Myths and Realities About Climate Change

Congrès nord-américain de la canneberge – March 30th, 2026

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What is Agriclimat?

Led by the ***Conseil pour le développement de l'agriculture du Québec*** (CDAQ) since 2017, the project aims to equip farmers with the tools to effectively combat climate change.

Agriclimat bénéficie d'une aide financière du gouvernement du Québec provenant du programme Action-Climat Québec et rejoint les objectifs du Plan pour une économie verte 2030

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Expected Climate Changes

Statement 1 : The winter season

«With climate change, winters will be milder and less snowy.»

True or false?

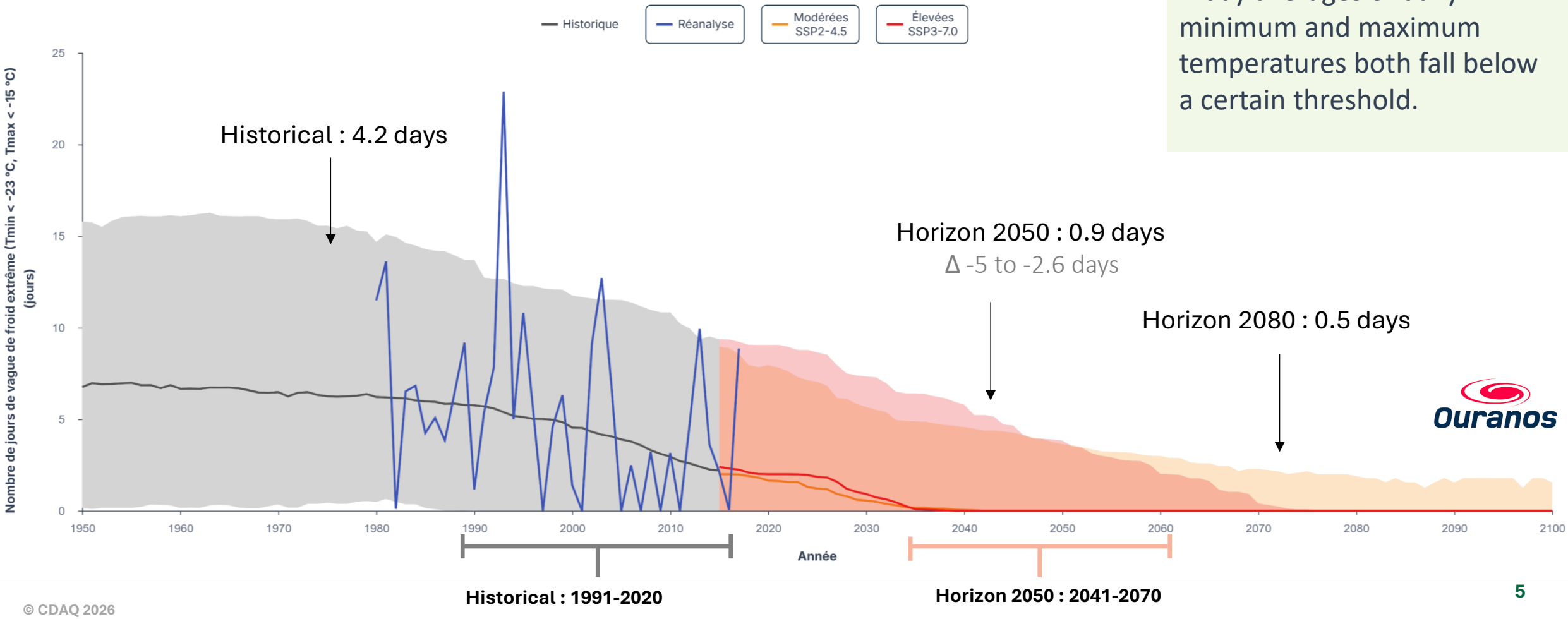
Extreme cold waves

Centre-du-Québec

Based on climate modeling

Number of extreme cold waves (Tmin < -23 °C, Tmax < -15 °C) - Annual

Projected climate time series through 2100



A cold wave occurs when the 2-day averages of daily minimum and maximum temperatures both fall below a certain threshold.

Change in the number of freeze–thaw cycles: Centre-du-Québec

A freeze–thaw cycle corresponds to a day when Tmax > 0 °C and Tmin < 0 °C.

	Annual	**Winter :** December-January-February
1991-2020	81 days	24 days
2041-2070	69 days	28 days
Δ	**- 12 days** (- 18 to - 6 days)	**+ 4 days** (- 3 to + 9 days)

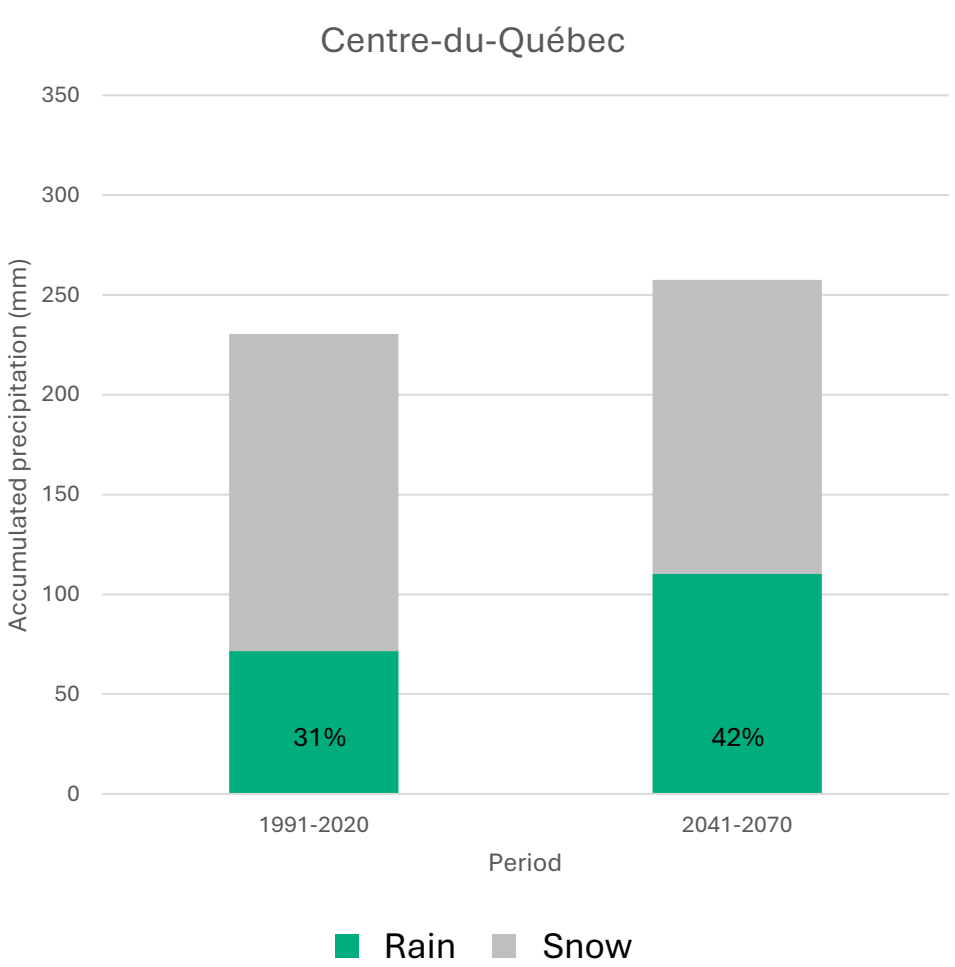
OURANOS 2023

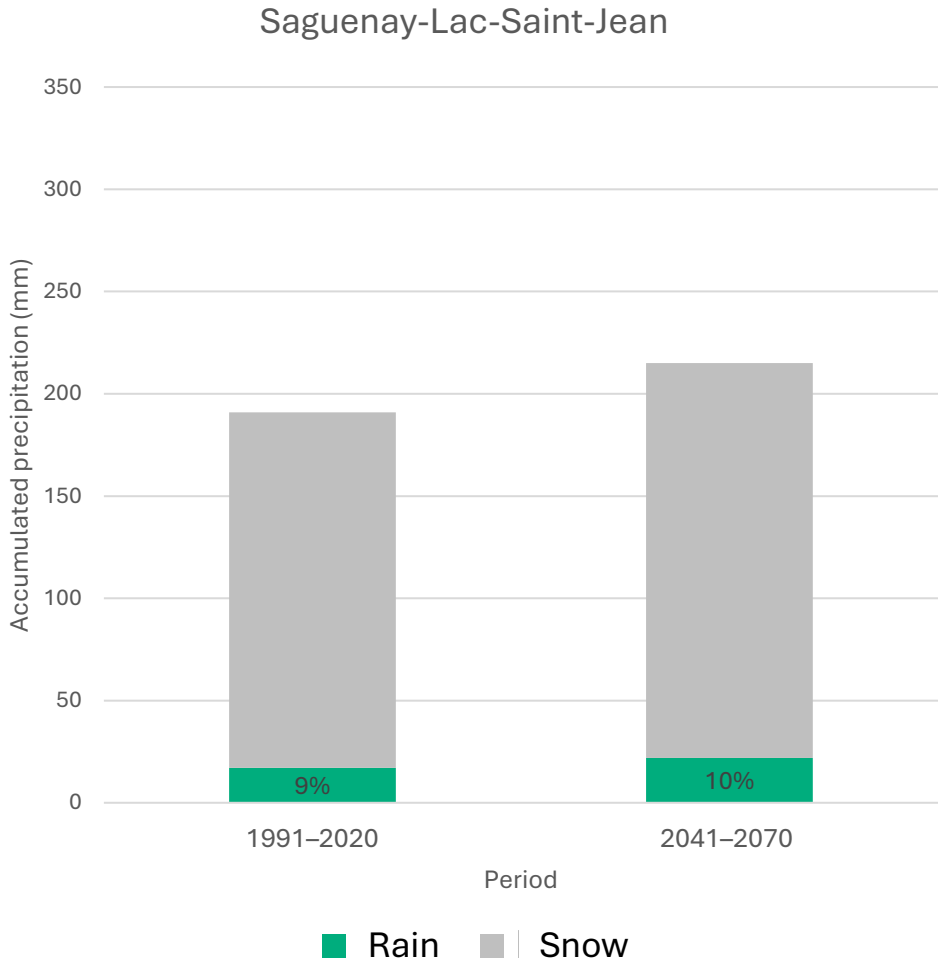
What about your region?

Number of freeze–thaw cycles in winter (days)

Region	Historically 1991-2020	Horizon 2050	Variation
Saguenay-Lac-Saint-Jean	13.2	18.9	**+5.7**
Lanaudière	17.3	23.9	**+6.6**
Centre-du-Québec	24.5	33.3	**+8.8**

Total precipitation
As rain or snow (mm) - Winter





Snow cover

Centre-du-Québec

SWE: The amount of water in liquid and solid form present in a snowpack.
1 mm SWE = 1 cm of snow

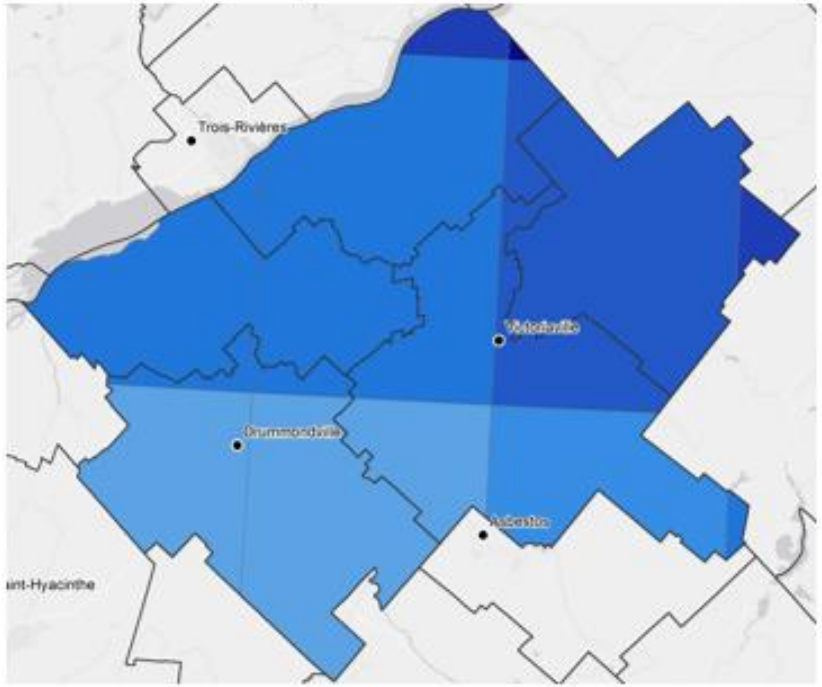
Agriclimat
Ouranos

ⓘ Based on climate modeling

Maximum surface snow water equivalent (SWE)
Projected climate time series through 2100

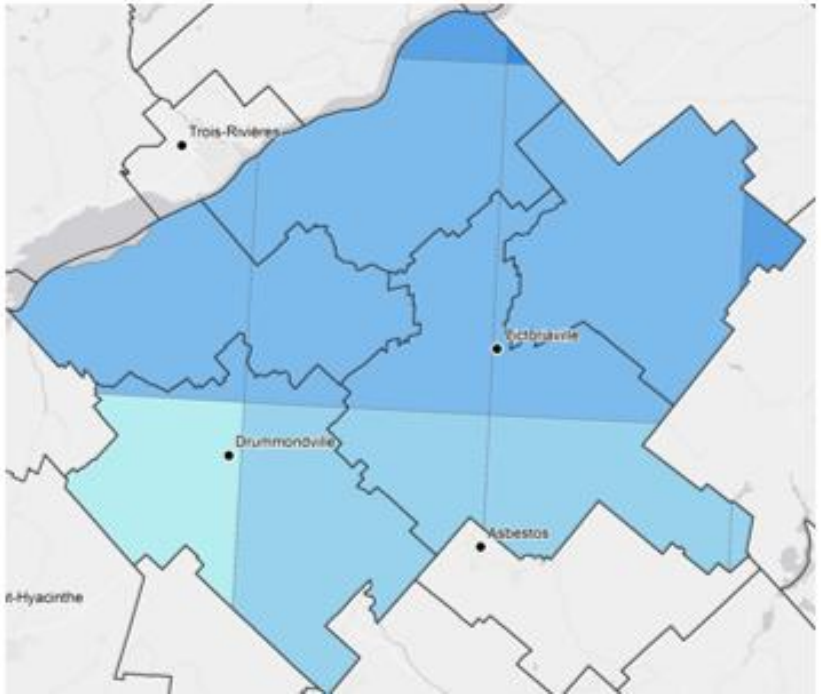
Maximum: when the snow is most thick

Historical 1999-2010



166 mm

Future 2041-2070



98 mm
Δ : - 68 mm (- 118 to - 29 mm)

Statement 1 : The winter season

«With climate change, winters will be milder and less snowy.»

- Increase in: temperature, freeze-thaw cycles, total precipitation volume
- Decrease in snow cover

Impacts on crops
Snow and ice cover for plant protection

Impacts on flowering[1]
« Umbrella bloom »

Impacts on insects[2]
Better winter survival

1 : https://www.oregoncranberrygrowers.com/content/umbrella-bloom
2 : https://extension.umaine.edu/cranberries/grower-services/insects/false-armyworm/

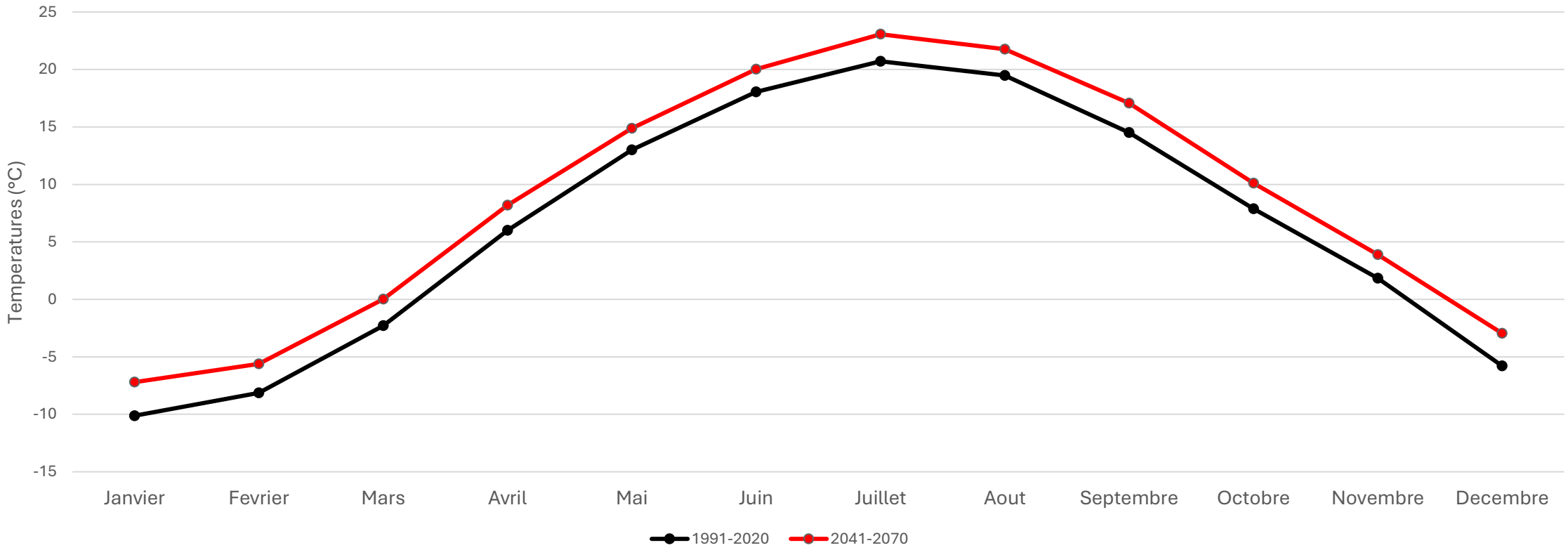
Statement 2 : Summer heat

«In Quebec, heat waves will be more frequent and more intense.»

True or false?

Monthly temperatures: overall trends

Evolution of average monthly temperatures
Seasonal variations – Centre-du-Québec

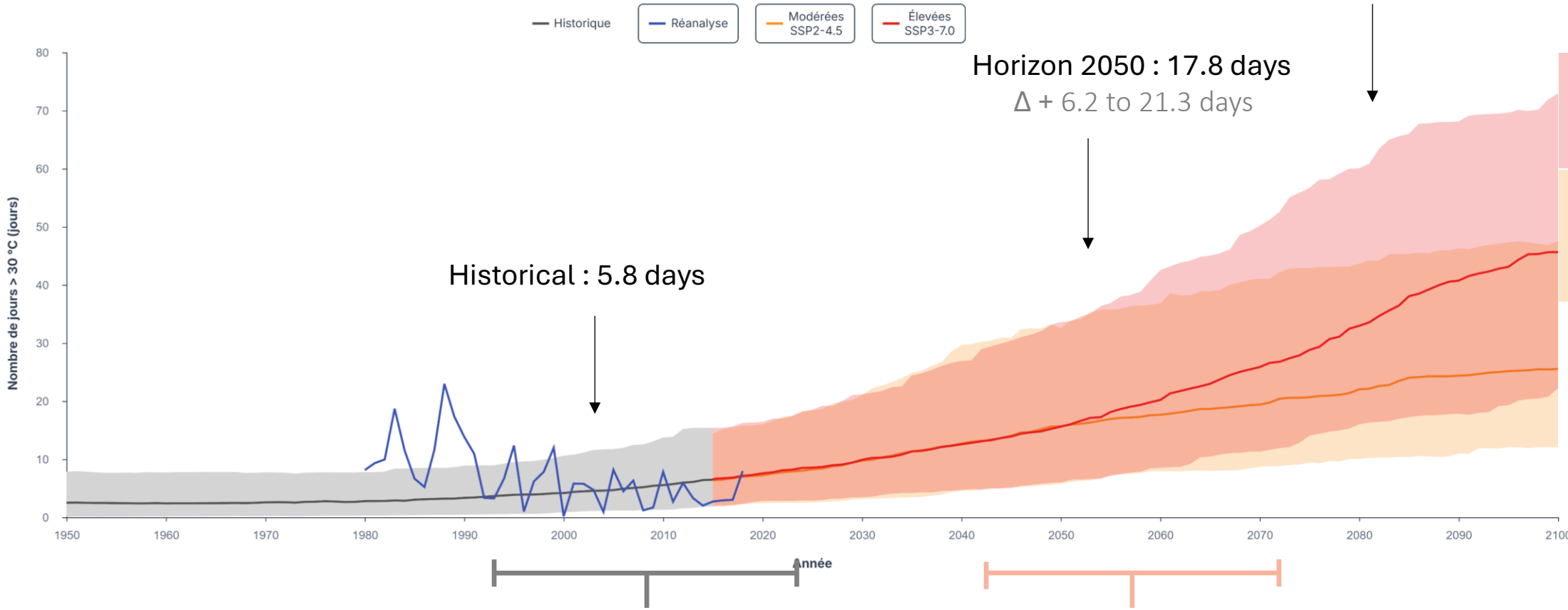


Evolution of heat waves

Centre-du-Québec

Based on climate modeling

Number of days > 30 °C (Annual)
Projected climate time series through 2100



What about your region ?

Number of days > 30 °C (Annual)

Region	Historical 1991-2020	Horizon 2050	Variation
Saguenay-Lac-Saint-Jean	1	3	**+ 2**
Lanaudière	3	9	**+6**
Centre-du-Québec	6	18	**+ 12**

Statement 2 : Summer heat

«In Quebec, heat waves will be more frequent and more intense.»

- Episodes of extreme heat will be more frequent, more intense and longer.

Impacts on fruits
Increased heat stress (scalding)

Impacts on pollinators
Potentially fewer bees

Impacts on insects
Potentially new insects

Impacts to be clarified
Harvesting difficulties
Fruit discoloration
Types and quantity of insects

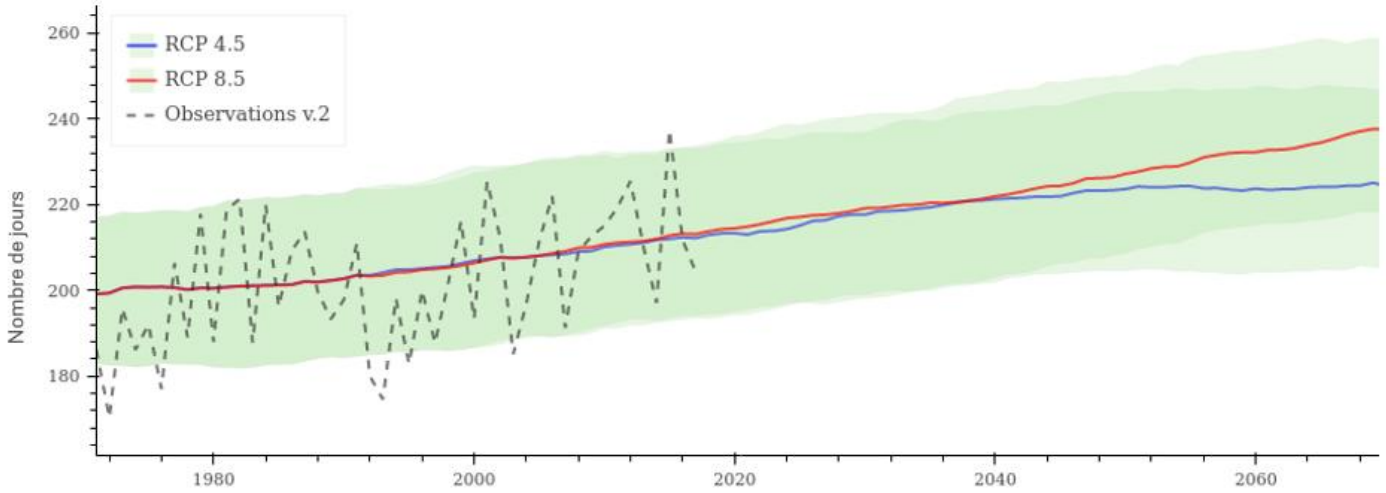
Main adaptation opportunities

Extended growing and harvesting season

Increased potential yields

Many uncertainties remain
- Growth cycle
- Harvest period
- Fruit ripening

Growing season length
1991-2020 : 209 days
2041-2070 : 226 days
Δ : + 17 days (+ 9 to + 30 days)



Statement 3 : Summer precipitation

« With climate change, the total amount of precipitation will increase during the summer. »

True or false?



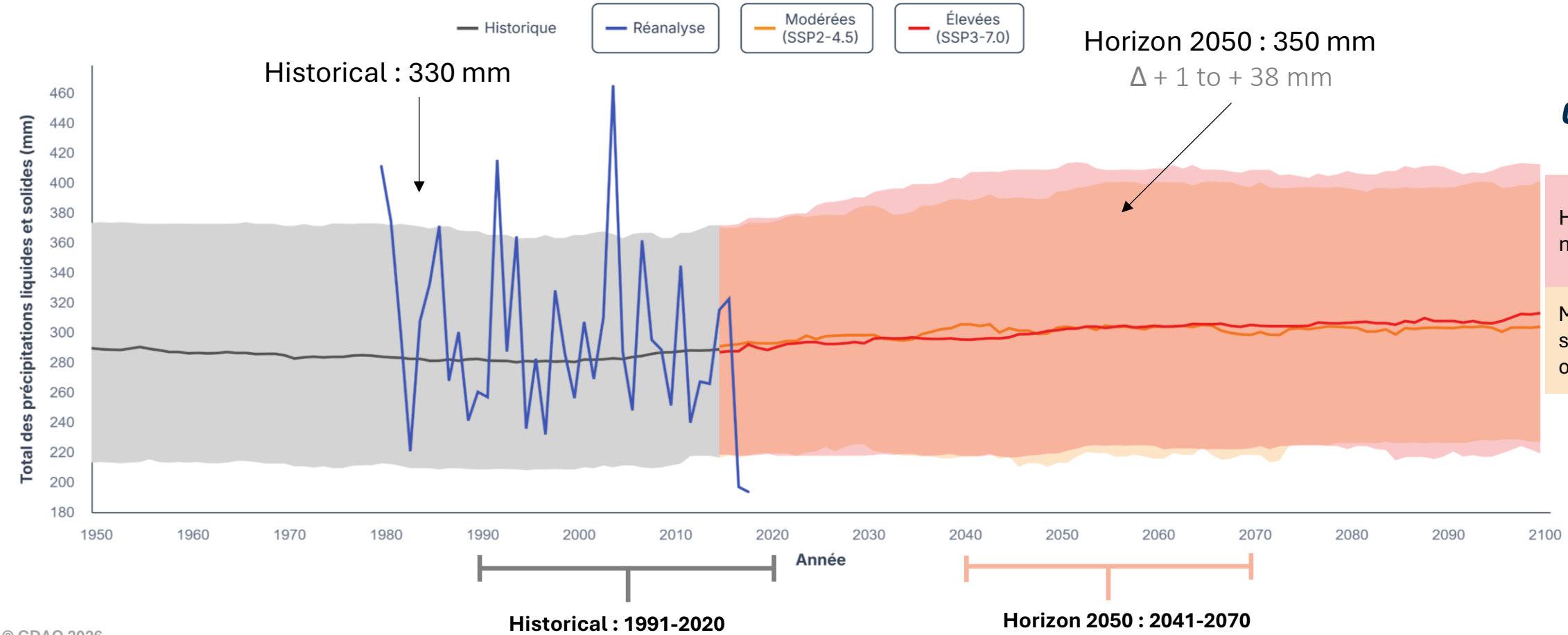

Summer precipitation evolution

Centre-du-Québec

Based on climate modeling

Total liquid precipitation – Summer (June, July, August)

Projected climate time series through 2100



High scenario margin of error

Moderate scenario margin of error

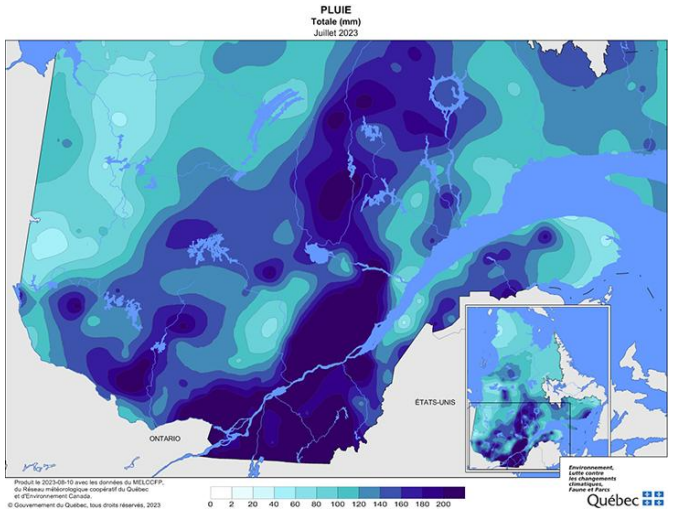
What about your region?

Total liquid precipitation (mm) – Summer (June, July, August)

Region	Historical 1991-2020	Horizon 2050	Variation
Saguenay-Lac-Saint-Jean	297	313	**0 to + 31**
Lanaudière	313	323	**-6 to +28**
Centre-du-Québec	330	350	**+1 to +38**

Years that follow one another but are not alike

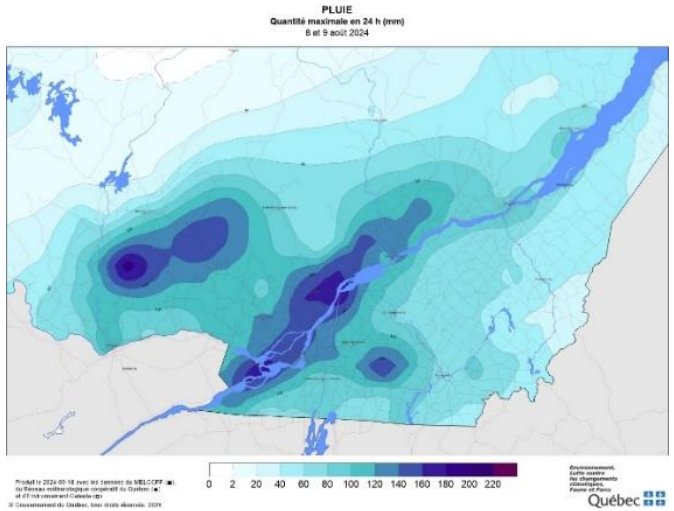
2023



Extremely rainy in July

Over **700 mm** of rain in certain places

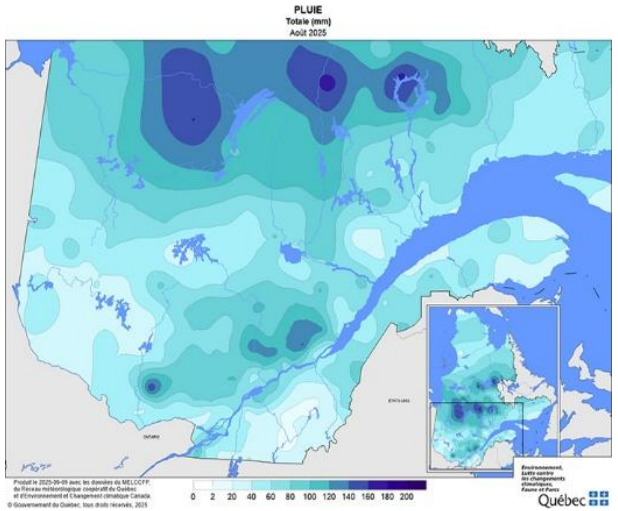
2024



Post-Tropical Storm Debby : Localized heavy rainfall

Over **125 mm in 6h**

2025



A very dry August

Only **13 mm** of rain in Sherbrooke

Source :

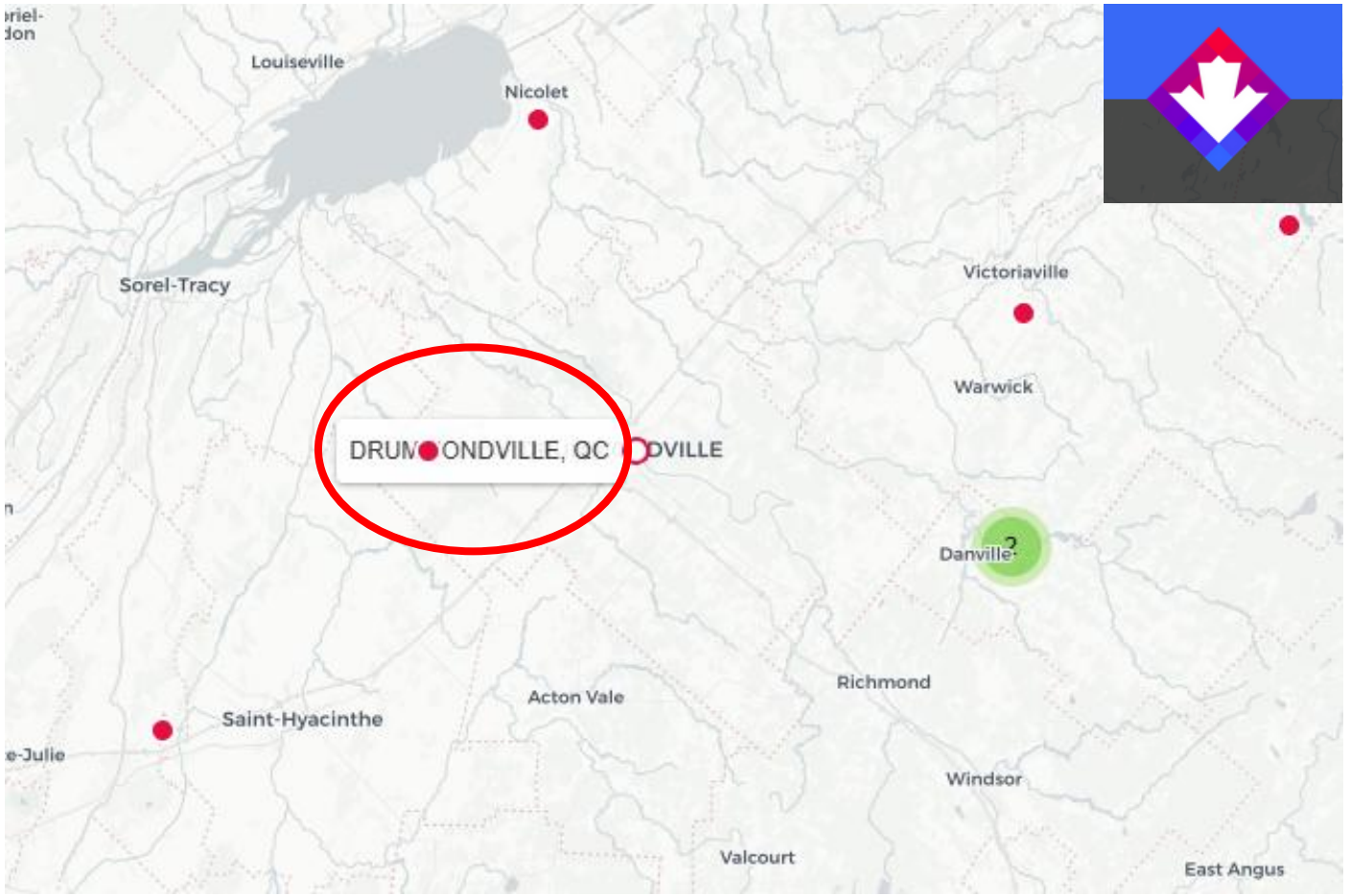
Intensity and frequency of precipitation

Climate Data - Canada :

- For **Drummondville**

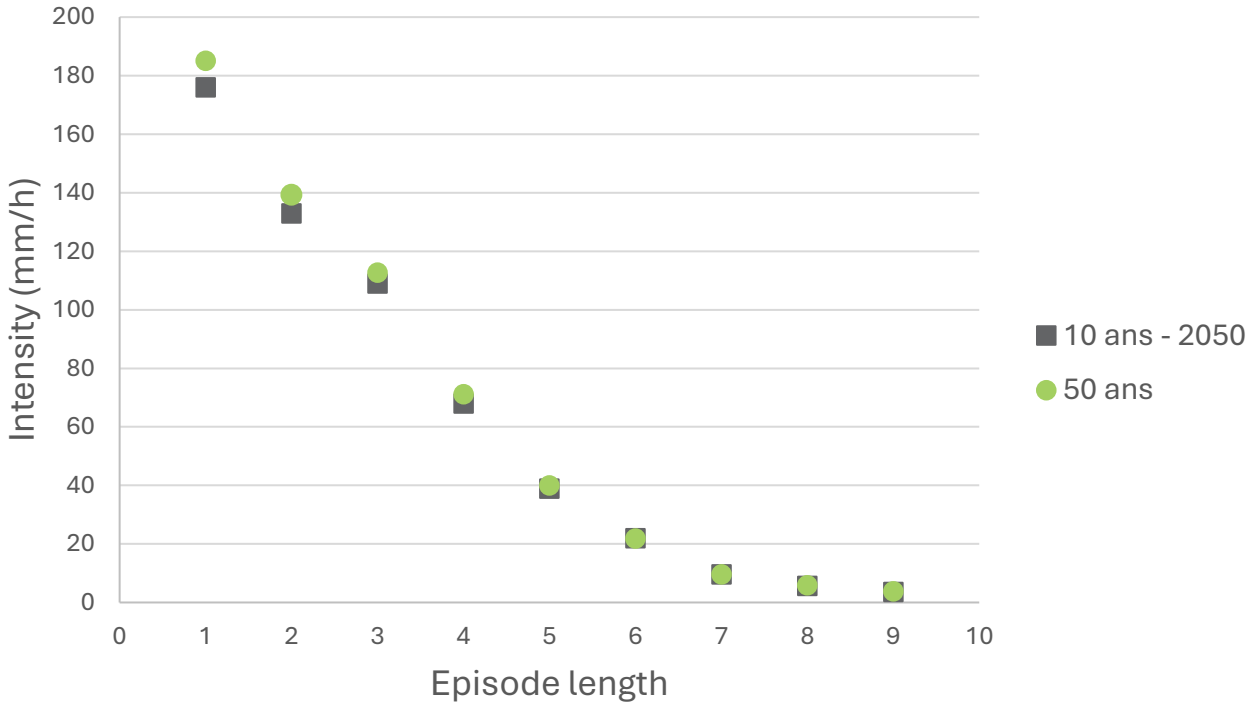
What we currently know:

- The rarer and shorter an episode is, the **higher the intensity.**
- The more frequent and longer an episode is, the **lower the intensity.**



Intensity and frequency of future precipitation

IDF observed and simulated in Drummondville
Horizon 2050, median climate scenario (SSP 2-4.5)



Future

- For the same intensity

→ Episodes of intense rainfall will be more frequent

- For the same frequency

→ The maximal intensity of rainfall will increase

Events that we knew every 50 years, will now happen every 10 years

Length and frequency of dry periods

Centre-du-Québec – During the growing season

Dry periods of 7 days or more		
	Total length (days)	**Frequency (number)**
1991-2020	51.6	5.5
2041-2070	58.3	6.0
Δ	**+6.7** (- 3.5 to +15.5)	**+ 0.6** (- 0.5 to + 1.7)

→ Increase in the **length** of dry periods

→ Increase in **frequency** of dry periods

Sequences of at least 7 days without precipitation (less than 1 mm per day)

Impacts on water availability

Groundwater (artesian wells and deep wells):

- Slight increase and shift in groundwater recharge

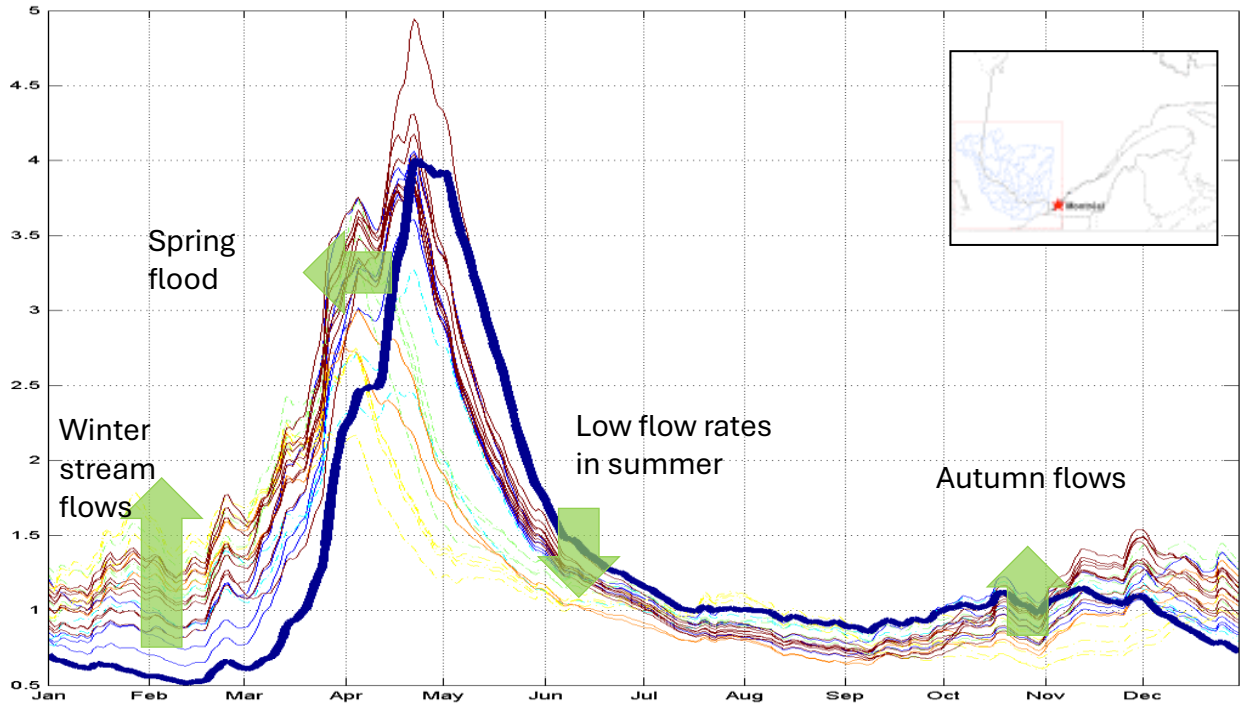
→ No issues for groundwater

Surface water (irrigation pond, surface well, stream)

- Higher stream flows in winter and autumn, lower flows in summer

→ Potential challenges for surface water

Based on 25 simulations
Outaouais River Basin



Statement 3 : Summer precipitation

« With climate change, the total amount of precipitation will increase during the summer. »

- The total amount of precipitation will remain **stable**
- However, the precipitation pattern will be modified

Impacts on fruits[1]
Susceptible to infections (berry rot)

Impacts on flowers
Petals being torn off

Impacts on pollination
Pollen leaching
Fewer active pollinators

Impacts

Increased risk of water stress, water shortages and heavy precipitation

- Issues related to water use on the farm
- Issues related to excess water

Increased risk of winter mortality

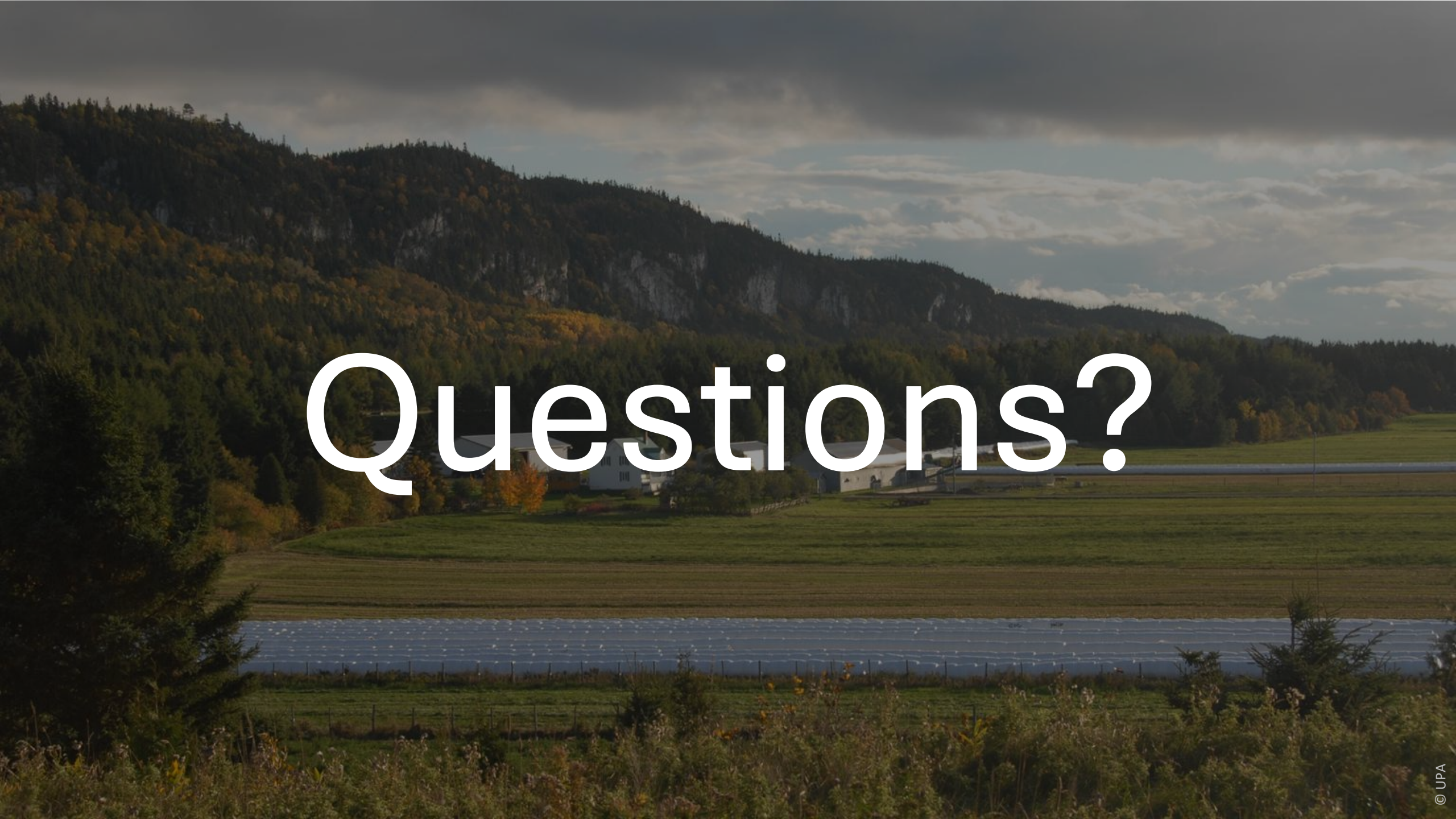
- Issues with plant survival in winter
- Issues with ice protection

Increased competition from certain crop pests

- Potentially new pests and diseases
- Potentially new weeds

Other risks related to heat

- Potential effects of heatwaves on fruit
- Potential effects on the harvest
- Potential effects on pollinators


Questions?
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