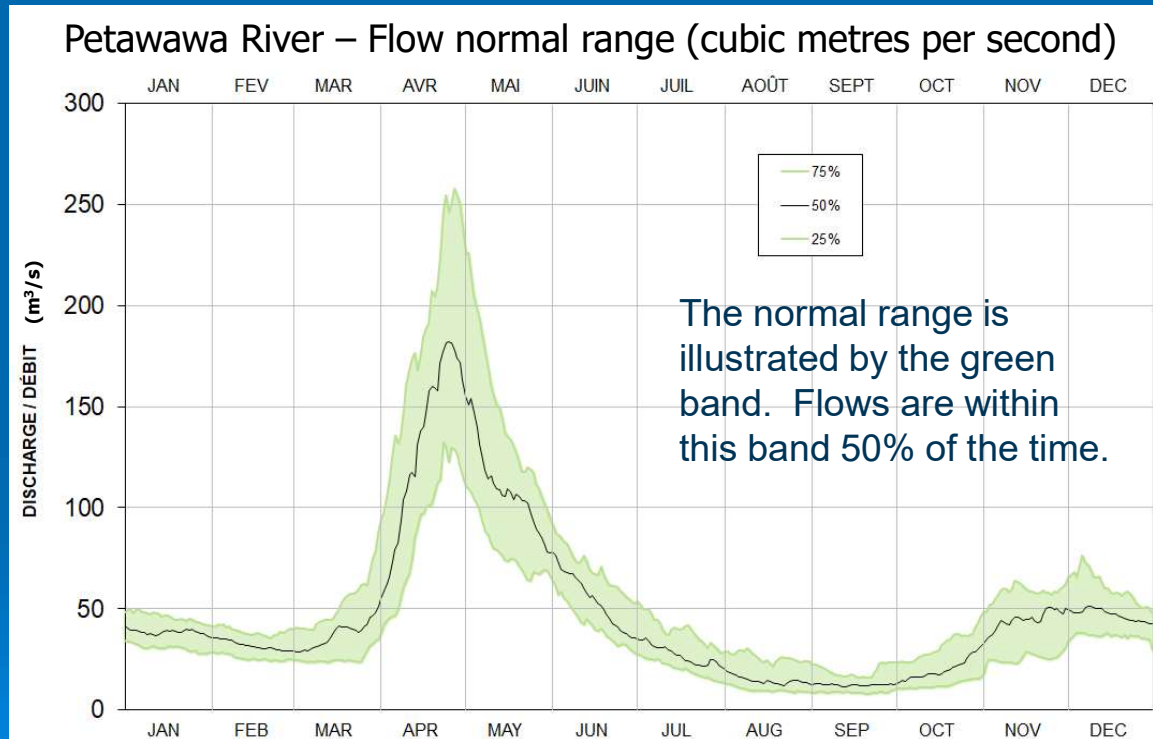


*Upstream – coming from a river section located higher up*  
*Downstream – towards the direction of the water*

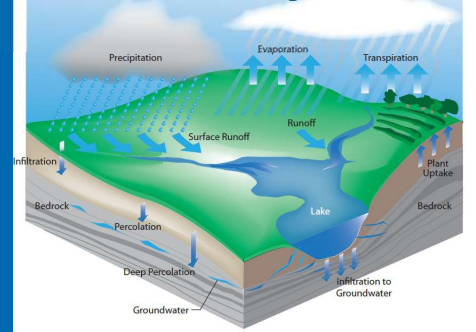


# Variability of Flows in Natural Rivers

## - Not all Seasons are Equal



### The water cycle

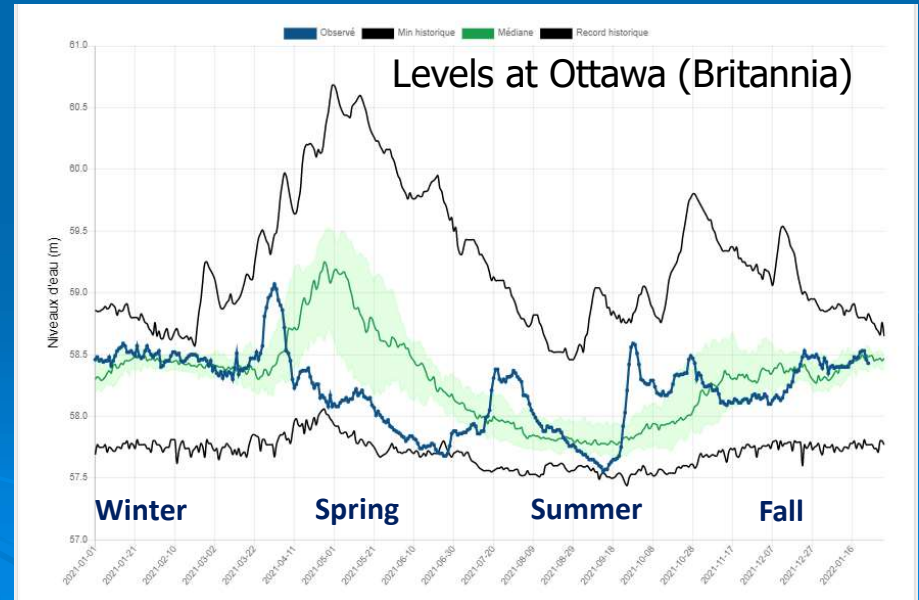
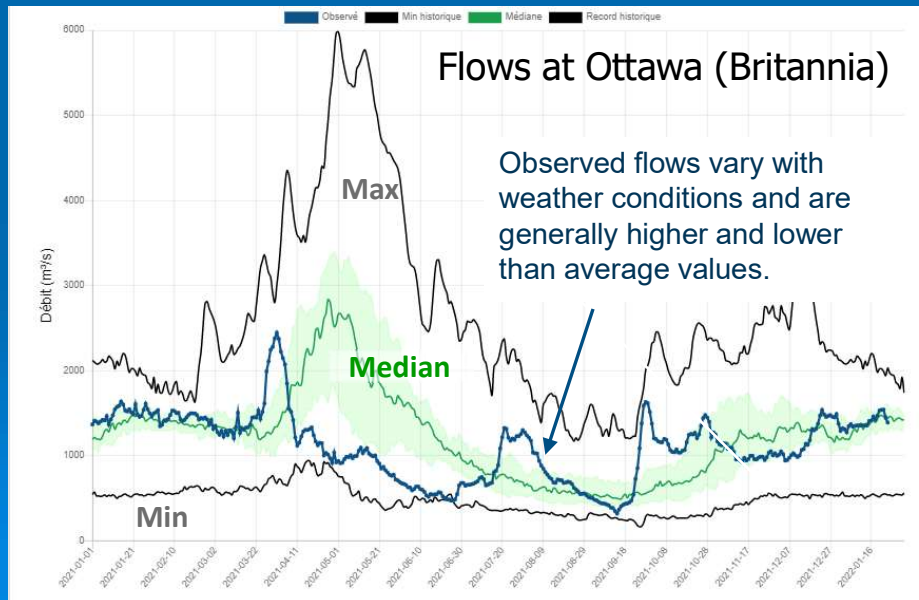


- In winter, precipitation is stored in the snowpack. Groundwater feeds streams and rivers.
- In spring, large quantities of water are released when the snow melts. This is called 'freshet'.
- In summer, most water from rainfall is taken up by vegetation.
- In fall, the soil becomes easily saturated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



# Ottawa River Characteristics

- Levels change in response to flows along the Ottawa River
- Large reservoirs are used to partially control the flow of the Ottawa River
- This partial control alters the natural flow pattern of the Ottawa River by:
  - Augmenting flows in winter
  - Reducing flows (and flooding) during the spring freshet







# 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

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



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



# 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.
- 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.

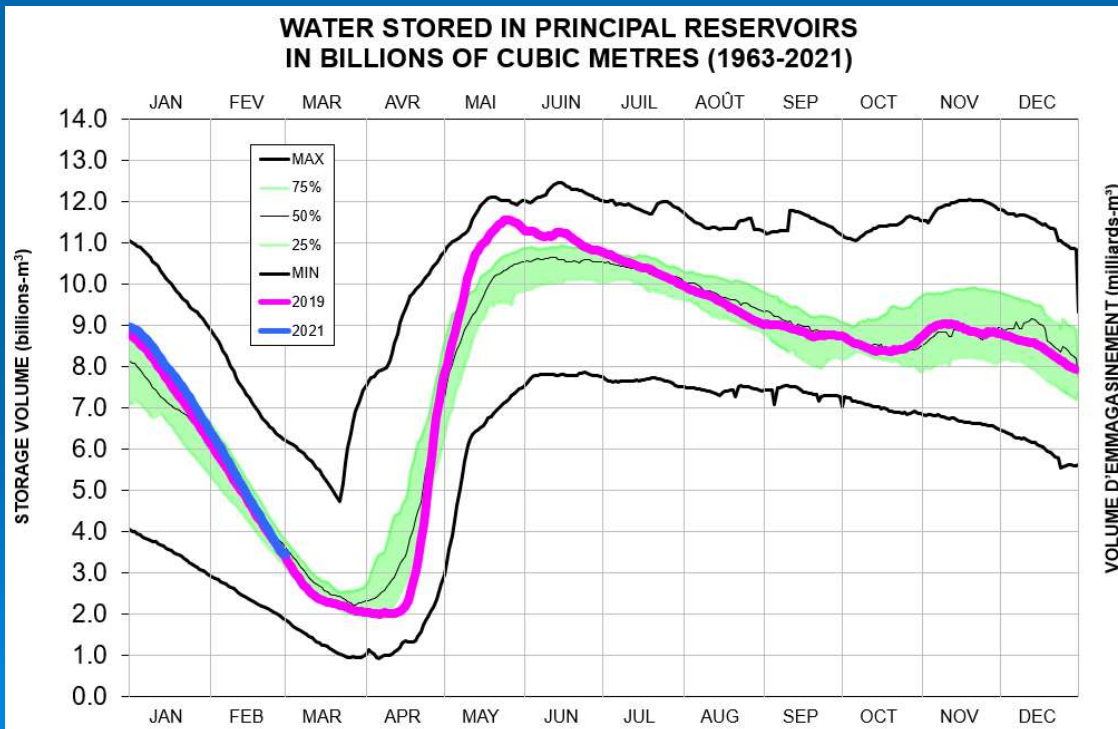
Operators work together to manage their principal reservoirs.

- 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 can occur 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 basin / river conditions
- Gradual drawdown of the principal reservoirs ( December to end of March)
- Optimize reservoir refill timing to reduce flooding impacts (during spring)



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



## **PART B**

# **LIMITS TO RESERVOIR EFFECTS**



*Partial control  
of spring runoff*  
**40%**

The Ottawa River  
behaves mostly  
like a natural  
river

**60%**

*No storage  
reservoirs to  
hold back  
spring runoff*

• **Outlet\* at  
Carillon  
dam**

#### 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)

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

Google Earth





# Types of Structures in the Basin

40% of basin area



*Reservoir Dams*

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

60% of basin area



*Run-Of-River Generating Station*

**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

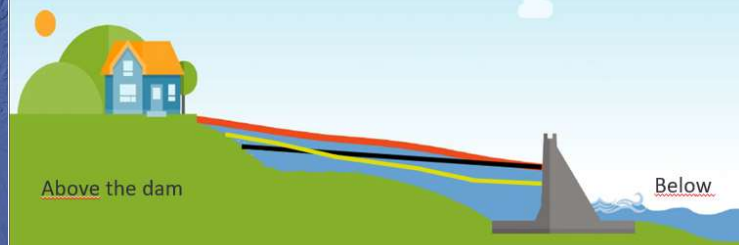
Bryson Dam

Chenau Dam

Chats Falls Dam

Carillon Dam

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



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

Image NOAA

Image Landsat / Copernicus

Google Earth



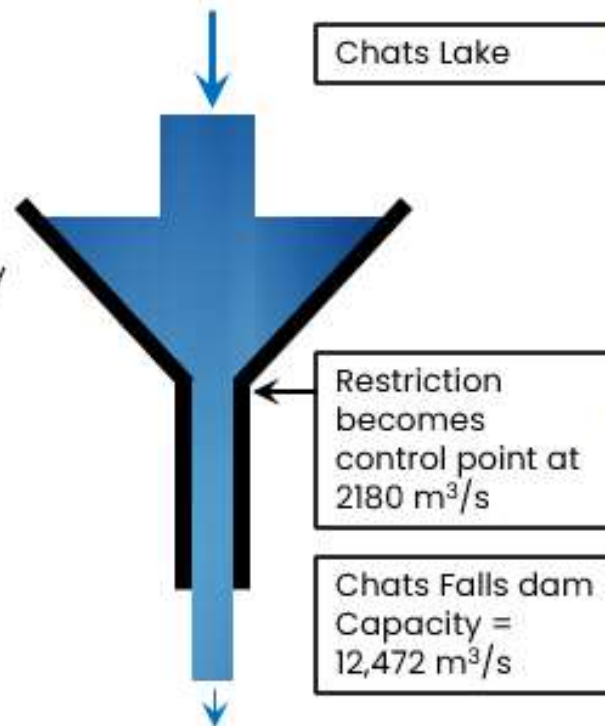


# Natural river restrictions

## Chats Lake Example

### River restrictions 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 restriction, the restriction is the control point



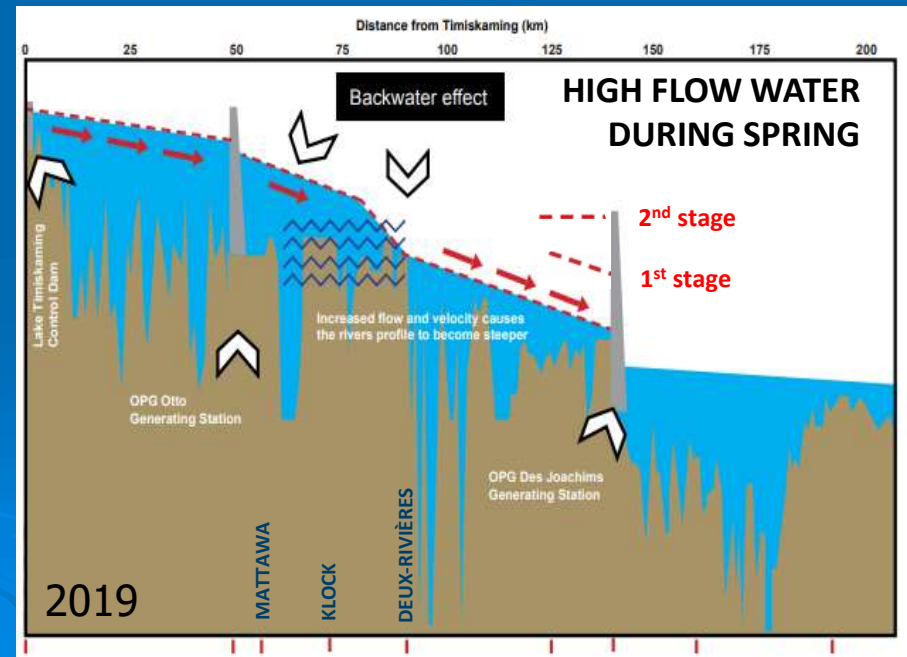
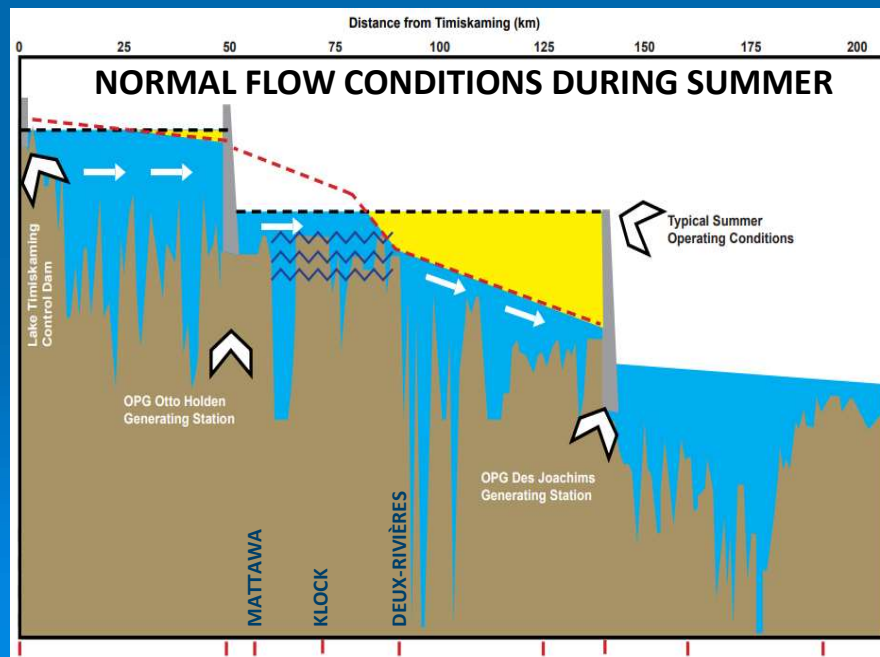


# Des Joachims – Run-of-river AND Reservoir

- Des Joachims reservoir 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](#).*

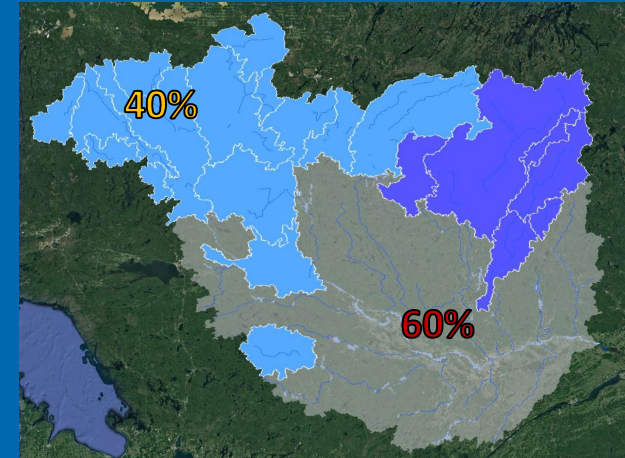




# Limits of Reservoirs Effects

## Flooding can occur when:

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



## Reservoirs effects:

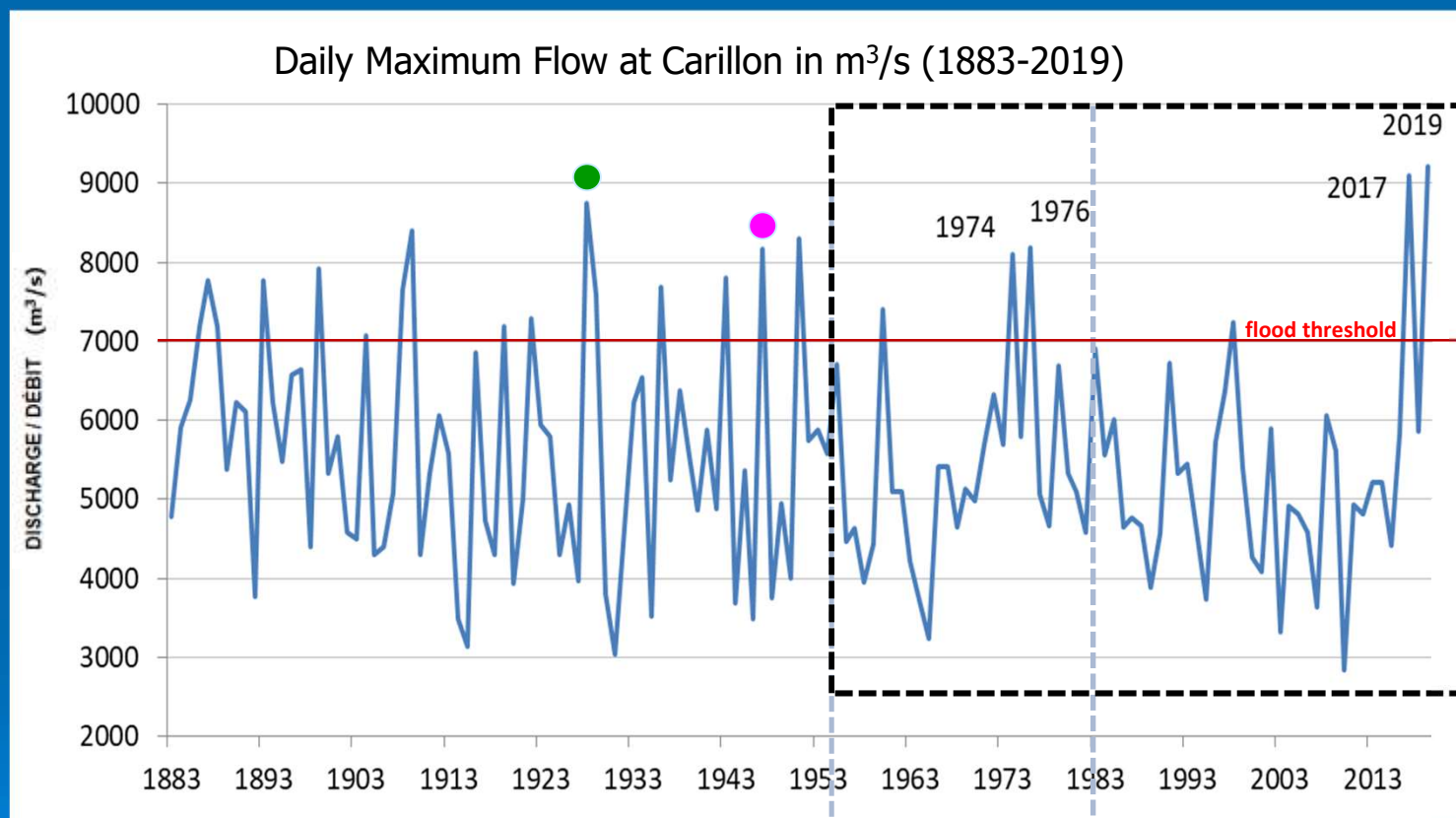
- Flooding extent and duration are always reduced
- Flooding is eliminated in many years

### Estimated Reduction in Water Levels during the 2019 Flood Event As a result of Storing Runoff in Principal Reservoirs

Lake Deschenes (Britannia)	75 cm
Gatineau (Hull)	130 cm
Lac des Deux Montagnes	95 cm



# Historic Floods of the Ottawa River



1954 – Filling of the last reservoir

1983 – ORRPB Creation

*Just like all other rivers,  
flooding can occur on  
the Ottawa River*

**Flooding in Hull in 1947**



**Flooding in Ottawa in 1928**





**PART C**

**INFORMATION**

**AVAILABLE TO YOU**



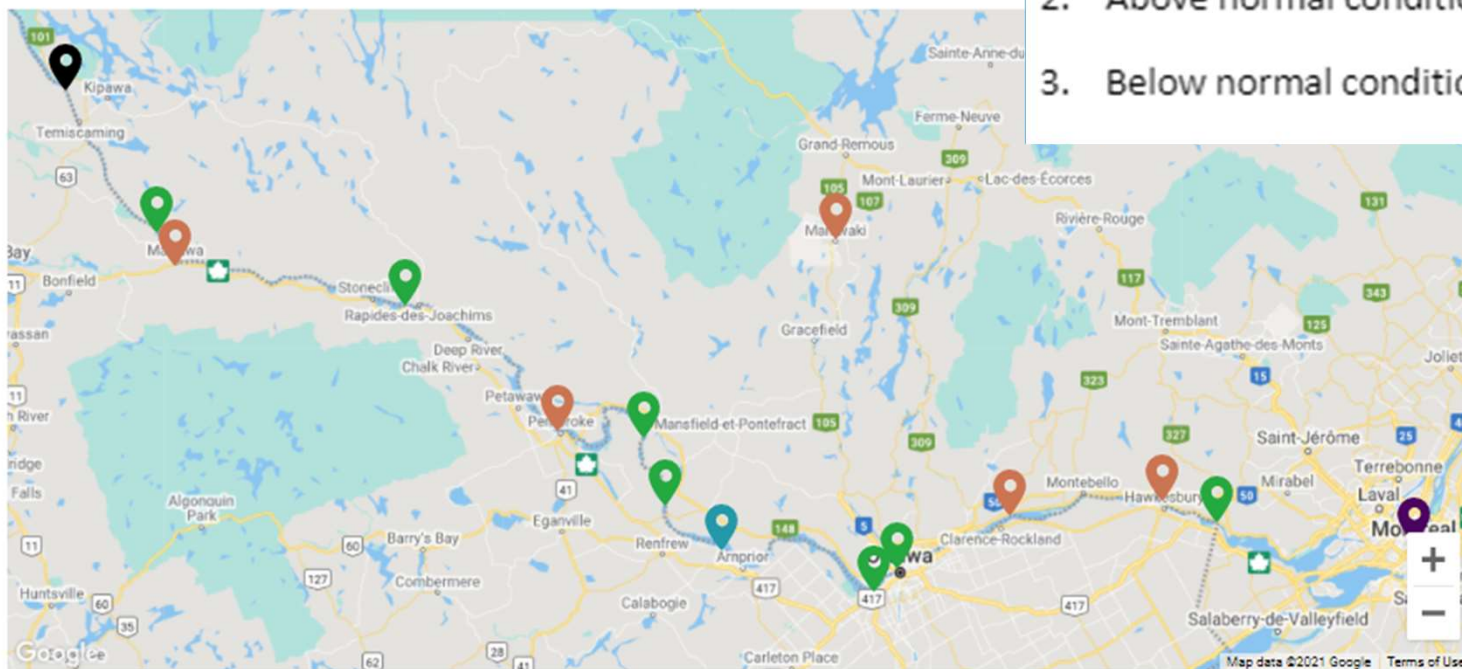
# ORRPB Website

*Above normal does not mean that flooding is occurring*

## Current Conditions

Publication: 2021-02-06

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



1. Normal conditions
2. Above normal conditions
3. Below normal conditions



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

[About this map](#)

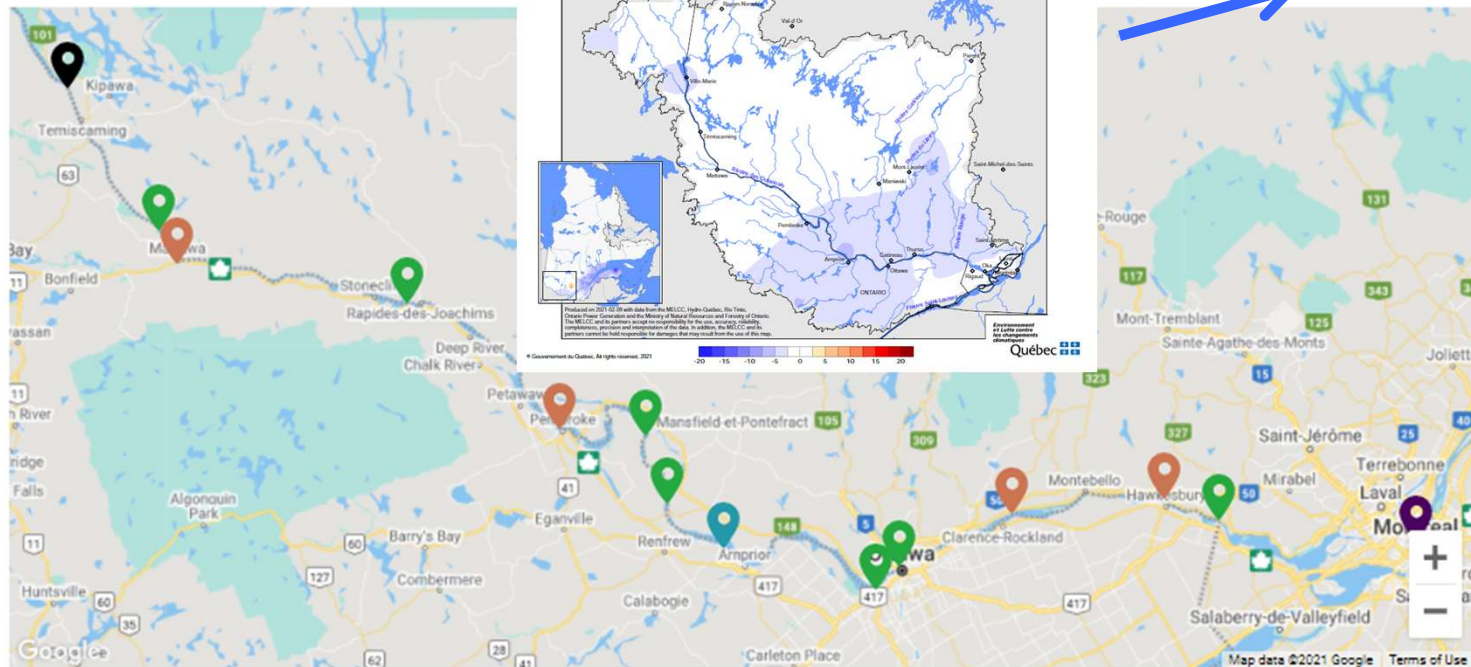


# Compare Snow Cover with Normal

## Current Conditions

Publication: 2021-02-06

Locations to display: [River locations only](#) | [Reservoirs](#)



Regular update from  
early February to end  
of freshet

Snow map

[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 Plan Commission de planification de la régularisation

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

**Aperçu des conditions automnales dans le bassin de la rivière des Outaouais**

**OTTAWA/GATINEAU, vendredi 17 décembre 2021** — Le Comité de régularisation de la rivière des Outaouais assure la gestion intégrée des principaux réservoirs du bassin versant de la rivière des Outaouais tout au long de l'année, notamment pendant la période automnale lorsque les conditions en rivière sont sensibles aux systèmes météorologiques et peuvent changer rapidement. Le présent bulletin est un résumé des conditions automnales dans le bassin de la rivière des Outaouais.

**Conditions en rivière :** Cette année, les niveaux d'eau de la rivière des Outaouais ont été près de la normale pendant une bonne partie de l'automne. Après un été relativement sec, les débits en rivière étaient nettement sous les normales au cours des trois premières semaines de septembre. Cependant, les précipitations de septembre ont été supérieures aux normales en raison d'un important système qui a laissé jusqu'à 125 mm de pluie en 3 jours seulement à la fin septembre. Les précipitations au cours des mois d'octobre et novembre ont été plus modérées, voire sous les normales en novembre, tant pour le nord que le sud. Pour l'ensemble de l'automne, le portrait est donc partagé, l'anomalie de précipitations étant positive pour une large portion du bassin mais déficitaire pour les bassins du nord comme montré dans la figure ci-dessous.

ANOMALIES DE PRÉCIPITATION DE SEPTEMBRE, OCTOBRE ET NOVEMBRE 2021  
PAR RAPPORT À LA MOYENNE HISTORIQUE DE 1981 À 2010 (%)

## Information bulletins:

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

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

Follow us on Twitter

[twitter.com/ORRPB](https://twitter.com/ORRPB)





# First Press Release Announces Start of Freshet

## First Press Release

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

## **If risk of flooding is increasing**

- New press release
- Red banner appears on website

*Watch our 'Latest News' webpage*

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

*Follow us on Twitter*

*[twitter.com/ORRPB](https://twitter.com/ORRPB)*



Ottawa River  
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Commission de planification  
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de la rivière des Outaouais

### RIISING OTTAWA RIVER WATER LEVELS

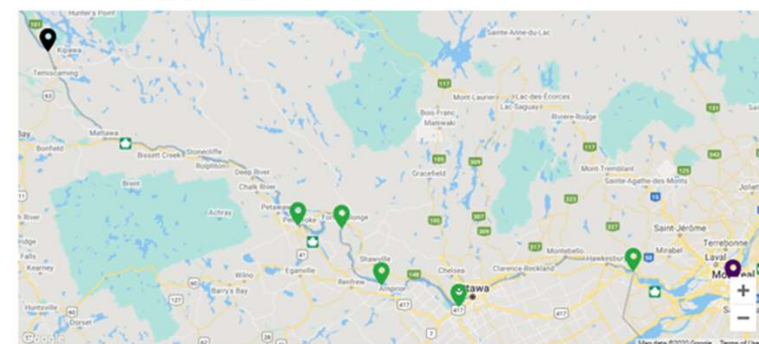
**OTTAWA/GATINEAU, Sunday, March 29, 2020** — The Ottawa River Regulating Committee would like to inform watershed residents that levels and flows along the Ottawa River have begun increasing with the onset of the spring freshet period. It cautions residents along the shores of the Ottawa River from Mattawa down to the Montreal region that during the spring period water levels can rise rapidly and cause minor flooding in low-lying areas. Based on the current snow cover and the weather forecast, the Regulating Committee anticipates that the levels and flows on the main stem of the Ottawa River will remain within the normal range of fluctuations associated with the spring freshet period.

## Forecasts

Publication: 2020-05-08 1:54 PM

[Share](#) [Tweet](#)

This map includes markers representing the locations where the Ottawa River Regulating Committee provides hydrological forecasts to the public.





# Flood Risk is Communicated to Responsible Provincial Authorities

## In Ontario:

Conservation Authorities and NDMNRF District Offices are informed of forecasted Ottawa River conditions through NDMNRF\* 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 the Secretariat and member agencies of the Committee.

\* The Surface Water Monitoring Centre of the Ministry of Northern Development, Mines, Natural Resources and Forestry 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 to assist affected residents.
- If required, implementing their Emergency Response Plan.
- Maintaining liaison with flood coordinators at the provincial level:
  - In Ontario - liaison with conservation authorities and/or NDMNRF 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/government/emergency-management))
- In Quebec: refer to the [Plan national de sécurité civile | Gouvernement du Québec \(quebec.ca\)](https://www.quebec.ca/government/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)

*Conditions  
actuelles et  
prévues en  
rivière pendant  
la crue*

@ORRPB

TWITTER

@CPPRO

Recorded message with current and forecast river conditions – Toll free number

**1 -888-621-0059**

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

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