Climate Change Projections for Newfoundland and Labrador Late 20th Century to Mid 21st Century

Summary Presentation
June 2013

OFFICE OF
CLIMATE CHANGE
ENERGY EFFICIENCY
& **EMISSIONS TRADING**

Content

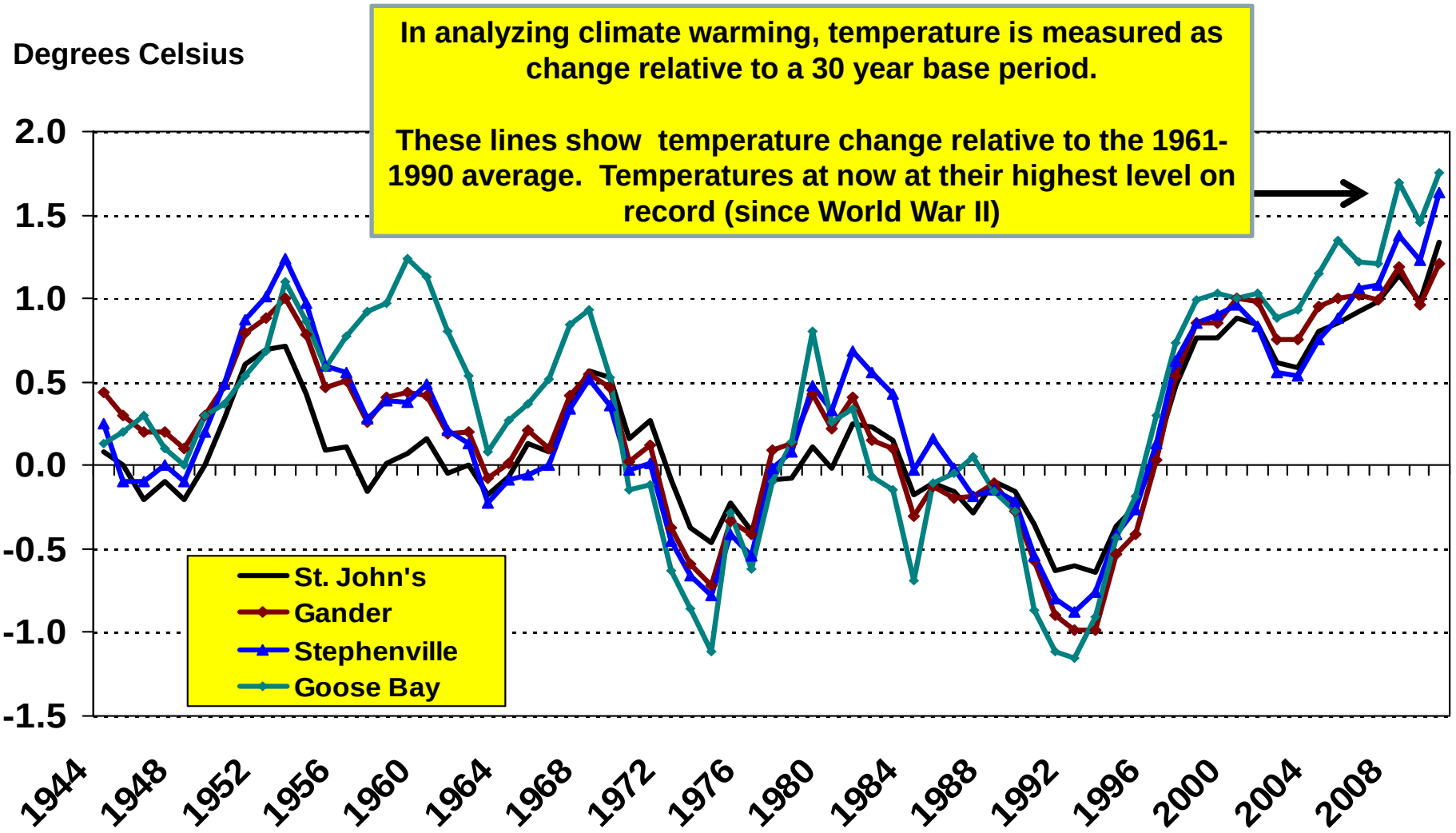
1. Introduction

Climate change is happening

- **Atmospheric concentration of greenhouse gases is growing**
  - **Approaching dangerous levels**
- **Global temperatures are rising**
  - **Temperatures at highest level in 4,000 years – or about the time the Egyptian pyramids at Giza were built**
- **Provincial temperatures are rising *(see next chart)***
  - **Warmest years on record have occurred in the past 15 years**
- **Increasing number of hurricanes and tropical storms hitting the province *(see chart below)***
  - **Storms, like Hurricane Igor (2010) and Tropical Storm Leslie (2012), are causing infrastructure damage and significant costs**

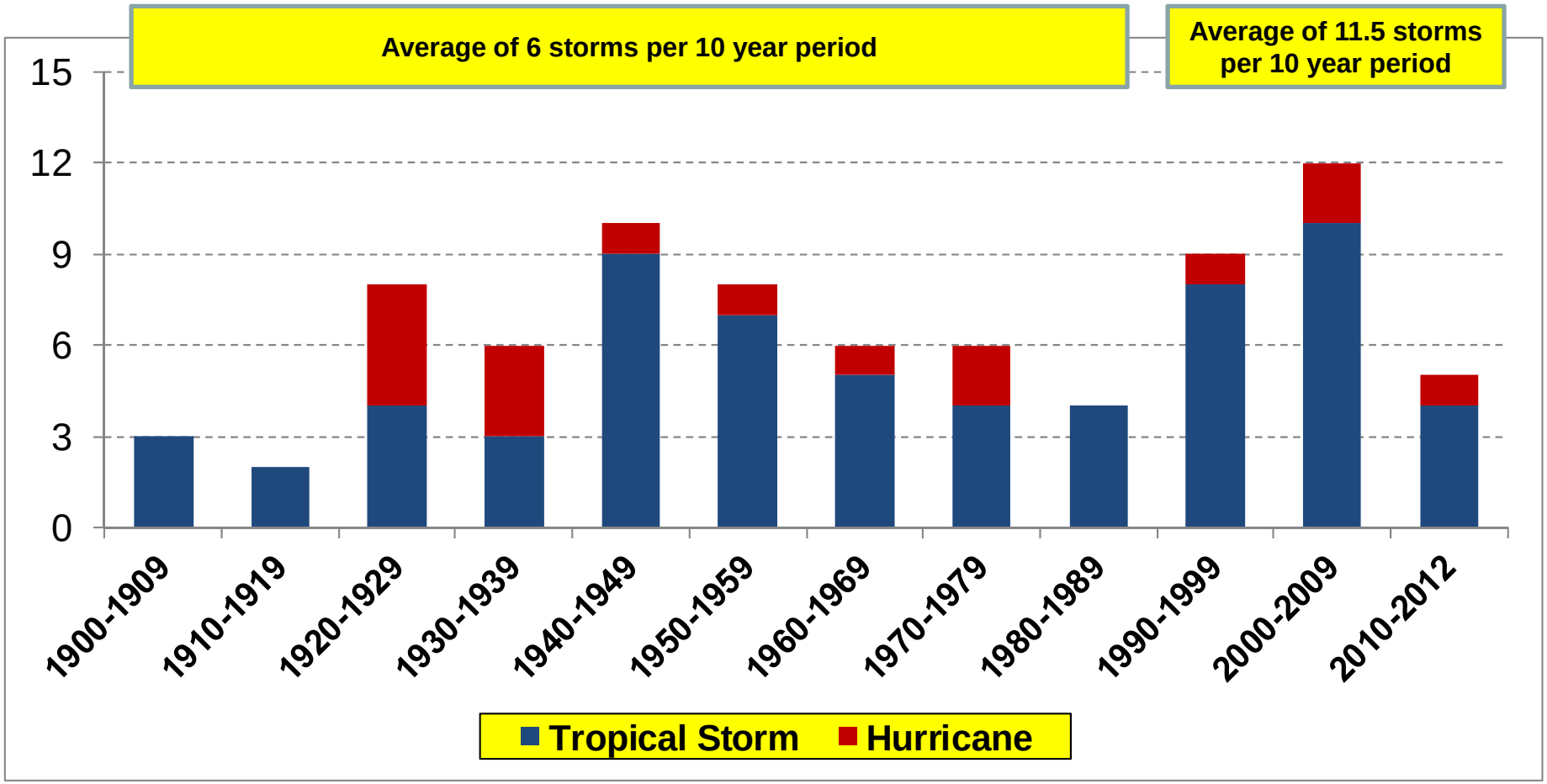
Temperatures in the province are rising and are at record levels

Newfoundland Labrador



Source: Calculated from Environment Canada historical data. Actual temperature levels vary by location; however, deviation from the 1961-1990 average is similar for each location.

We are subject to twice as many tropical storms and hurricanes now than in the past



Includes tropical storms and hurricanes that made landfall in the province registered by the Canadian Hurricane Center, Environment Canada. Hurricanes include those that made landfall only.

What is the study about?

- **This study examined weather changes – temperature, precipitation and extreme weather events – for Newfoundland and Labrador**

- **Measures change from the end of the 20th century (1968-2000) to the mid 21st century (2038-2070)**

- **These projections were developed by down-scaling global climate projection models**

Why did we do this project?

- **Climate change is happening**
- **Changes will be significant over time, and will impact on different interests in different ways**
- **Governments, businesses, individuals and communities need information to plan**
- **Better information leads to better planning and better decision making**
- **And better decision making reduces risks and costs**

2. Approach to the Study

Regional climate projection models are available for North America

- **Regional climate models are down-scaled from global climate projection models**
  - **50 km by 50 km projection area**
- **Models project temperature and precipitation change**
  - **No projections for wind, fog or sea surge**
- **Many sub-national jurisdictions and regions in North America have developed down-scaled climate projections**

A comprehensive set of projections

- Projections developed for Newfoundland and Labrador
- Used 7 regional simulations from 4 global climate models
- Used 18 weather stations for temperature and precipitation
- Used 19 weather stations for extreme precipitation events
- Projected 19 temperature and precipitation variables
- Projected extreme precipitation for 3 intervals for 6 return periods
- Site-specific data available
- Projections produced by Dr. Joel Finnis, a Climatologist at Memorial University, Newfoundland and Labrador

26 regionally dispersed weather stations included in the project

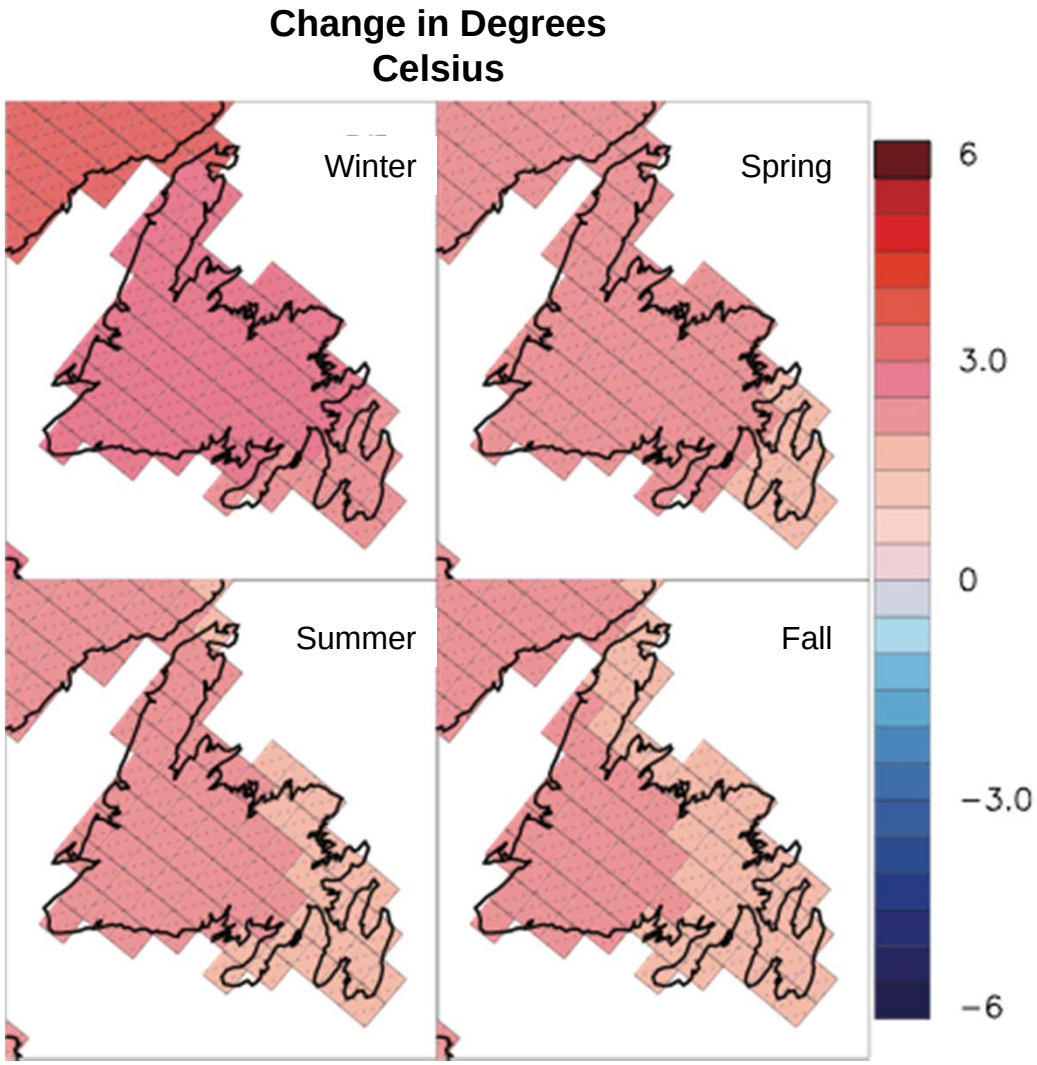
Projections	Newfoundland		Labrador
Temperature and Precipitation	Bay d'Espoir	Grand Falls-Windsor	Cartwright
	Corner Brook	Plum Point	Churchill Falls
	Daniel's Harbour	Port aux Basques	Goose Bay
	Deer Lake	St. Anthony	Hopedale
	Exploit's Dam	St. John's	Nain
	Gander	Stephenville	Wabush
Extreme Precipitation Events	Argentia	Port aux Basques	Battle Harbour
	Burgeo	St. Alban's	Churchill Falls
	Comfort Cove	St. Anthony	Goose Bay
	Daniel's Harbour	St. Lawrence	Mary's Harbour
	Deer Lake	St. John's	Nain
	Gander	Stephenville	Wabush
	LaScie		

Climate variables included in project

Projections	Newfoundland		
Temperature (8)	Daily mean Daily minimum Daily maximum	Heating degree days Cooling degree days Growing degree days	Number of days with frost Maximum heat wave duration
Precipitation (11)	Mean daily Mean intensity of events Number of events with 10+ mm	Maximum 3-day Maximum 5-day Maximum 10-day 90th percentile of events	Maximum number of consecutive dry days Mean dry spell Median dry spell Standard deviation – dry spell
Extreme Precipitation (3 x 6)	<u>Intervals</u> 6 hours 12 hours 24 hours	<u>Return periods</u> 2 years 25 years 5 years 50 years 20 years 100 years	

3. Key Findings: Temperature and Precipitation

Temperatures are projected to rise by between 2º and 3º C by mid 21st century

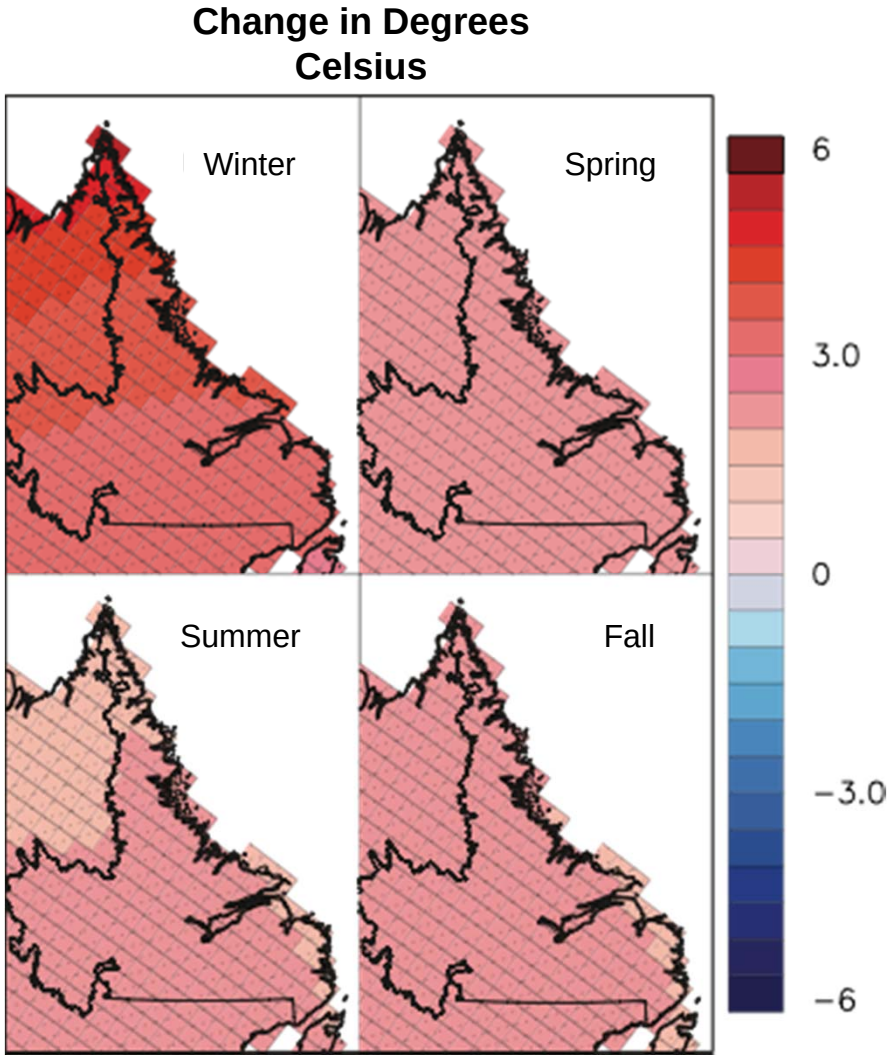


Small temperature changes are significant. For example, scientists estimate that the temperature during the last Ice Age was only 5.5ºC lower than present temperatures.

During the winter season, average daily temperature is expected to rise by about 3ºC in all regions on the island.

During the spring, summer and fall seasons, temperature growth will be relatively stronger on the central and western half of the island.

Temperatures are projected to rise by between 3º and 4º C by mid 21st century

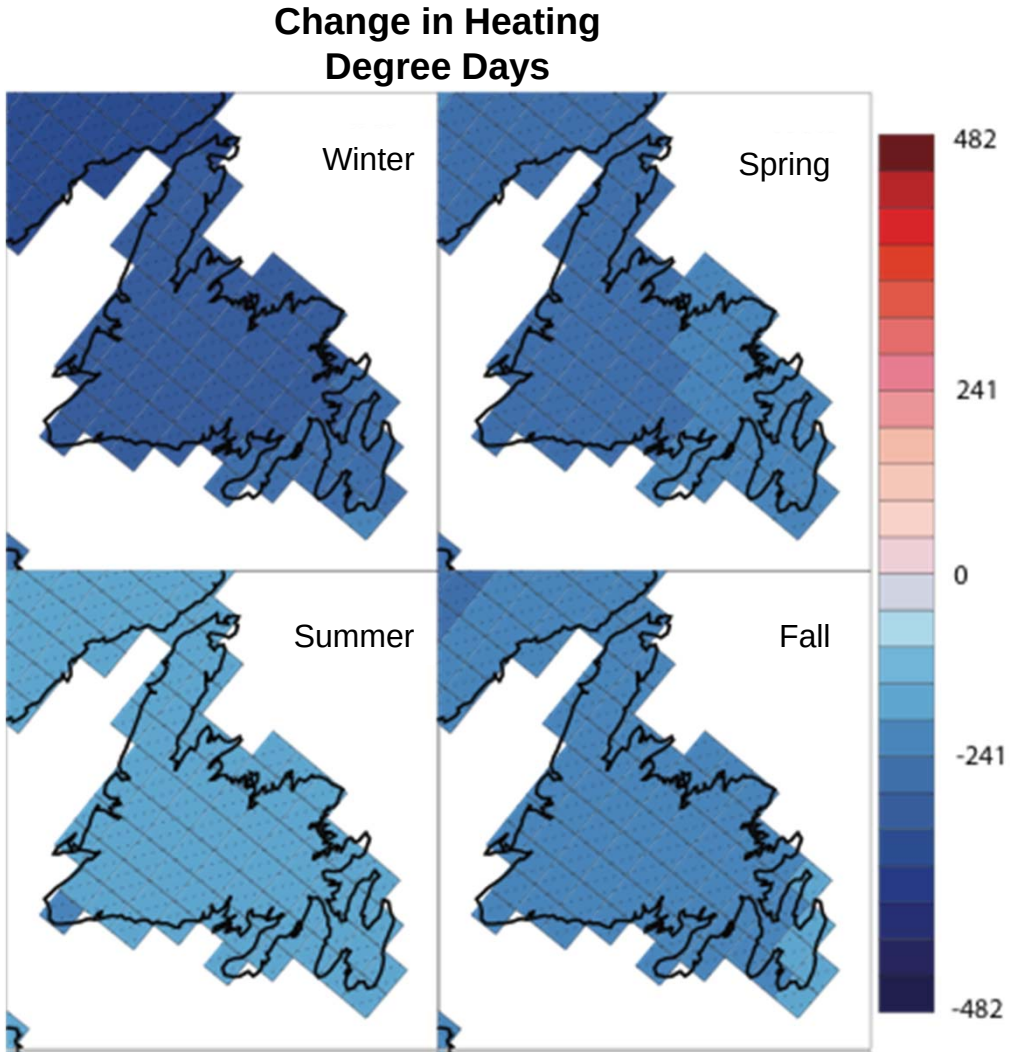


Small temperature changes are significant. For example, scientists estimate that the temperature during the last Ice Age was only 5.5ºC lower than present temperatures.

During the winter season, average daily temperature is expected to rise by over 3ºC in all regions, particularly northern Labrador.

During the spring, summer and fall seasons, temperature growth will be about 3ºC in all regions, with slightly less temperature growth along the southeast coast and Straits.

Temperature rise will result in fewer “heating degree days”, meaning less demand for energy to heat buildings

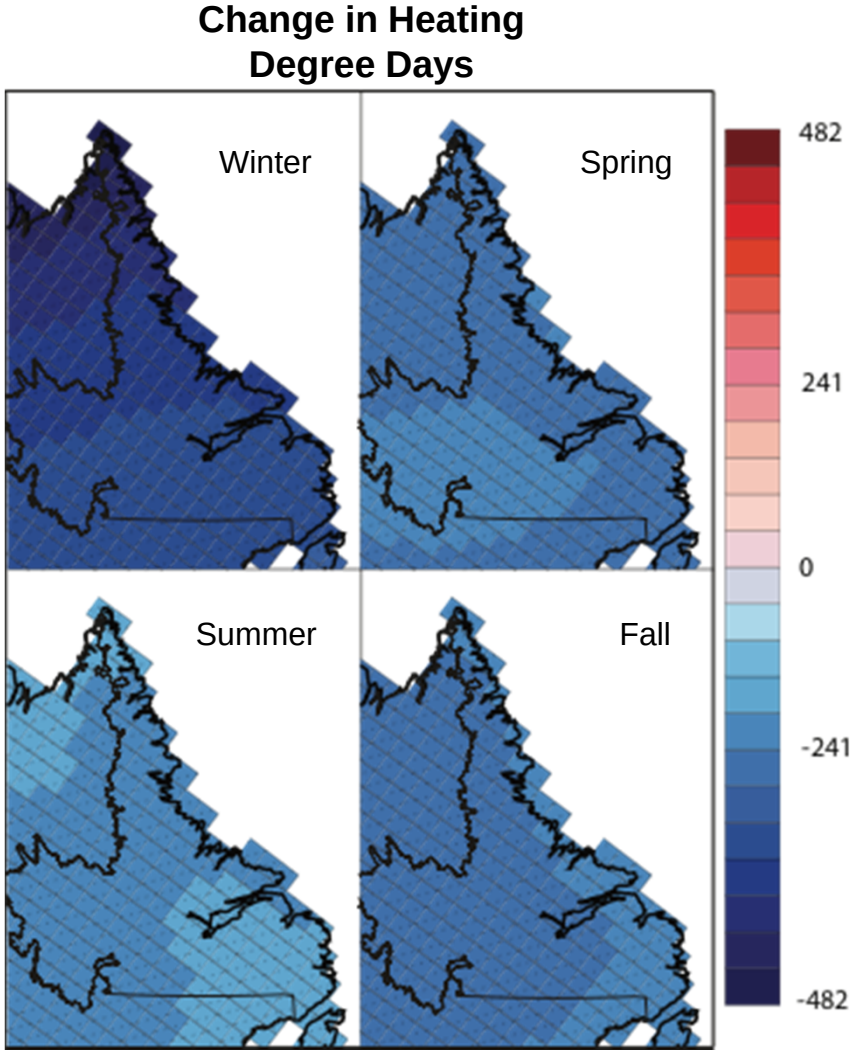


“Heating degree day” (HDD) reflects the demand for energy to heat a building, calculated as the difference between mean temperature and 16ºC for those days when the mean temperature is less than 16ºC.

In winter, HDDs are expected to decline by almost 500 by mid century, or by about 12% from current levels on the island.

HDDs are expected to decline in the spring and fall as well, by about 13% in most locations.

Temperature rise will result in fewer “heating degree days”, meaning less demand for energy to heat buildings



“Heating degree day” (HDD) reflects the demand for energy to heat a building, calculated as the difference between mean temperature and 16ºC for those days when the mean temperature is less than 16ºC.

In Labrador, HDDs are expected to decline by almost 500 by mid century in winter, or by about 12% from current levels.

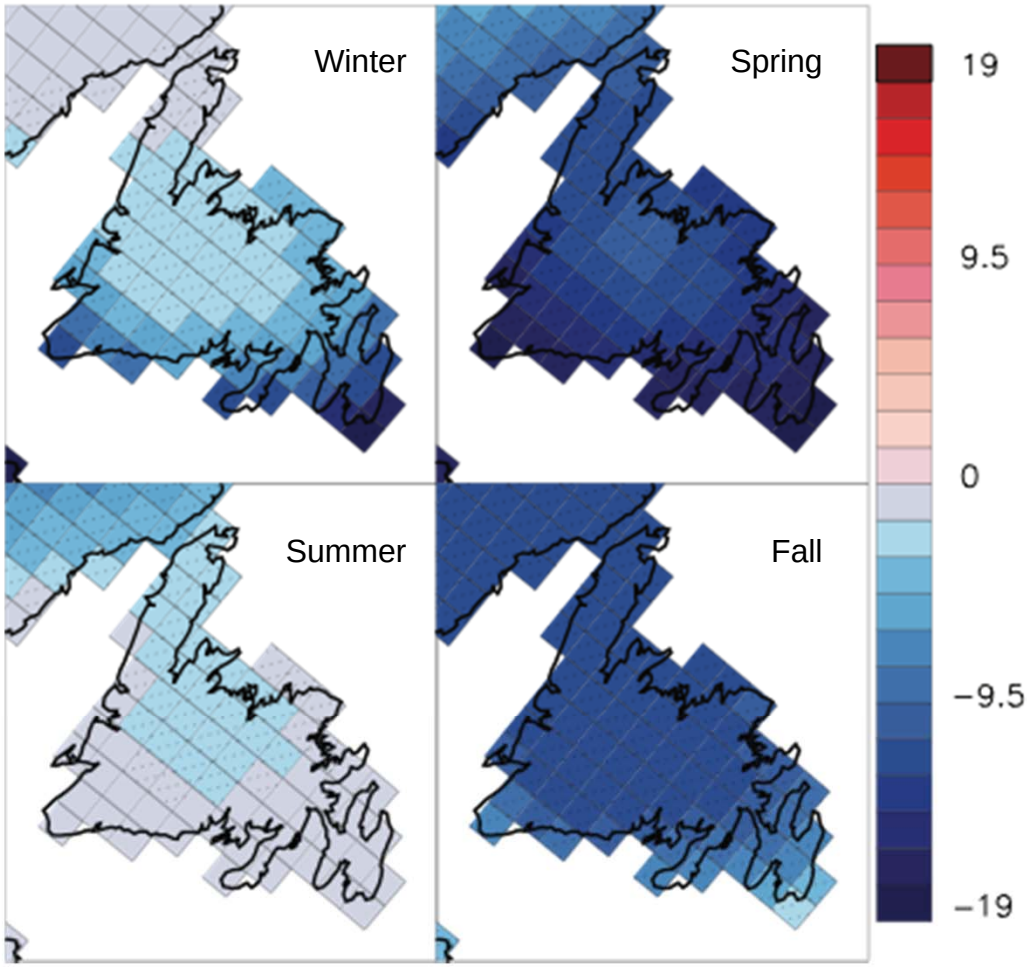
HDDs are expected to decline in the spring and fall as well, by about 10% to 12% in most locations.

HDDs expected to decline by between 33% to 50% in summer.

Temperature rise will mean fewer days with frost, meaning a shorter winter

Newfoundland Labrador

Change in Number of Days with Frost



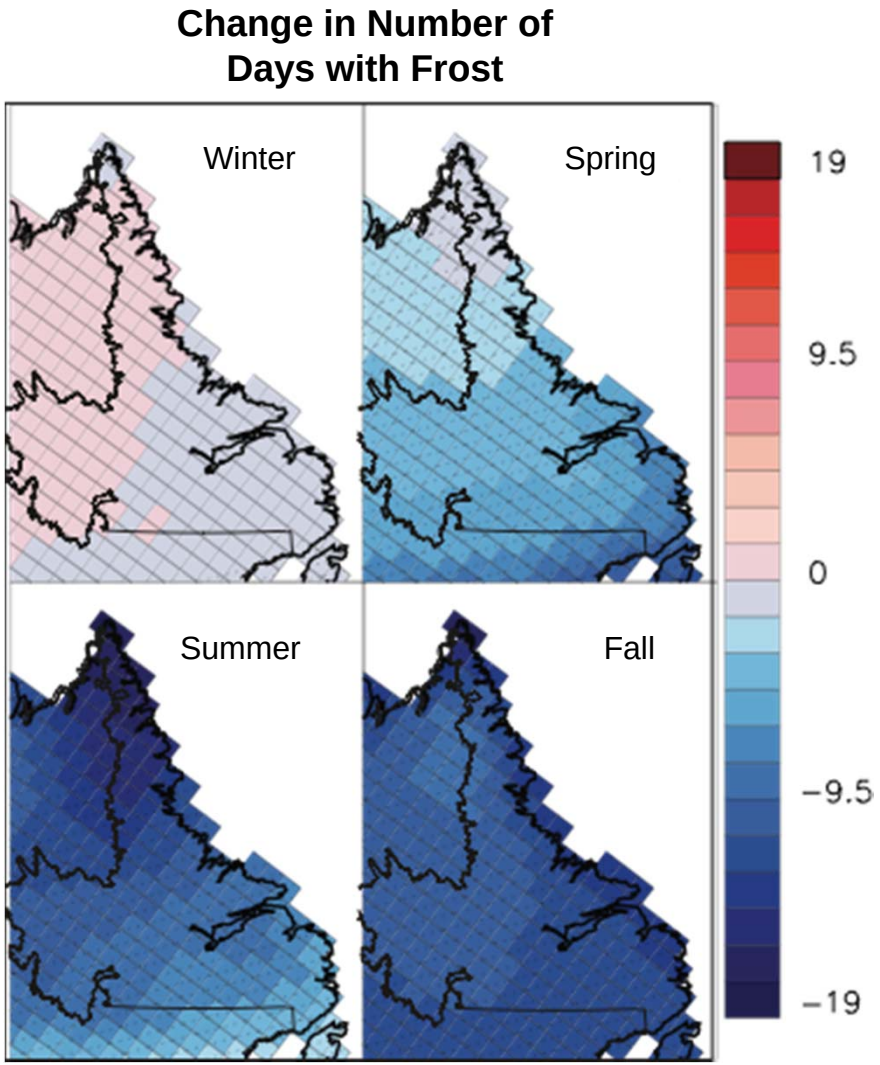
Frost days can be used as a proxy for winter length and severity.

The number of days with frost is expected to decline by between 25 (3.5 weeks) and 32 (4.5 weeks) on the island.

Most changes will occur in the spring and fall months.

During winter, the southern areas of the island will experience the most change (about a 15% decline in frost days).

Temperature rise will mean fewer days with frost, meaning a shorter winter



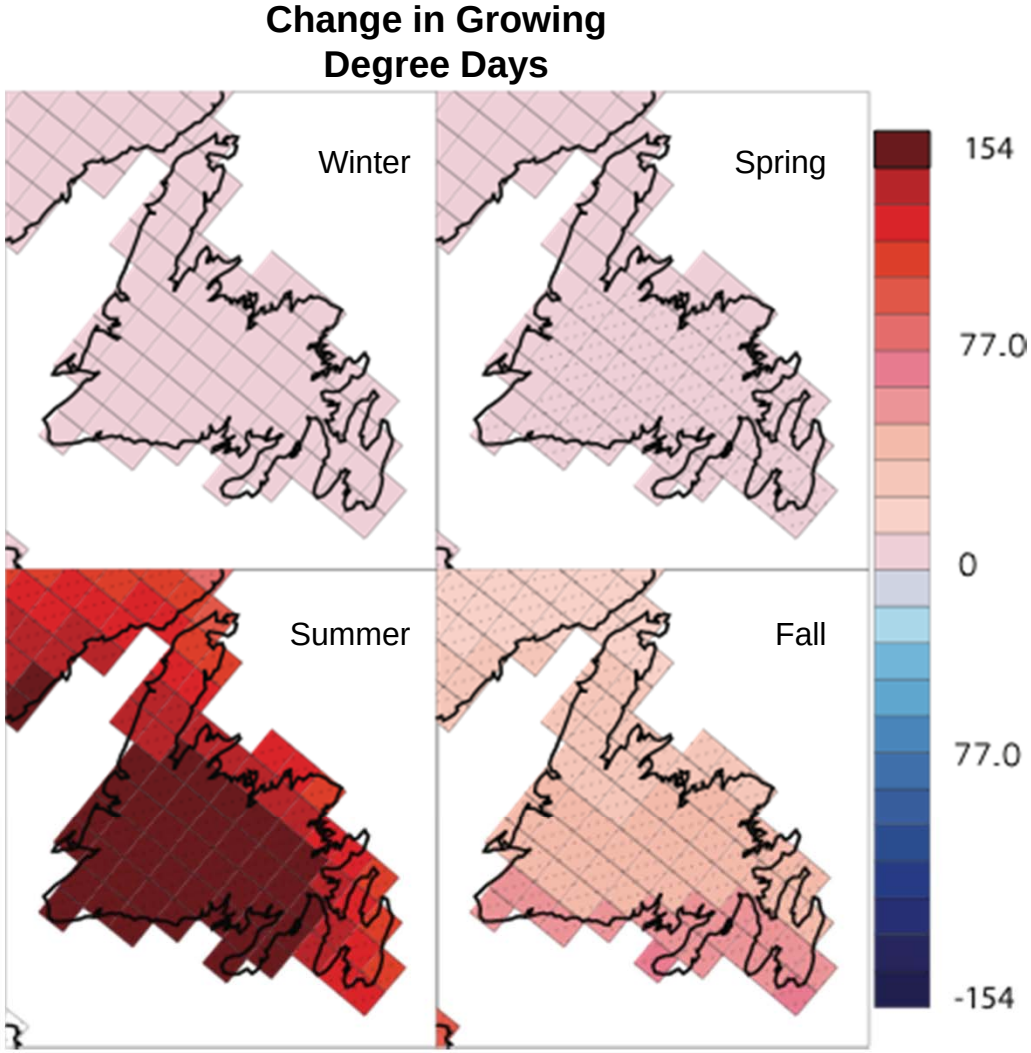
Frost days can be used as a proxy for winter length and severity.

In Labrador, the number of days with frost is expected to decline by between 21 (3 weeks) and 28 (4 weeks).

The number of days with frost will decline, in particular, during the summer and fall months.

There will be relatively less decline in the spring, and virtually no change in the number of days with frost during the winter months.

Temperature rise will result in more “growing degree days”, meaning longer growing seasons

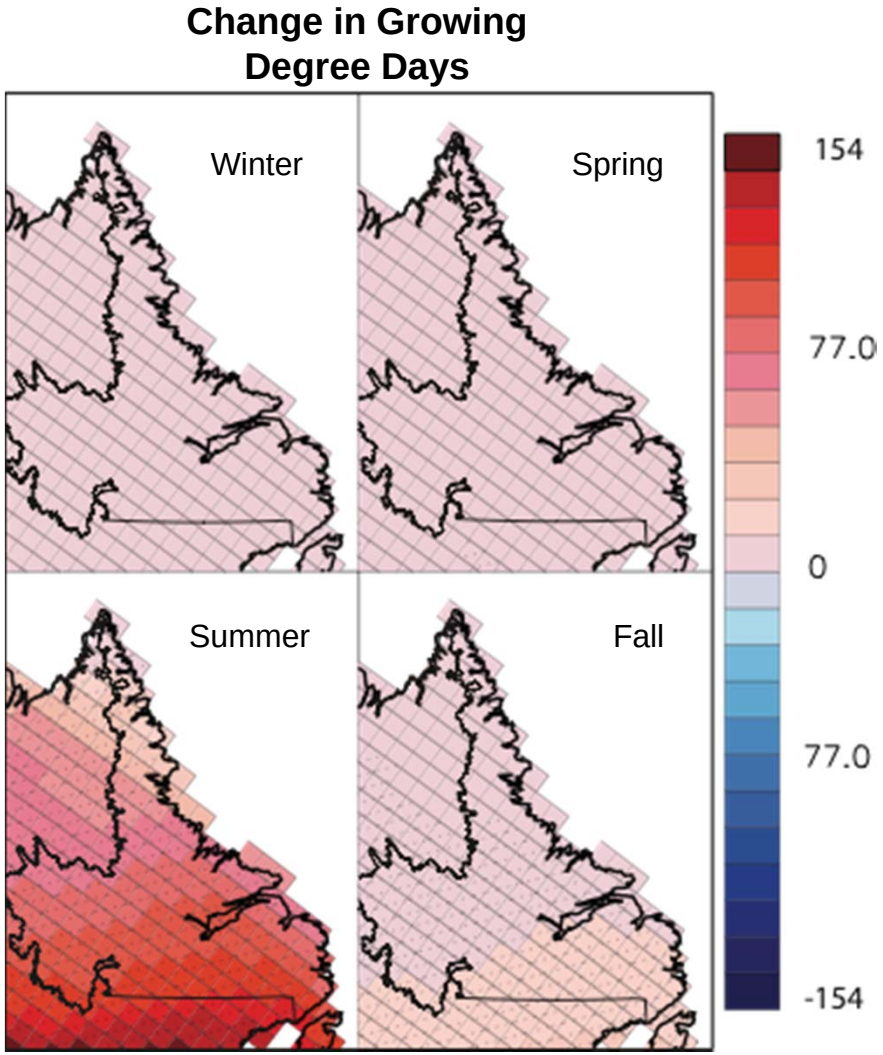


“Growing degree day” (GDD) reflects the availability of heat for outdoor growing, calculated as the difference between mean temperature and 10ºC for those days when the mean temperature is higher than 10ºC.

GDDs are expected to increase by about 30% to 35% in the summer months, with the most absolute change occurring in central and western areas of the island.

There is relatively little change in the winter and spring months, with some growth in GDDs during the fall months.

Temperature rise will result in more “growing degree days”, meaning longer growing seasons



“Growing degree day” (GDD) reflects the availability of heat for outdoor growing, calculated as the difference between mean temperature and 10ºC for those days when the mean temperature is higher than 10ºC.

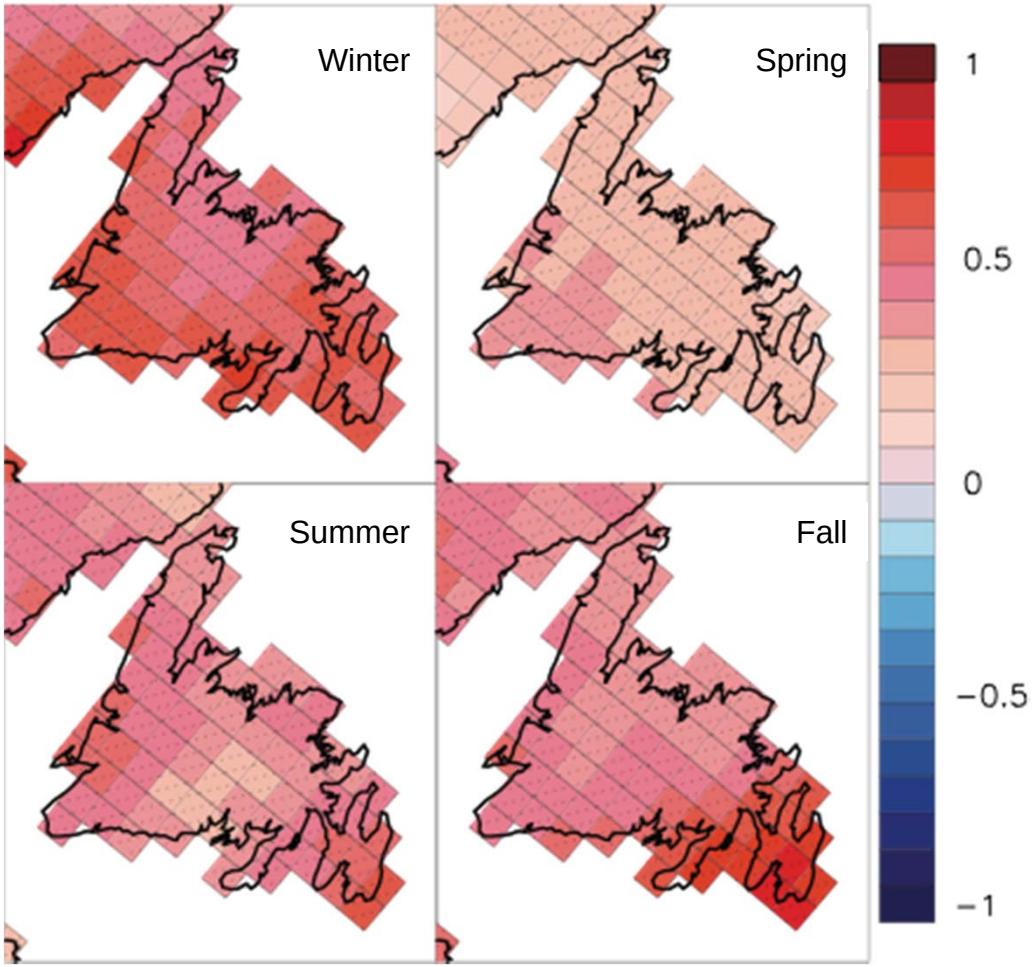
In Labrador, GDDs are expected to increase by about 30% to 35% in the summer months, particularly in southern regions.

There is relatively little change in the remaining three seasons, and the absolute number of GDDs remains low in these seasons.

Precipitation events, on average, will be more intense particularly during fall and winter

Newfoundland Labrador

Change in mm/day for those days with precipitation



The average amount of precipitation per precipitation event is expected to increase by about 5% across all seasons and all regions of the island.

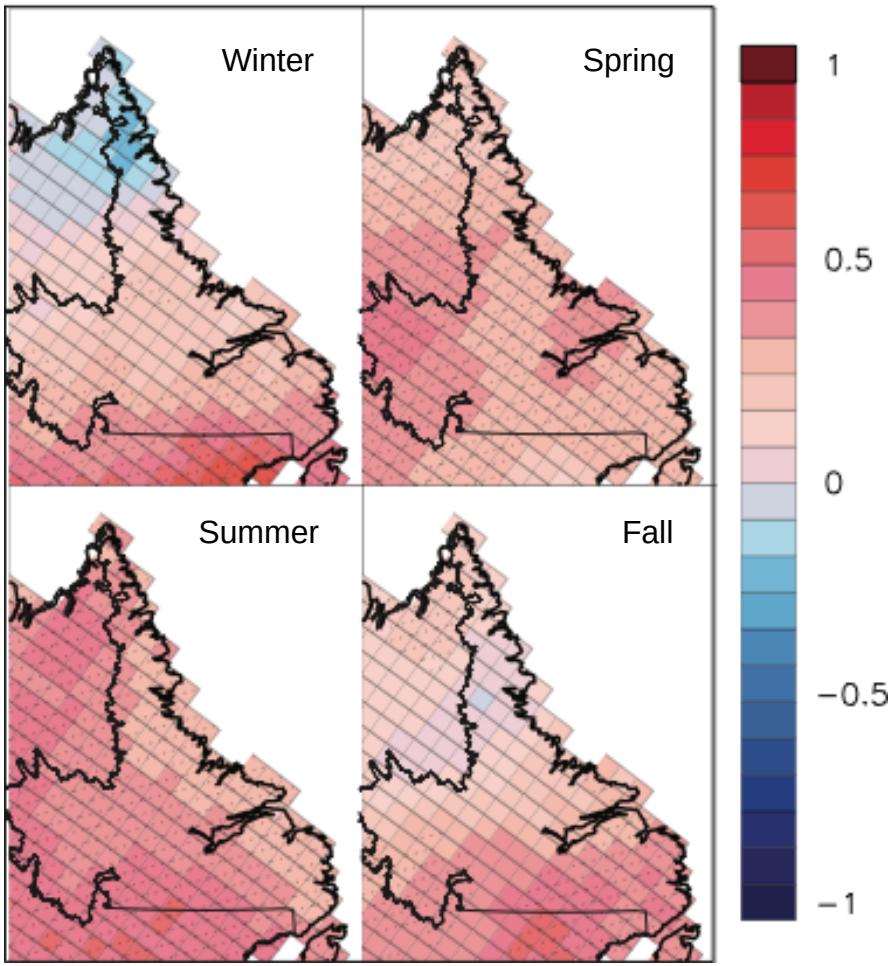
The absolute level of precipitation is expected to increase the most during the winter months and during the fall months for the Avalon Peninsula.

The absolute level of precipitation is expected to increase the least during the spring months.

Precipitation events, on average, will be more intense particularly during fall and winter

Newfoundland Labrador

Change in mm/day for those days with precipitation



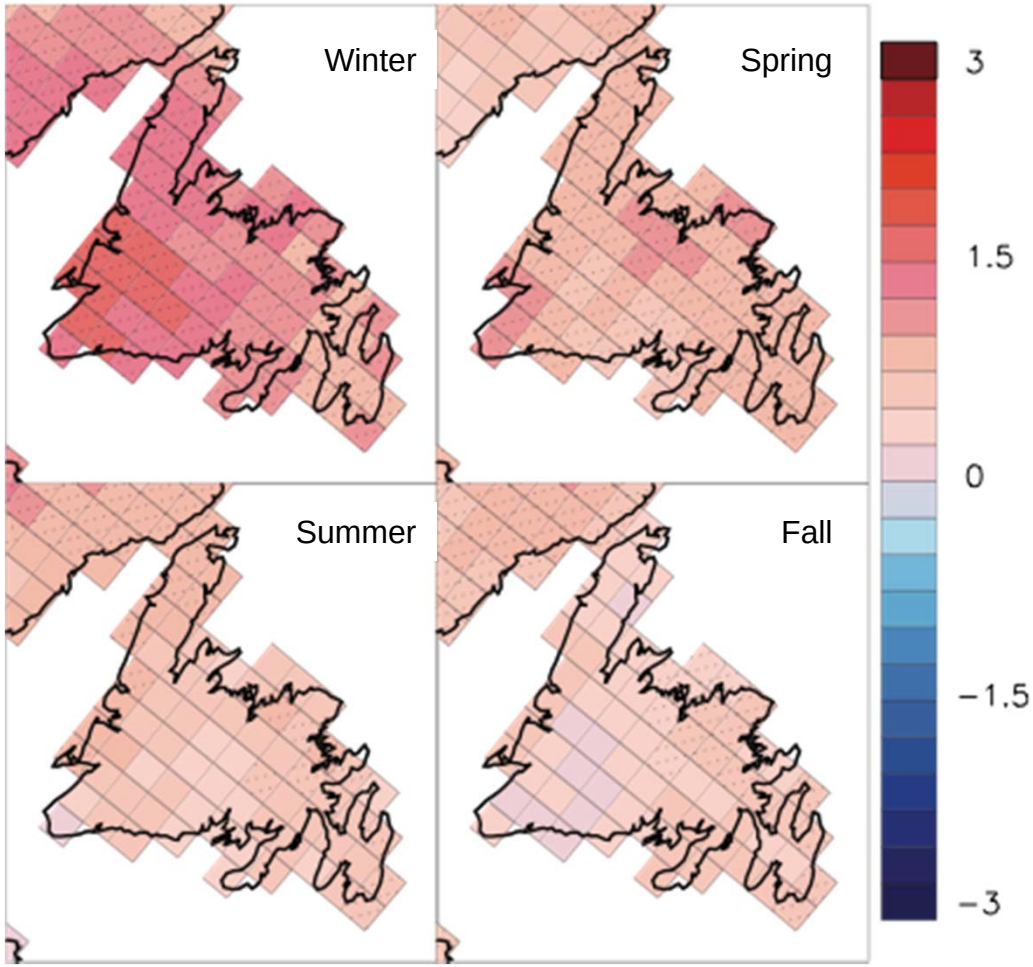
The average amount of precipitation per precipitation event is expected to increase by about 5% across all seasons and all regions of Labrador.

In Labrador, the absolute level of precipitation is expected to increase the most during the summer months and during the fall and winter months for more southerly regions.

The absolute level of precipitation is expected to decrease during the winter months north of Saglek Bay.

There will be more days with high levels of precipitation (10 mm or more)

Change in number of days with precipitation of 10 mm or more



Higher levels of precipitation can lead to increased risk of flooding and erosion.

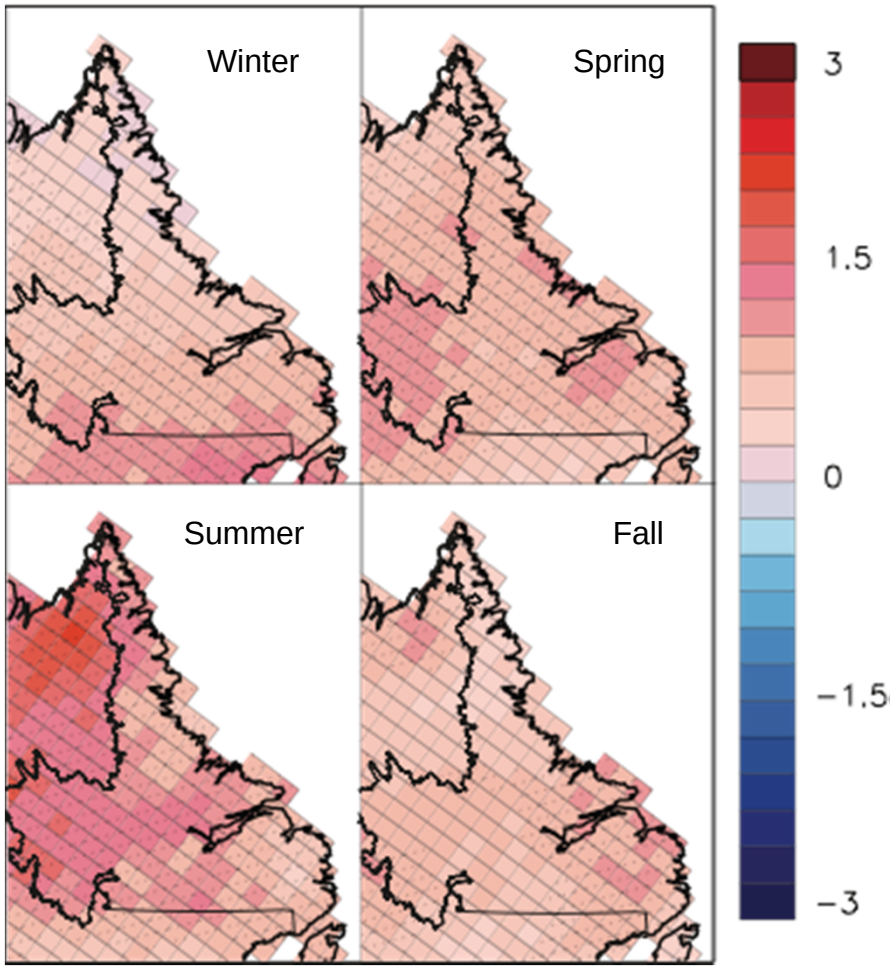
The number of precipitation events with 10 mm or more varies by location on the island. For example, St. John's currently sees 59 events while St. Anthony experiences 45 events.

By mid century, it is projected that the number of events will increase by about 3-4 per year.

Winter is expected to see more growth in these events than other seasons.

There will be more days with high levels of precipitation (10 mm or more)

Change in number of days with precipitation of 10 mm or more



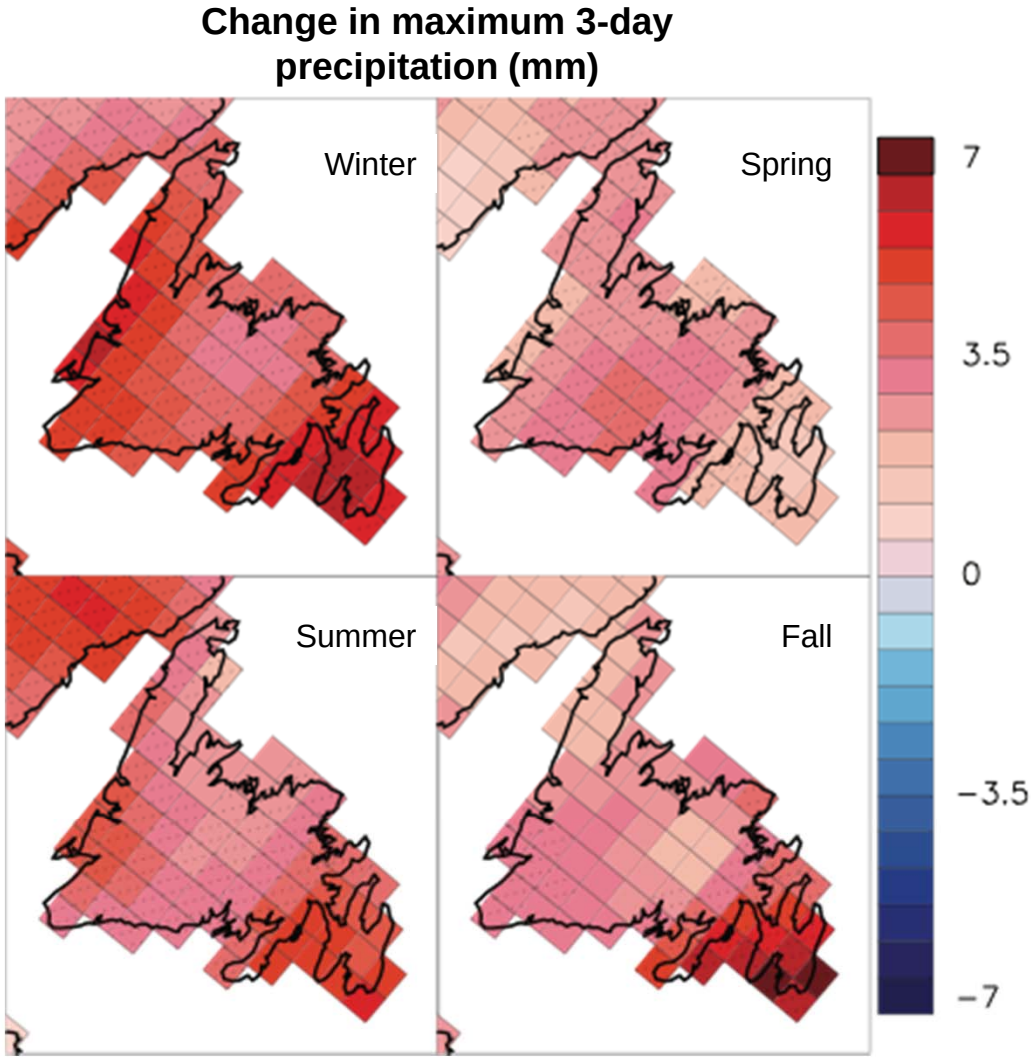
Higher levels of precipitation can lead to increased risk of flooding and erosion.

In Labrador, the number of precipitation events with 10 mm or more varies by location. For example, Cartwright currently sees 38 events while Wabush experiences 30 events.

By mid century, it is projected that the number of events will increase by about 3 to 4 per year.

Summer is expected to see more growth in these events than other seasons.

Maximum precipitation over a 3-day period is expected to increase in all seasons



High levels of precipitation over several days impacts reservoirs, soil-moisture capacity and water bodies, even if precipitation intensity is low.

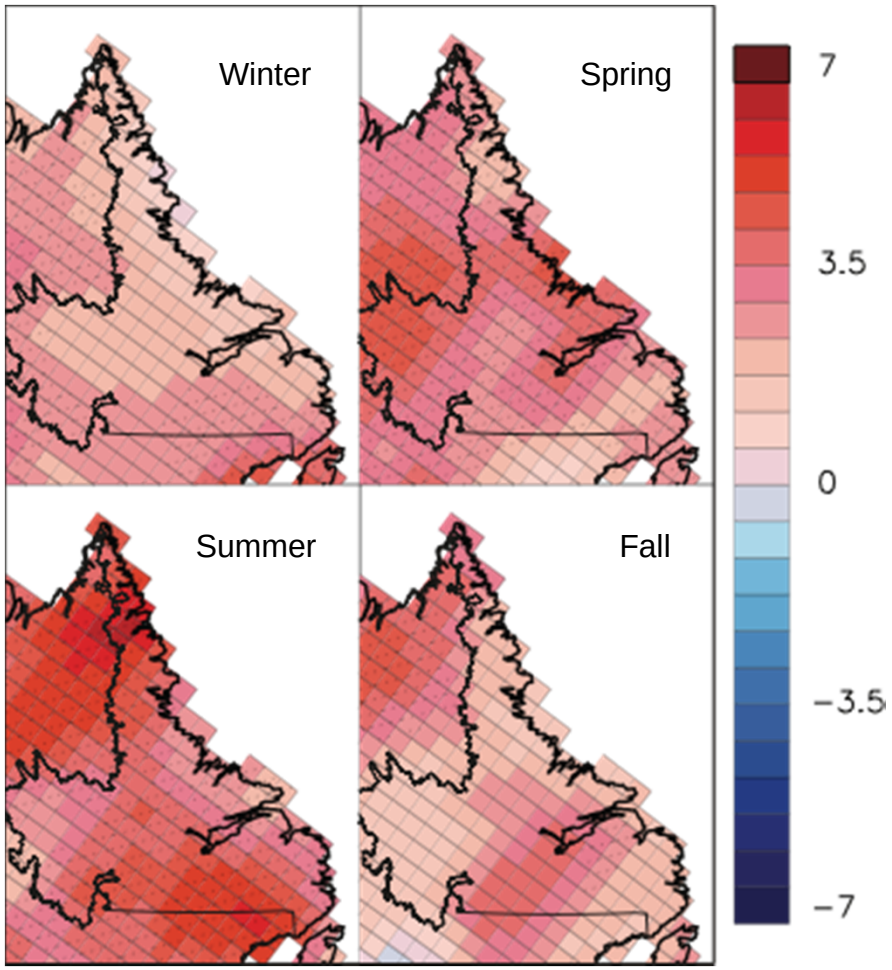
The Avalon Peninsula is expected to see the most increase in precipitation over 3 days during the summer, fall and winter seasons.

The west and south coasts are also expected to see growth in 3 day precipitation during all seasons.

Similar trends exist for 5-day and 10-day precipitation.

Maximum precipitation over a 3-day period is expected to increase in all seasons

Change in maximum 3-day precipitation (mm)



High levels of precipitation over several days impacts reservoirs, soil-moisture capacity and water bodies, even if precipitation intensity is low.

In Labrador, the largest increase in 3 day precipitation is expected to occur during the summer months and, to some extent, during the spring.

There is expected to be relatively little change during the fall and winter months.

Similar trends exist for 5-day and 10-day precipitation.

Other changes will be observed but with less significance

- **“Cooling degree days” are expected to increase during the summer, but the change is expected to be small**
  - This measure reflects the demand for energy to cool a building, calculated as the difference between mean temperature and 16ºC for those days where the mean temperature is higher than 16ºC
- **No significant increase in the incidence of heat waves**
  - Heat waves are defined as events of 6 or more days with a maximum temperature of 5ºC above normal
- **Droughts are not a concern for the province**
  - The maximum number of days between precipitation event and the average dry spell is not expected to change by any noticeable amount.
  - Droughts are measured as the longest stretch of days without precipitation

4. Implications: Temperature and Precipitation

All sectors and all regions of the province will be affected

- **Eight examples are provided to show potential implications, using different locations from around the province, as follows:**

Theme	Location
Infrastructure	St. John's
Coastal erosion	Stephenville
Agriculture and forestry productivity	Grand Falls-Windsor
Energy demand in an isolated community	Nain
Winter tourism	Gander and Corner Brook
Aquaculture	Bay d'Espoir
Aquatic invasive species	Bay d'Espoir
Geographic Range and Incidence of Human Diseases	Deer Lake to St. Anthony

Example #1:
Impacts on transportation infrastructure from higher levels of precipitation

Location	Season	Late 20th century	Change to mid 21st century	Uncertainty estimate
		Maximum 3-day precipitation (mm)		
St. John's	Spring	76.2	+ 1.6	+/- 1.7
	Summer	58.9	+ 4.5	+/- 6.2
	Fall	75.0	+ 5.8	+/- 3.9
	Winter	86.8	+ 5.8	+/- 4.3

- **Maximum potential rainfall over 3 days in St. John's is expected to increase by 7% to 8%**
- **There is the potential for more flooding from higher rainfall, and the potential for higher amounts of snowfall from winter storms**
- **This could have implications on transportation infrastructure planning (e.g., culvert size, snow clearing equipment)**

Example #2:
Coastal erosion resulting from stronger storms

Location	Season	Late 20th century	Change to mid 21st century	Uncertainty estimate
		Number of precipitation events > 10 mm		
Stephenville	Spring	8.8	+ 1.0	+/- 0.7
	Summer	10.9	+ 0.9	+/- 0.6
	Fall	13.5	+ 0.5	+/- 0.7
	Winter	14.1	+ 1.6	+/- 0.7

- **The Stephenville area is susceptible to coastal erosion**
- **The rate of coastal erosion is impacted by storm frequency and intensity**
- **Number of precipitation events with 10+ mm per year expected to increase from 47.3 to 51.3 by mid century**
- **When combined with higher levels of precipitation per event, there is the potential for higher rates of coastal erosion in the area**

Example #3:
Agriculture and forestry productivity will improve, but also bring invasive species and pests

Location	Season	Late 20th century	Change to mid 21st century	Uncertainty estimate
		Number of growing degree days		
Grand Falls-Windsor	Spring	23.8	+ 10.1	+/- 7.5
	Summer	534.7	+ 145.2	+/- 50.6
	Fall	98.5	+ 39.1	+/- 19.0

- **Growing degree days correlates to the amount of heat available for industries such as forestry and agriculture**
- **In Grand Falls-Windsor, the number of growing degree days will increase by about 30% by mid century**
- **This will mean longer and more productive agriculture and forestry seasons, and a shift in vegetation types**
- **It may also mean a later start to the big game hunting season, the presence of new species, and increases in pests (e.g., spanworm)**

Example #4:
Reduced demand for energy in an isolated community

Location	Season	Late 20th century	Change to mid 21st century	Uncertainty estimate
		Number of heating degree days		
Nain	Fall	1315.8	- 199.4	+/- 69.5
	Winter	2856.2	- 356.8	+/- 125.3
	Spring	1925.5	- 203.4	+/- 56.3

- **Heating degree days correlates to the amount of heat available necessary to heat buildings in cold weather**
- **In Nain, the number of heating degree days is expected to decrease by about 12% by mid century**
- **This will mean that homeowners and commercial building owners will require less energy to heat buildings (heating oil, wood, electricity)**

Example #5:
The winter tourism season may shorten

Location	Season	Late 20th century	Change to mid 21st century	Uncertainty estimate
		° Celsius		
Gander	Winter	- 5.55	+ 2.69	+/- 1.30
Corner Brook	Winter	- 4.89	+ 2.84	+/- 1.29

- **The average winter temperature in Gander and Corner Brook is expected to be at least 2.7ºC warmer by mid century**
- **Warmer winters will reduce the period of snow cover, potentially shortening snowmobile and skiing seasons**
- **However, due to increased temperatures, this may also mean that the summer tourism season may start earlier and extend later into the fall months**

Example #6:
Warmer temperatures may increase aquaculture productivity but also bring risks to fish health

Location	Season	Late 20th century	Change to mid 21st century	Uncertainty estimate
		º Celsius		
Bay d'Espoir	Spring	2.63	+ 2.12	+/- 0.33
	Summer	14.92	+ 2.04	+/- 0.36
	Fall	7.32	+ 2.01	+/- 0.51

- **The average temperature from spring to fall at Bay d'Espoir is expected to grow by over 2ºC by mid century**
- **Warmer temperatures could result in warmer coastal waters resulting in improved aquaculture productivity in the early spring and early summer**
- **However, during later summer and the fall warmer coastal waters may result in decreased aquaculture productivity**
- **Warmer temperatures could also result in the increased detection of infectious pathogens and diseases harmful to fish health**

Example #7:
Warmer temperatures may increase the introduction and spread of aquatic invasive

Location	Season	Late 20th century	Change to mid 21st century	Uncertainty estimate
		° Celsius		
Bay d'Espoir	Spring	2.63	+ 2.12	+/- 0.33
	Summer	14.92	+ 2.04	+/- 0.36
	Fall	7.32	+ 2.01	+/- 0.51

- **The south coast of the island is a high marine traffic area and a known area of aquatic invasive species (AIS) in Newfoundland & Labrador**
- **Potentially warmer coastal waters may allow improved conditions for the survival and reproduction of AIS (e.g. tunicate species)**
- **AIS can potentially change the structure and function of aquatic ecosystems and/or negatively affect the fishing and aquaculture industry**

Example #8:
Rising temperatures may increase the incidence of human illness from infectious diseases

Location	Season	Late 20th century	Change to mid 21st century	Uncertainty estimate
		° Celsius		
Deer Lake	Summer	14.98	+ 2.10	+/- 0.41
Daniel's Harbour		13.18	+ 2.16	+/- 0.53
Plum Point		12.96	+ 2.13	+/- 0.58
St. Anthony		12.32	+ 1.91	+/- 0.60

- **The average summer temperature on the Northern Peninsula is expected to grow by about 1.9 to 2.2 ºC by mid century**
- **This may result in variations to patterns of diseases caused by bacteria, viruses and other pathogens carried by mosquitoes, ticks, and animals**
- **For example, the incidence of Lyme disease may increase as warmer temperatures expand the range of the species of ticks known to transmit the disease**

5. Key Findings and Implications: Extreme Precipitation Events

Defining Extreme Precipitation Events

- **Climate change will result in more intense extreme events**
- **Extreme precipitation events examine the frequency and intensity of precipitation events**
- ***For example, if the models project that 100 mm of rain will fall over a 24 hour period once every 100 years, this means that there is a reasonable probability that a storm with 100 mm of rain will occur once every 100 years***
- **These projections are used for infrastructure design (roads, drainage system, etc.)**

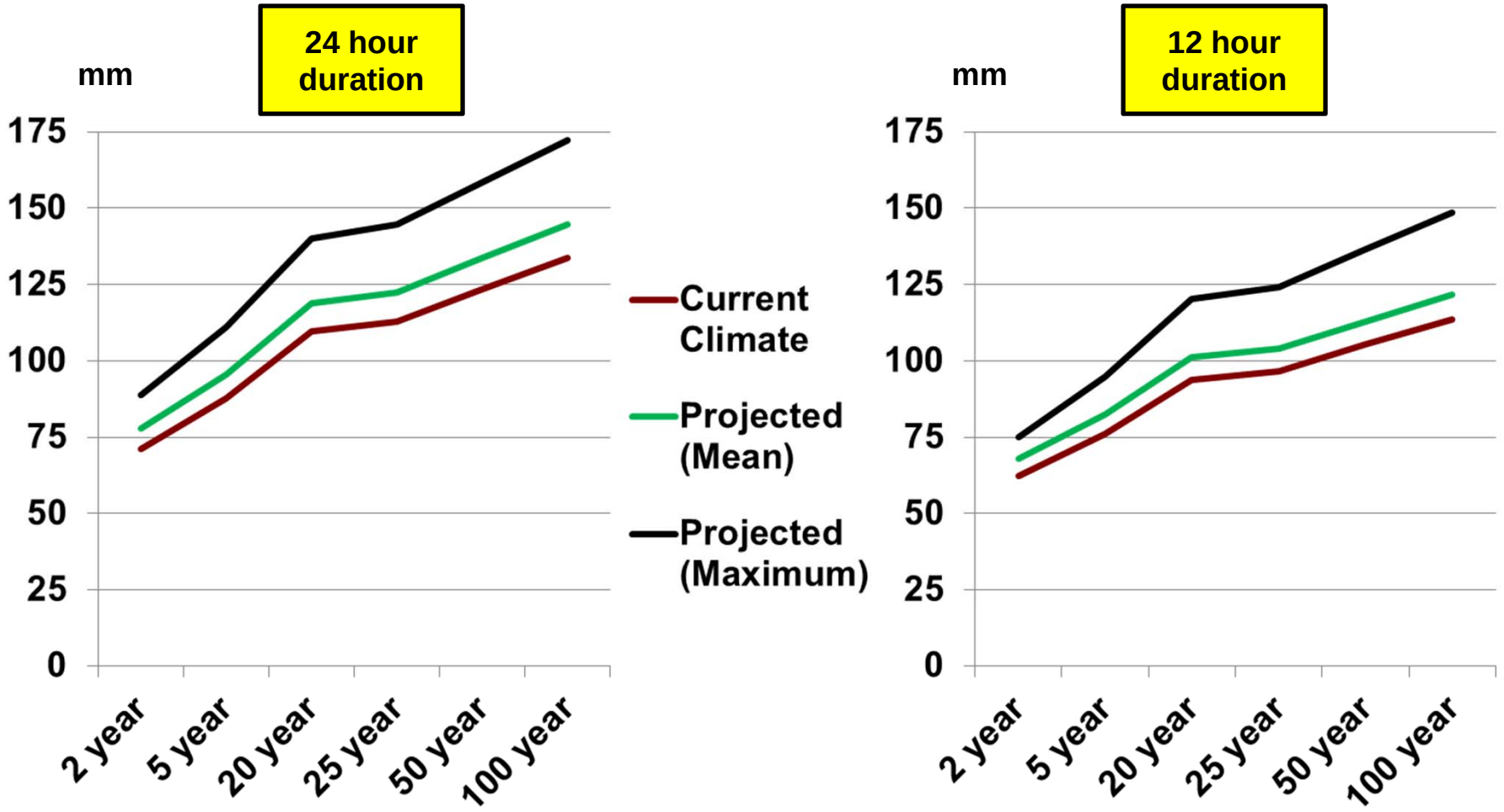
What are the main findings from projections of extreme precipitation?

- **Extreme precipitation events will increase for all locations**
- **In most cases**
  - **1-in-100 year storms are projected to become 1-in-50 or 1-in-25 year storms**
  - **1-in-50 year storms are projected to become 1-in-25 or 1-in-20 year storms**
  - **1-in-20 year storms are projected to become 1-in-5 or 1-in-2 year storms**
- **Newfoundland is expected to get more intense events than Labrador**

19 locations are included in this study

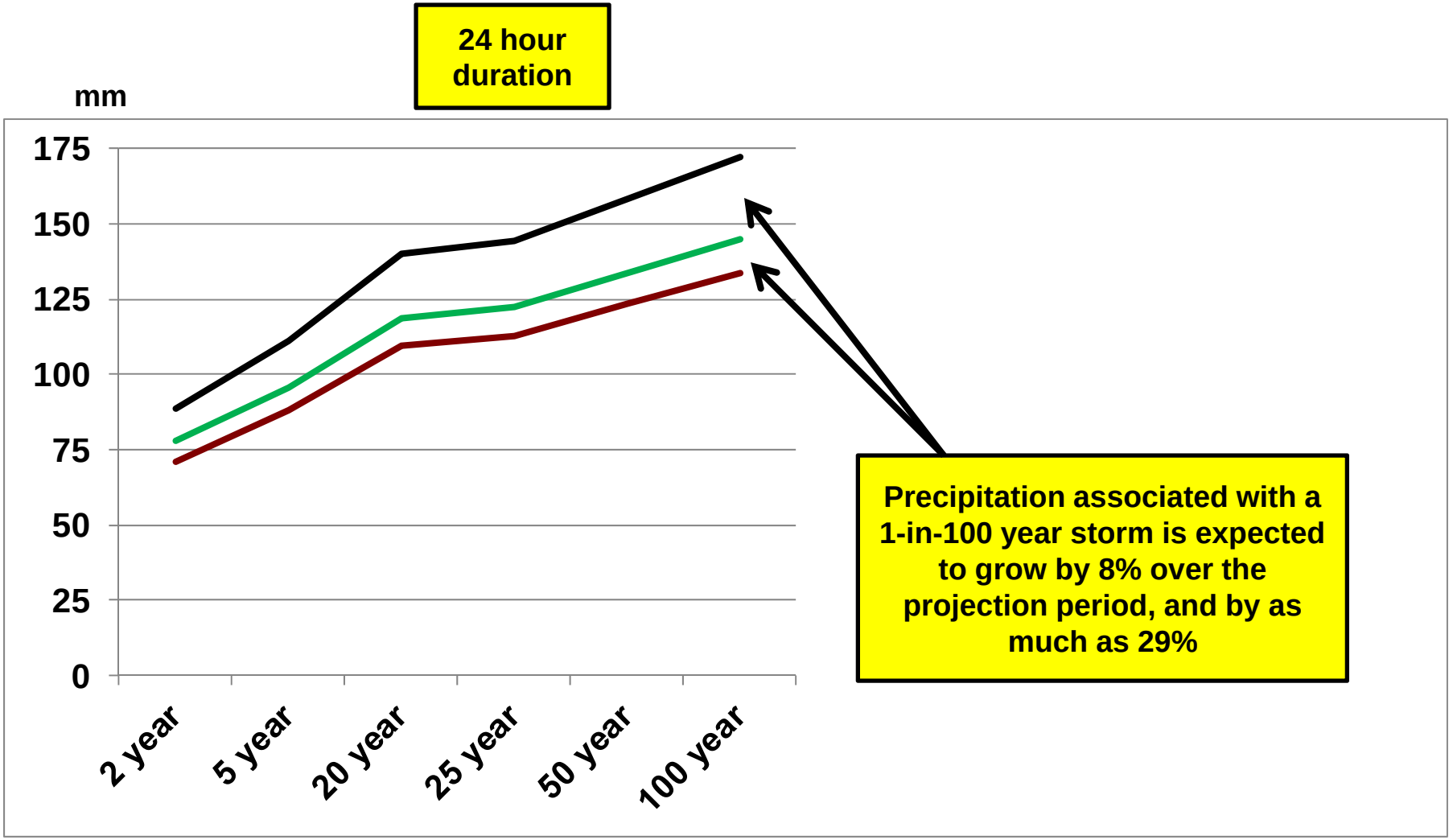
- **First example (St. Lawrence) includes details on how to use the information**
- **Charts for the all locations are located in the Annex to this presentation**
- **Data for all locations is available at www.turnbackthetide.ca**

Extreme Weather Precipitation
St. Lawrence



Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

How to use this information
Extreme Weather Precipitation – St. Lawrence



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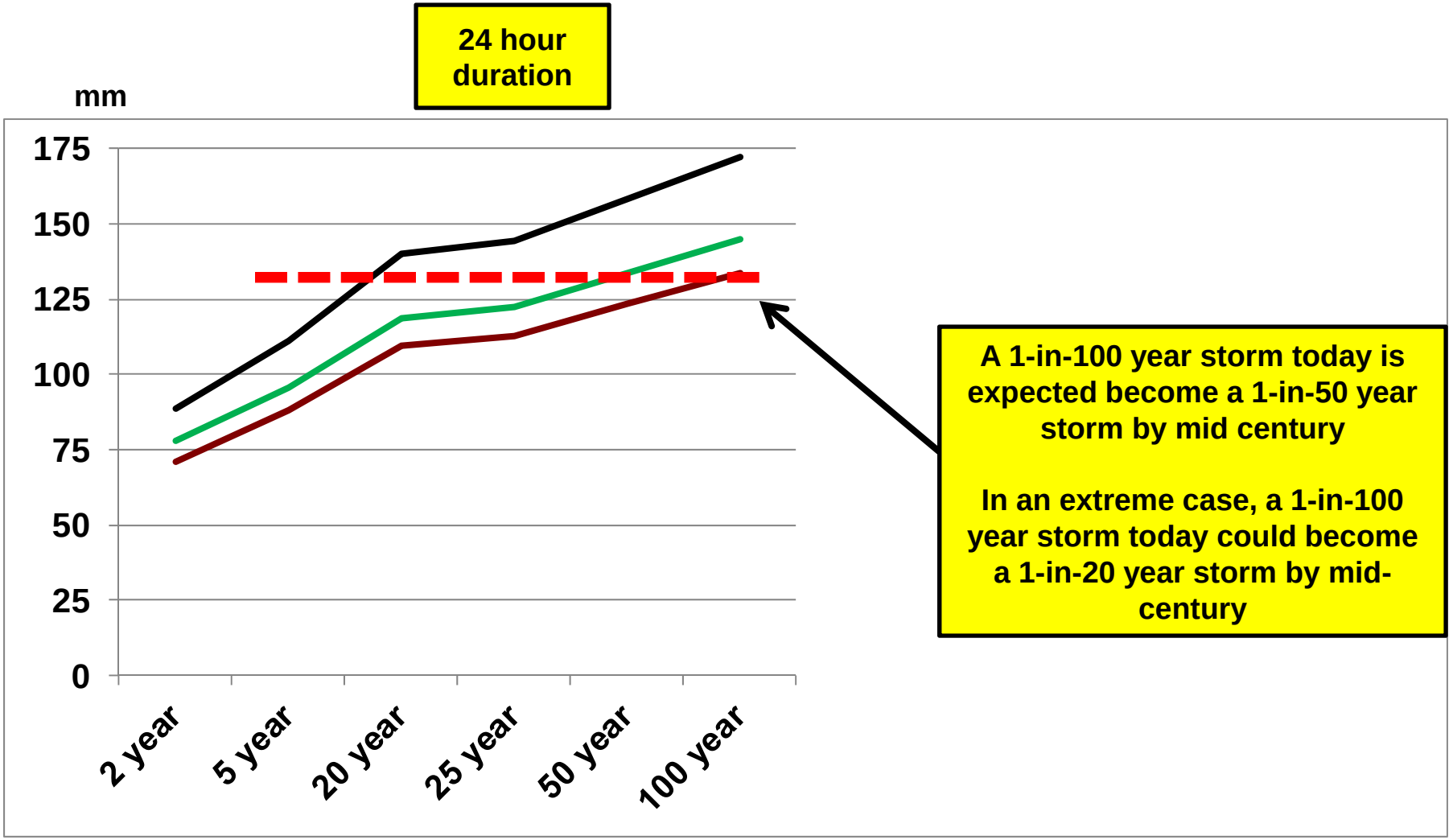
How to use this information
Extreme Weather Precipitation – St. Lawrence



Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Example #9:
Planning for extreme weather events

Period	St. Lawrence	2 year	5 Year	20 Year	25 year	50 year	100 year
		mm					
24 hours	Current	71.2	87.9	109.6	113.0	123.4	133.7
	Projected mean	77.8	95.7	118.9	122.5	133.7	144.7
12 hours	Current	62.3	76.1	93.9	96.7	105.3	113.7
	Projected mean	68.1	82.5	101.1	104.0	113.0	121.8

- **For 1-in-2 and 1-in-5 year storms, precipitation is expected to increase by about 9% in St. Lawrence**
- **Currently, a 1-in-100 year storm is expected to bring 133.7 mm of precipitation over a 24 hour period – by mid century, a 1-in-50 year storm is expected to bring this level of precipitation**
- **These changes may impact on future municipal zoning regulations, and may result in increased culvert sizes on municipal roads**

6. Key Conclusions

Conclusions

- **Climate change is happening**
- **Projections show that temperatures are rising, precipitation is increasing and extreme weather events are becoming more intense**
- **Changes to our climate will affect all sectors, from agriculture, forestry and aquaculture, to infrastructure, health, and tourism.**
- **It is important that we improve our understanding of what we can expect to happen, so we can better plan for the future.**
- **Climate change projections can support better planning and decision-making by all levels of government, industry, businesses, communities and non-governmental organizations.**
- **This will allow for new opportunities to be identified and to increase resilience, thereby reducing risks and costs.**

7. Contact Information

Further Reading and Contact Information

- **Graphics published at http://maps.gov.nl.ca/water/**
- **Technical report published at www.turnbackthetide.ca**
- **Data for individual weather stations available in Excel format at www.turnbackthetide.ca**
- **For further information, please contact**

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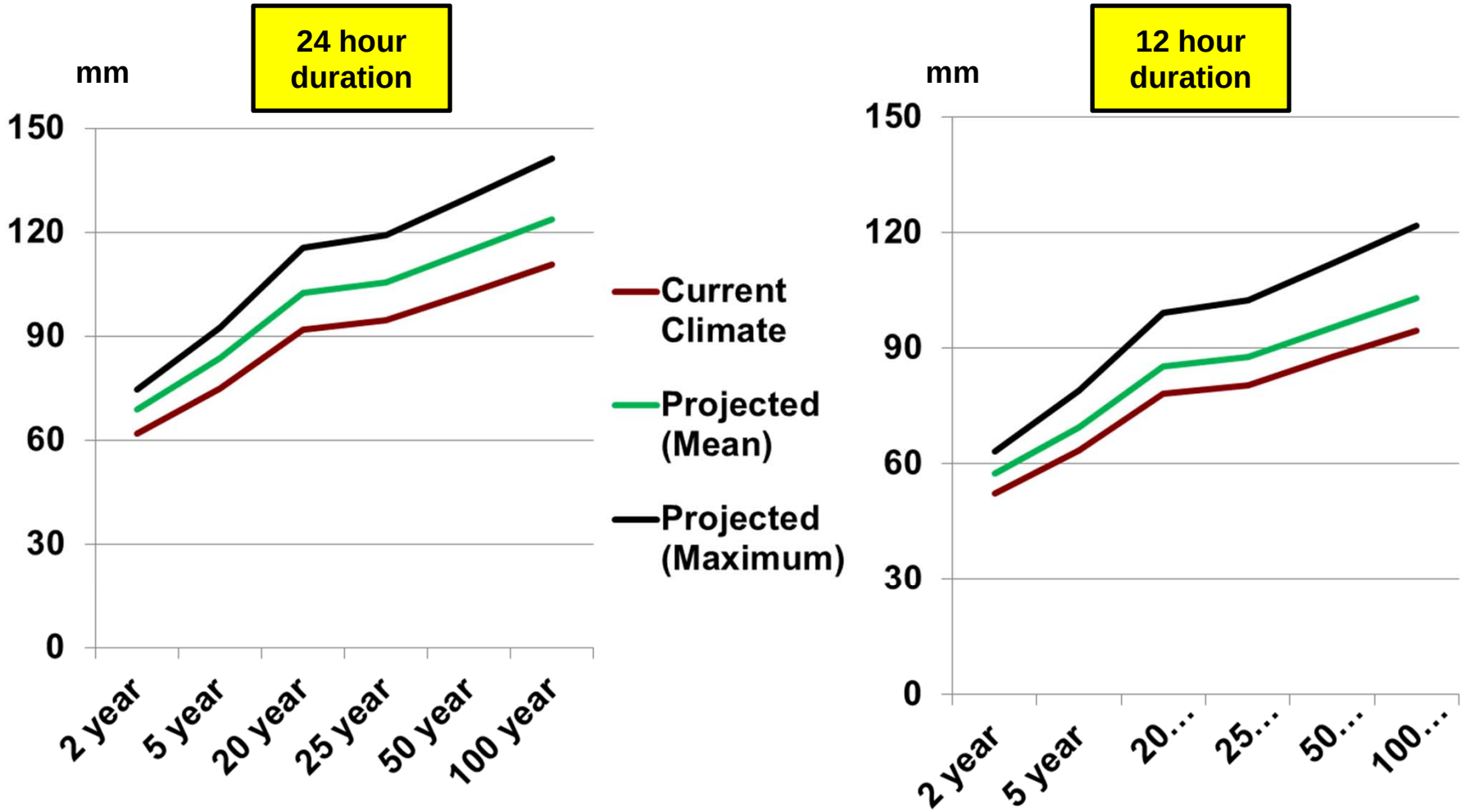
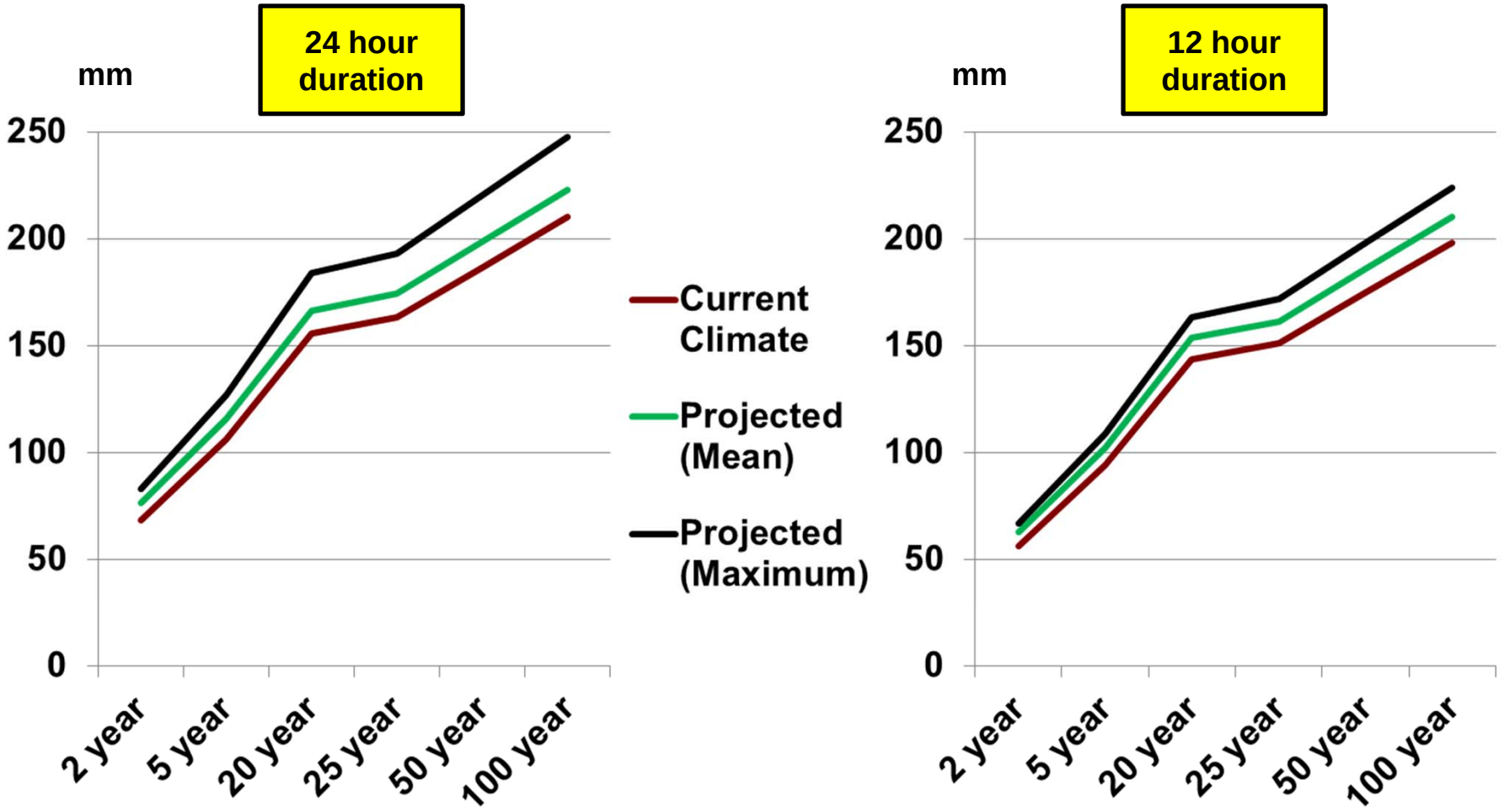
Annex – Extreme Precipitation Events (all locations)

Extreme Weather Precipitation
St. John's



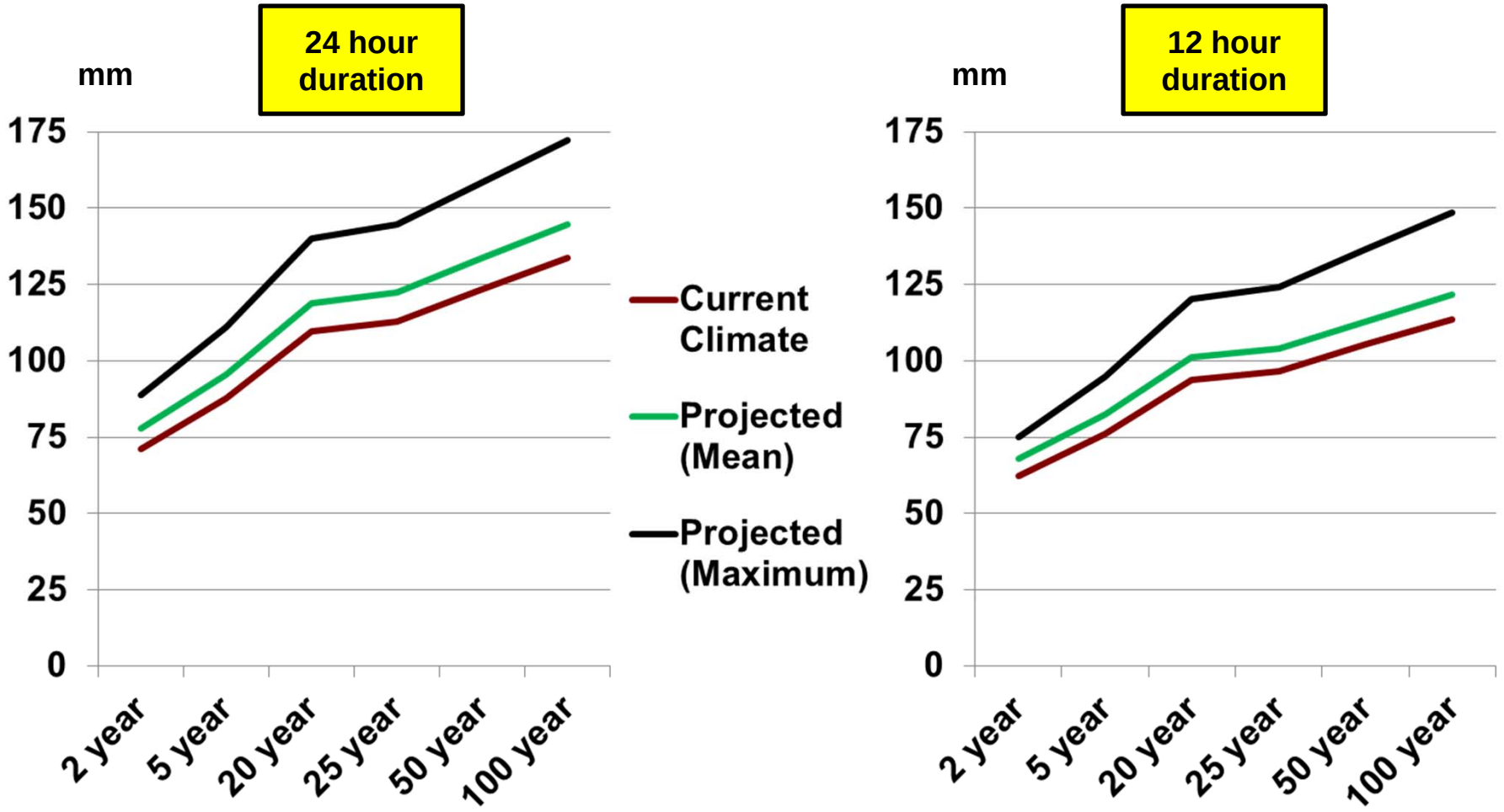
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation Argentia



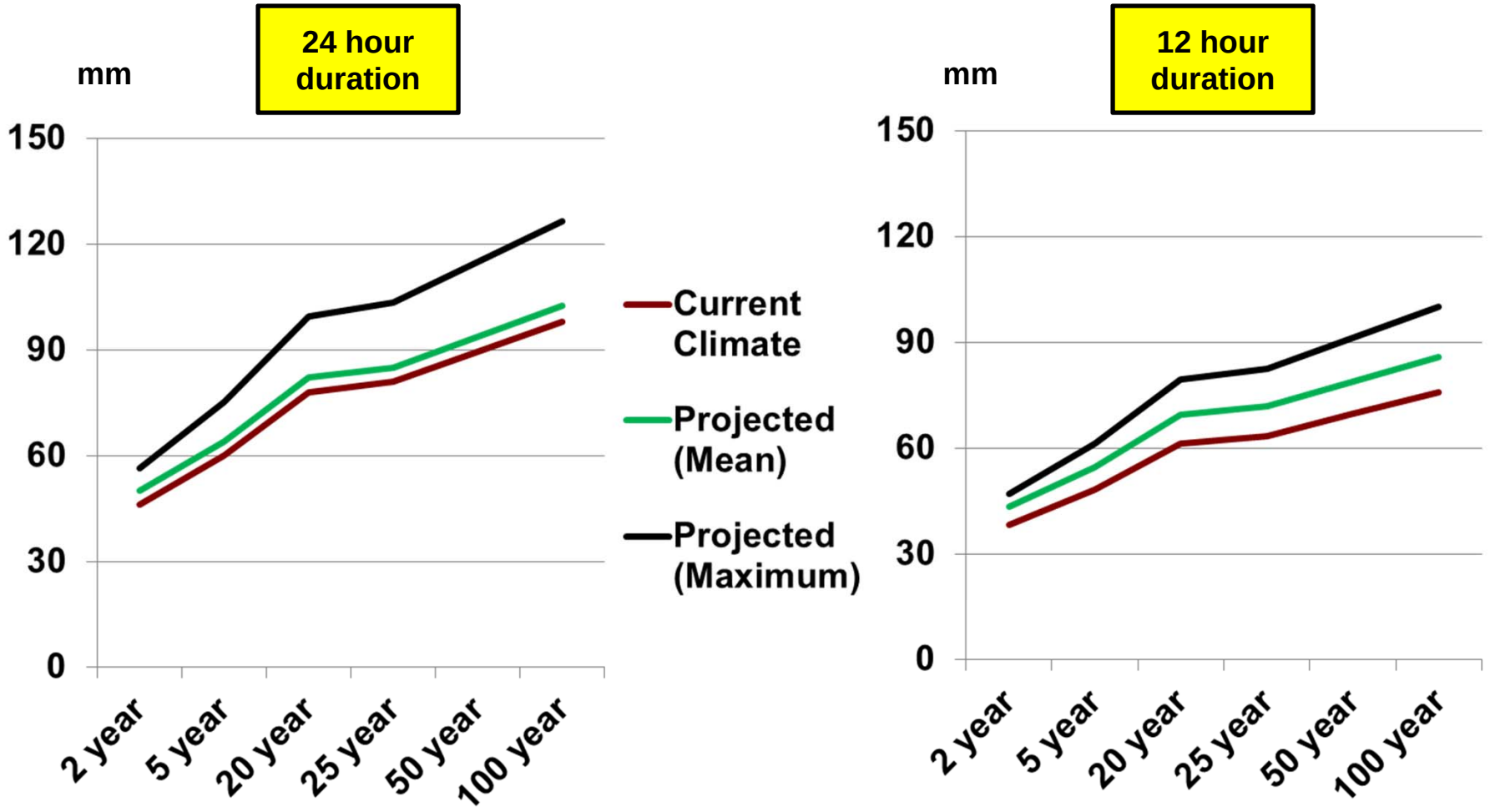
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
St. Lawrence



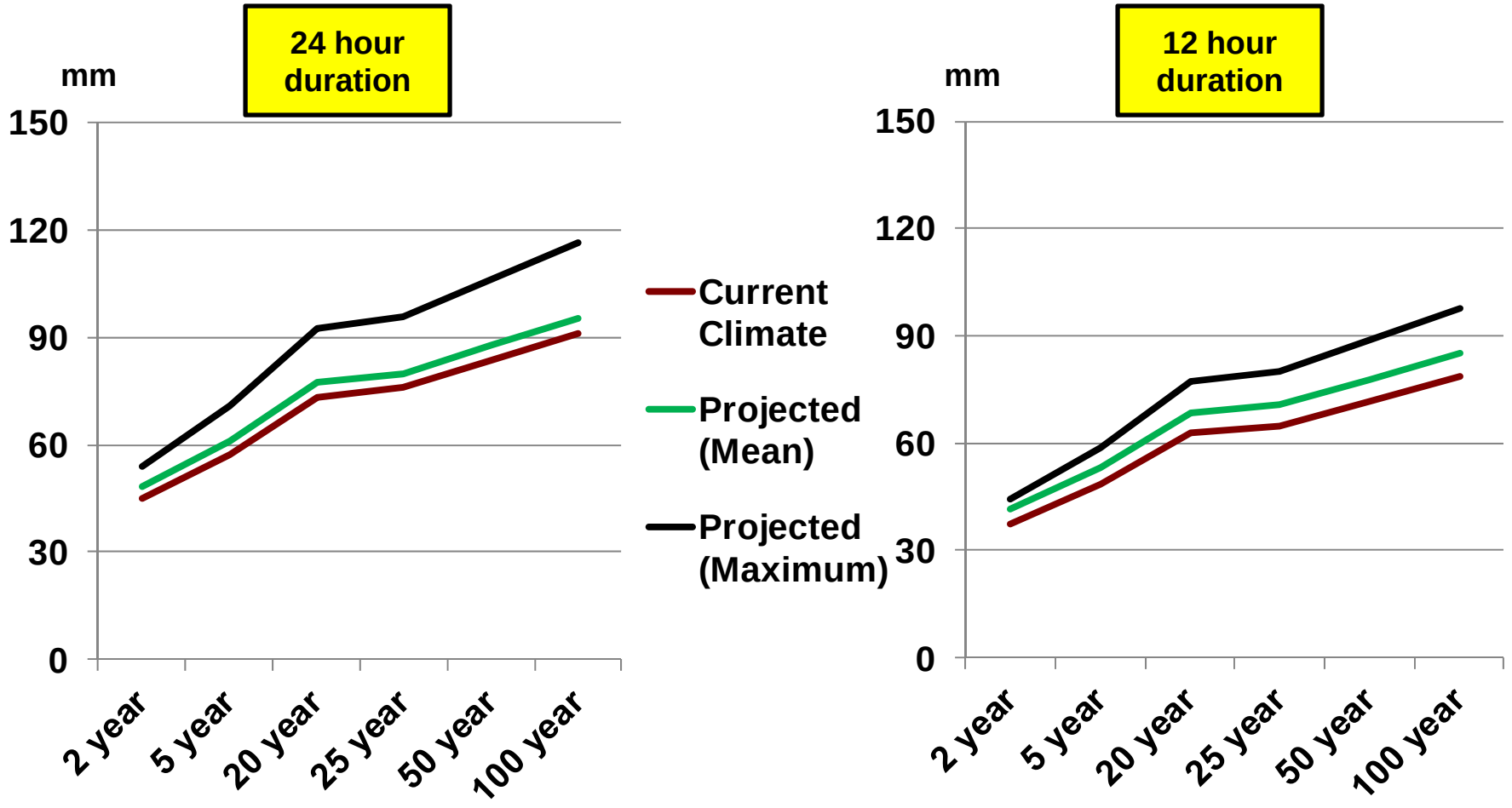
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
Gander



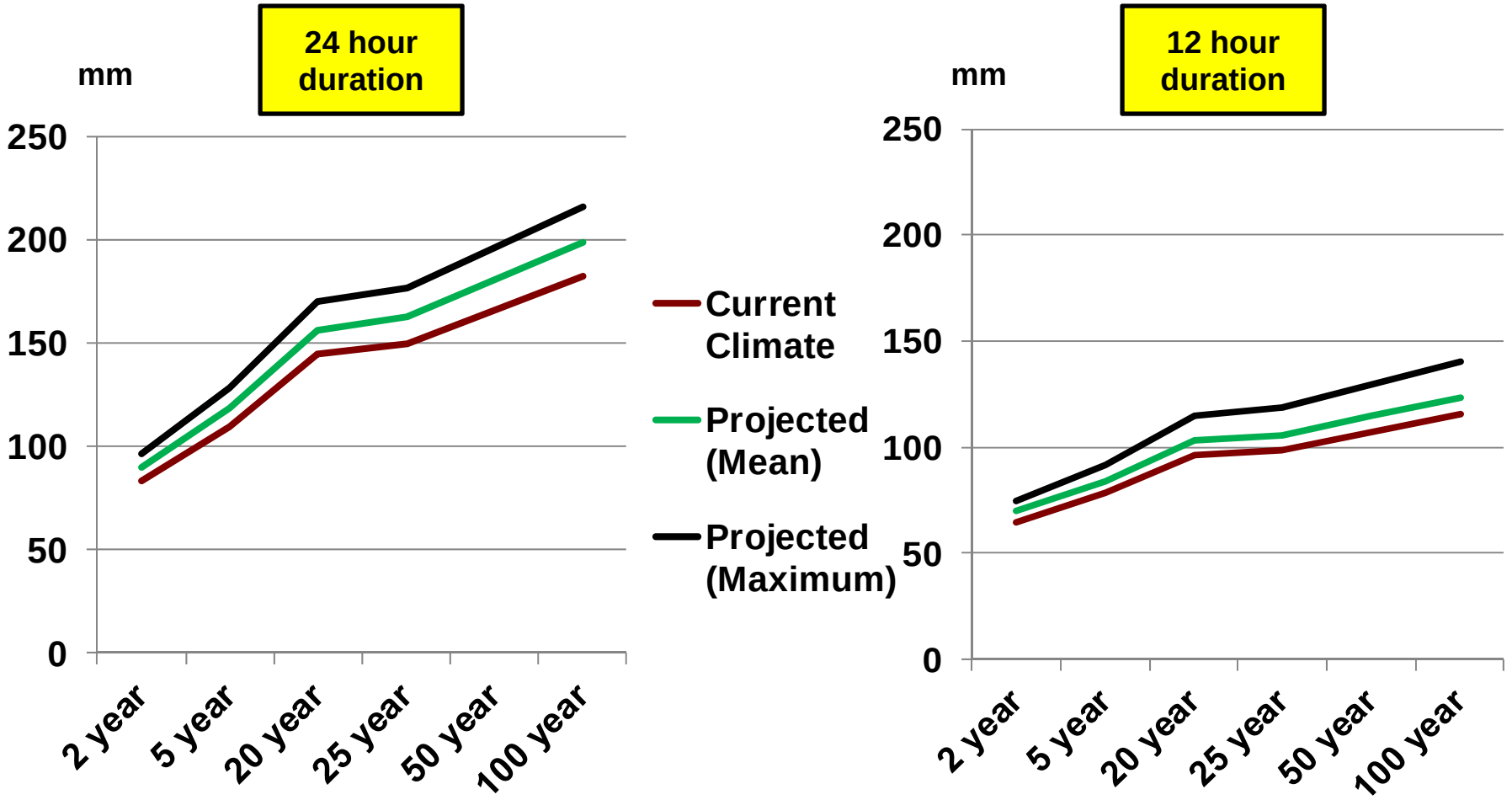
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
Comfort Cove



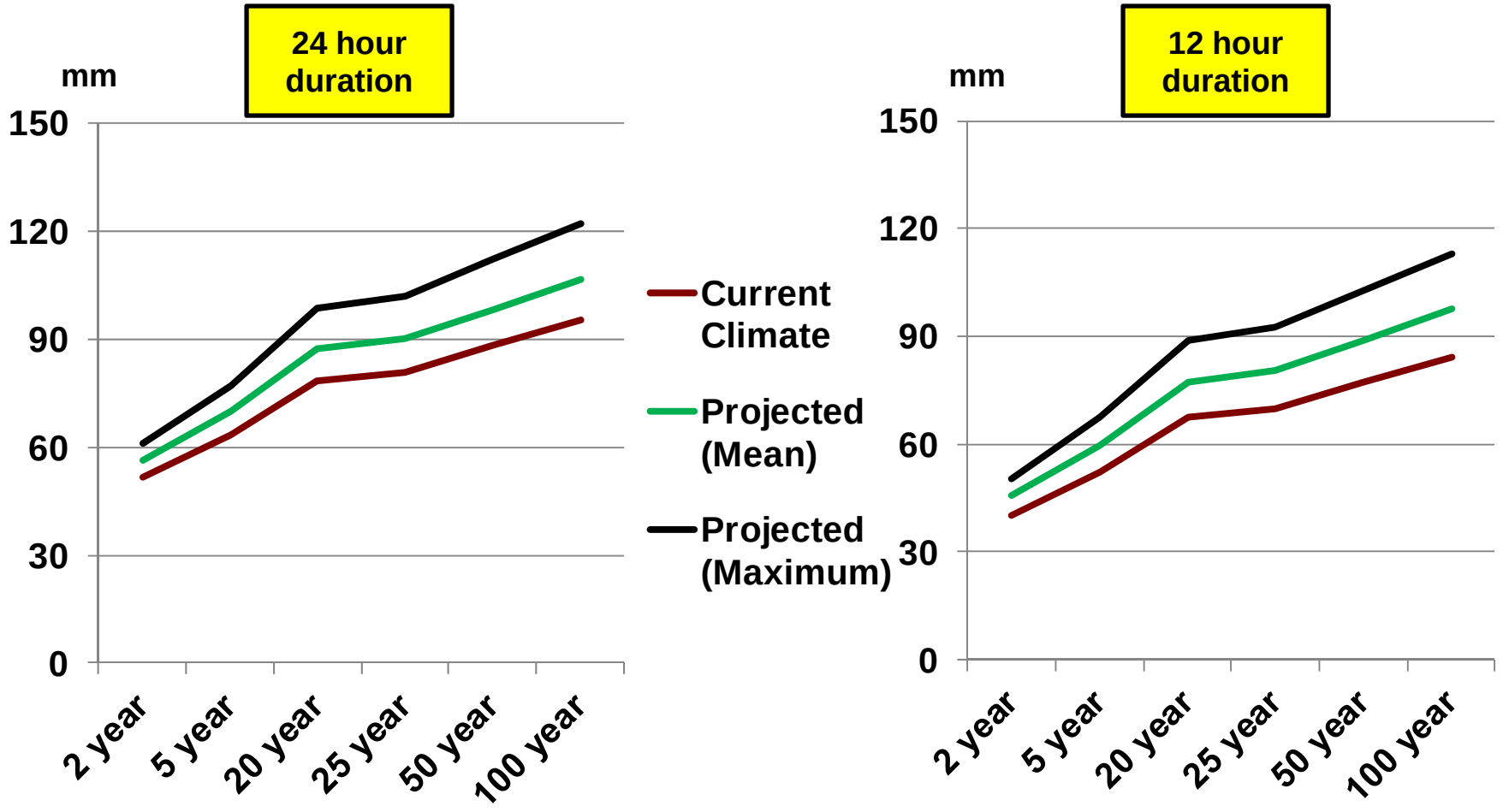
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
St. Alban's



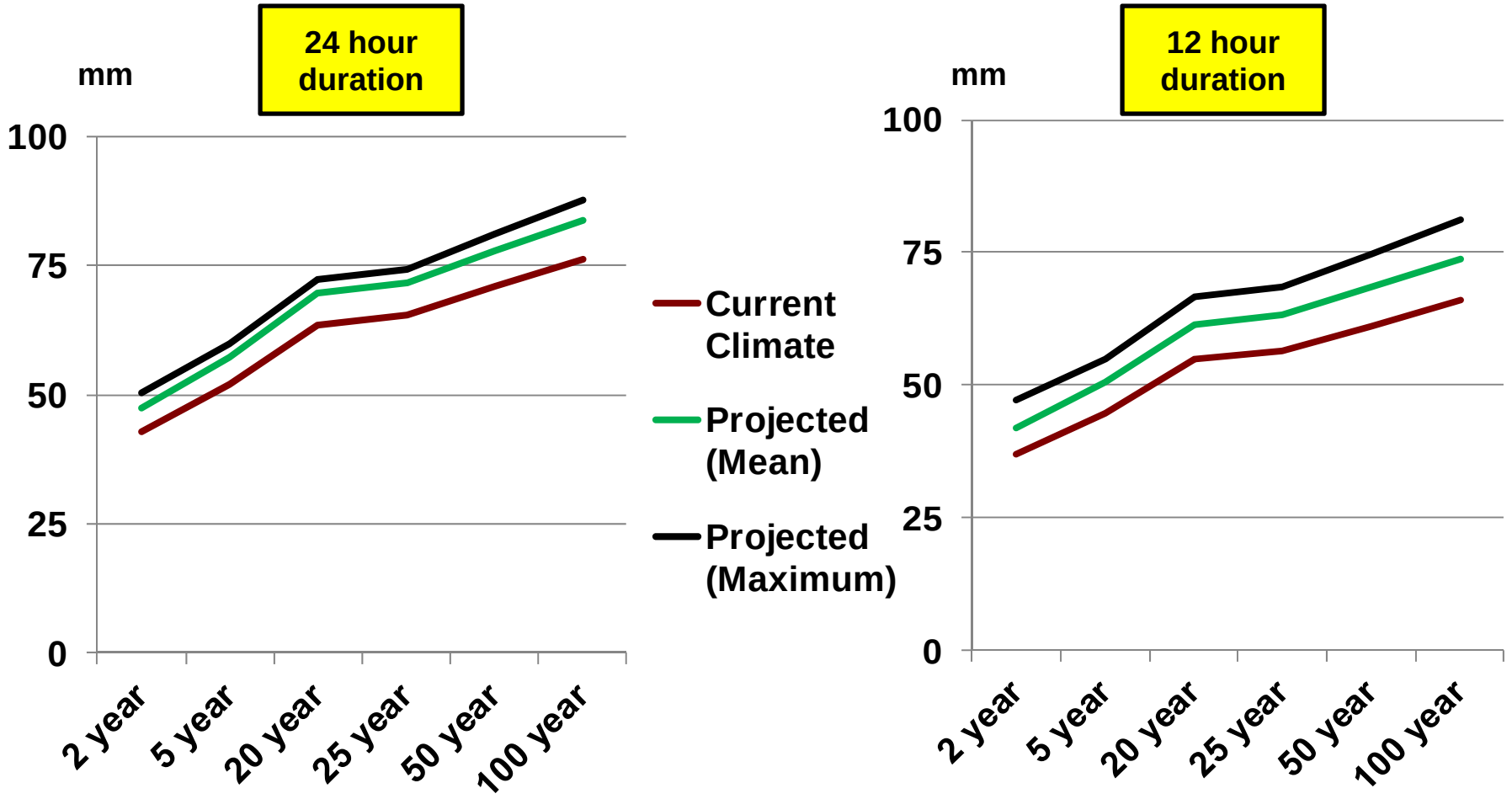
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
LaScie



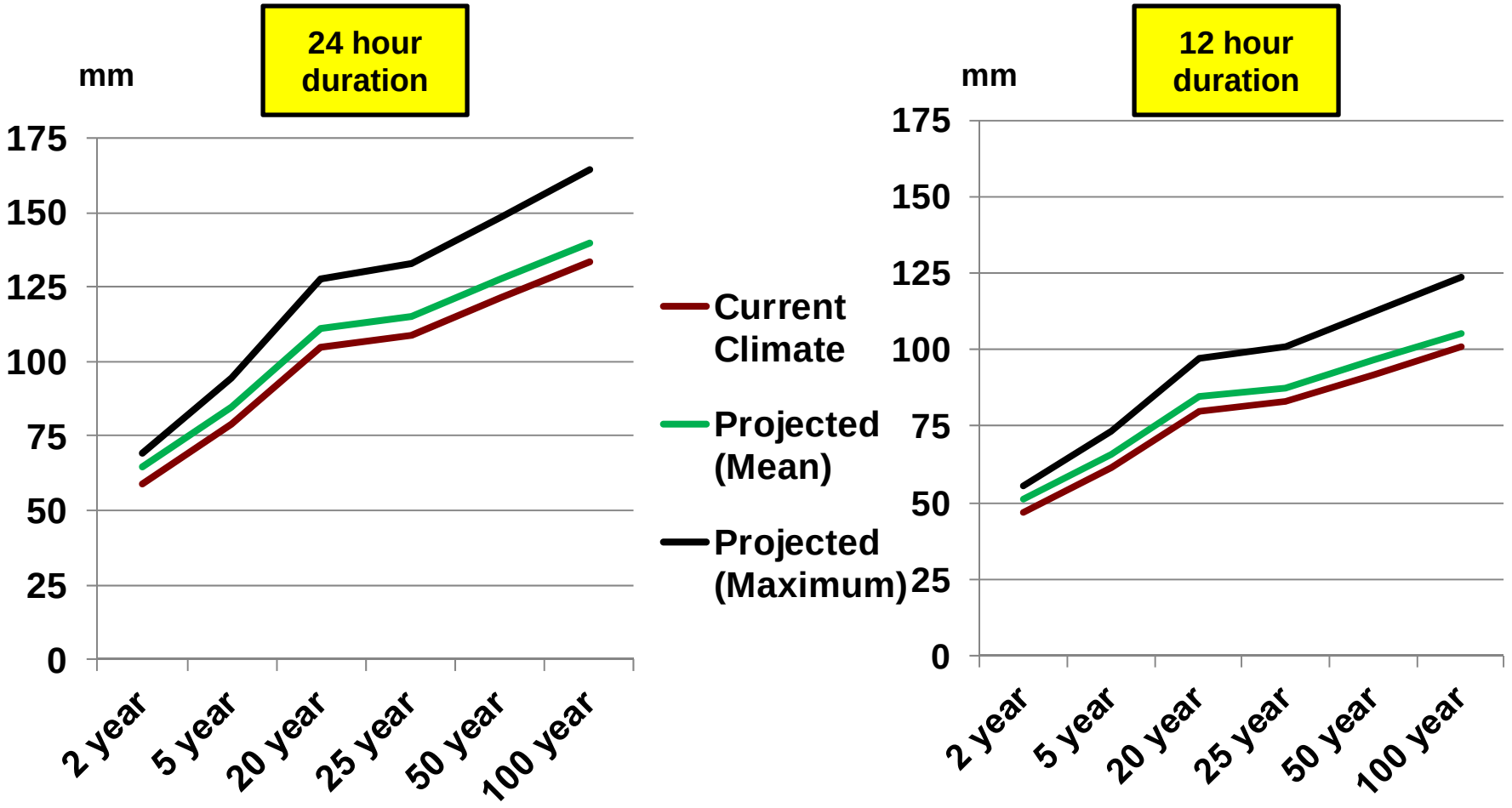
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
Deer Lake



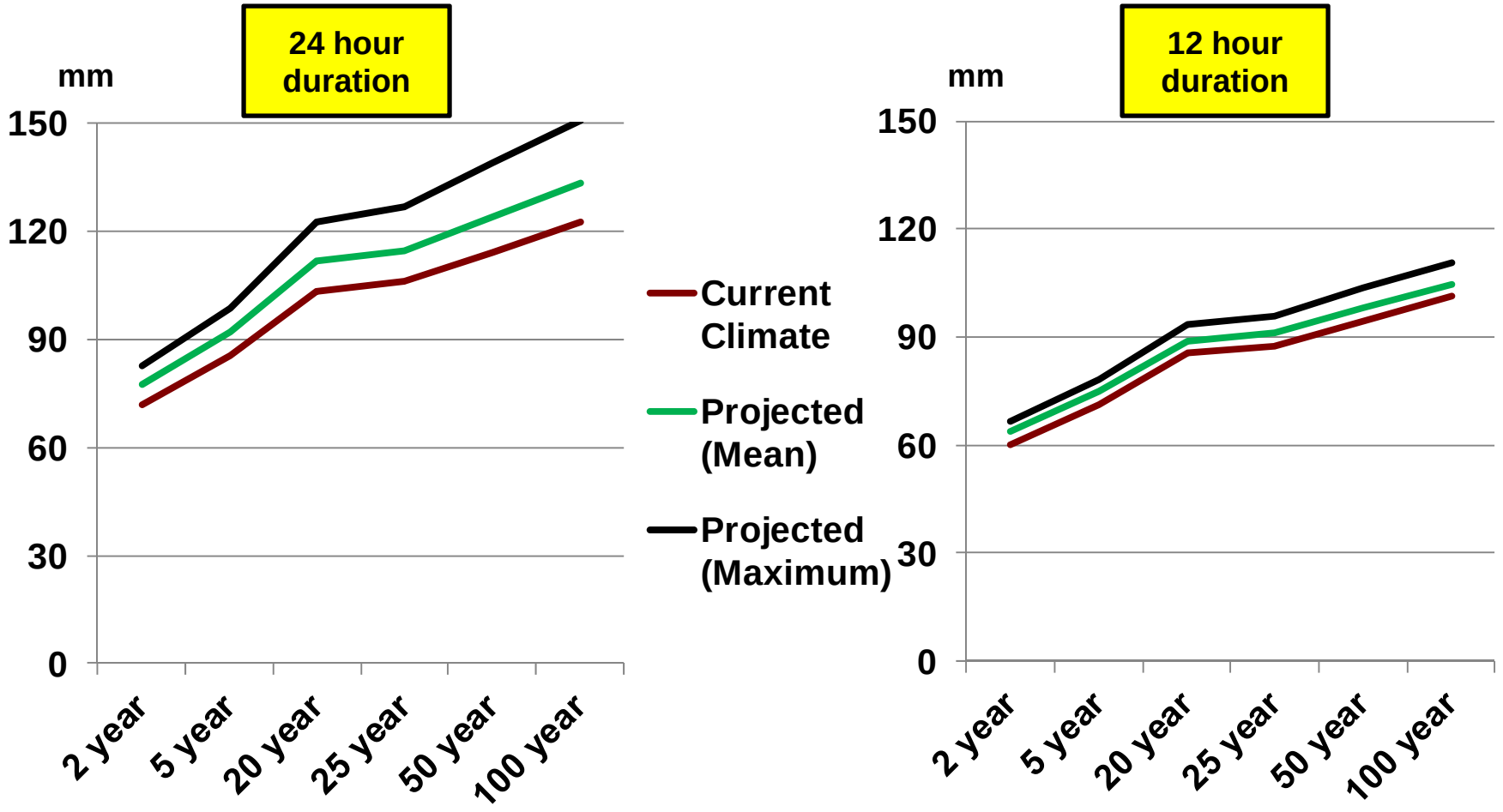
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
Stephenville



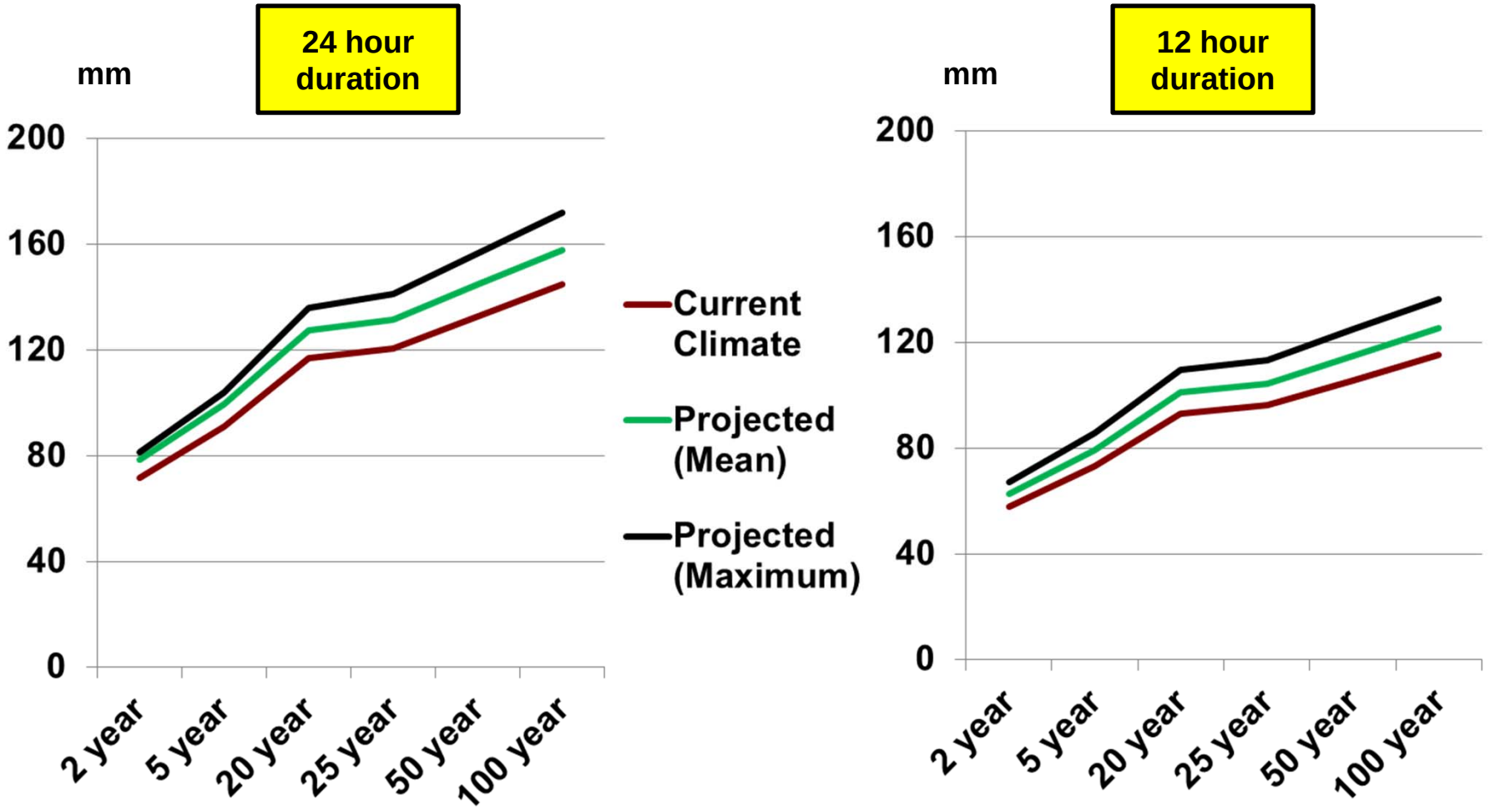
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
Burgeo



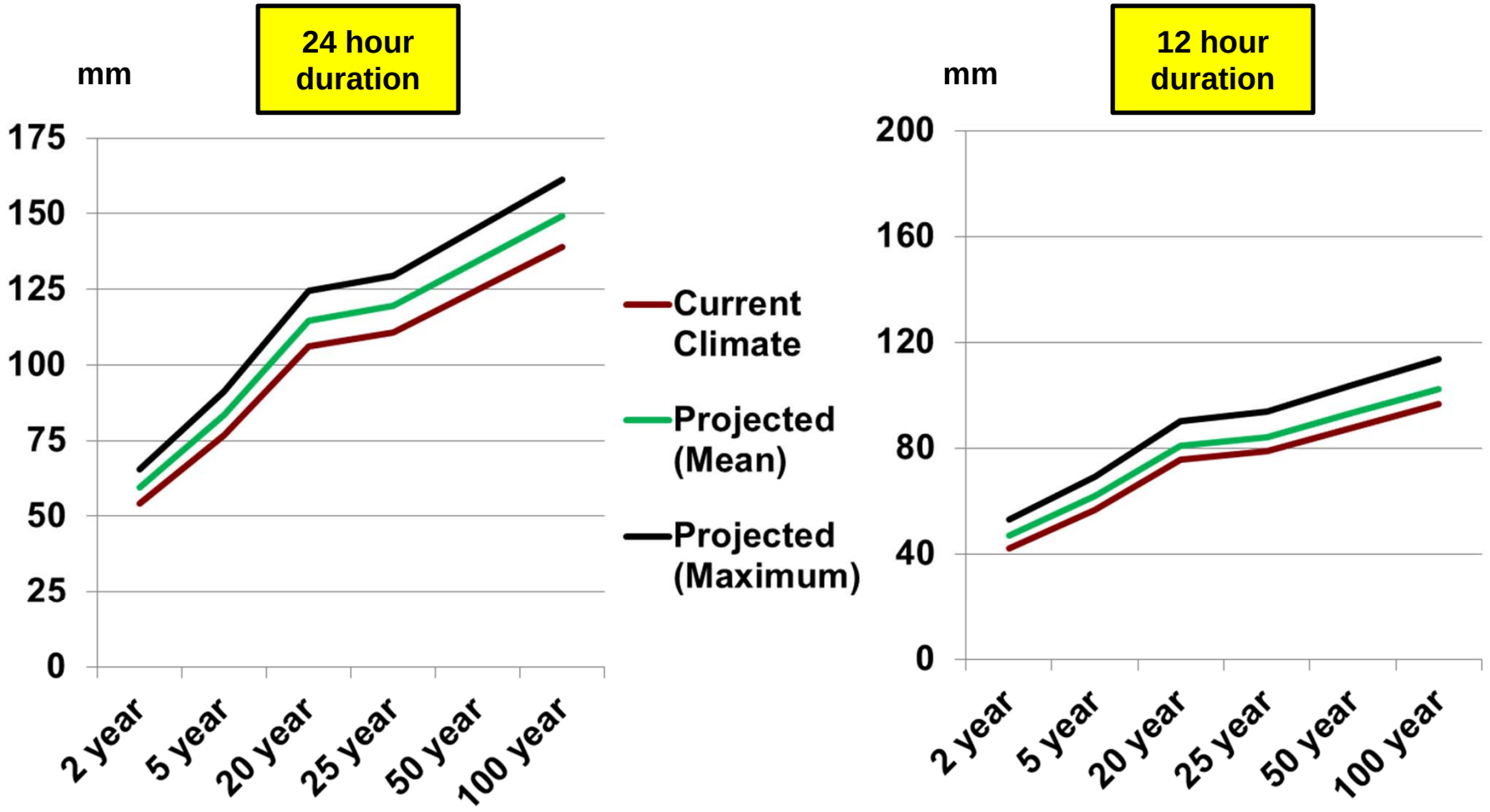
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
Port aux Basques



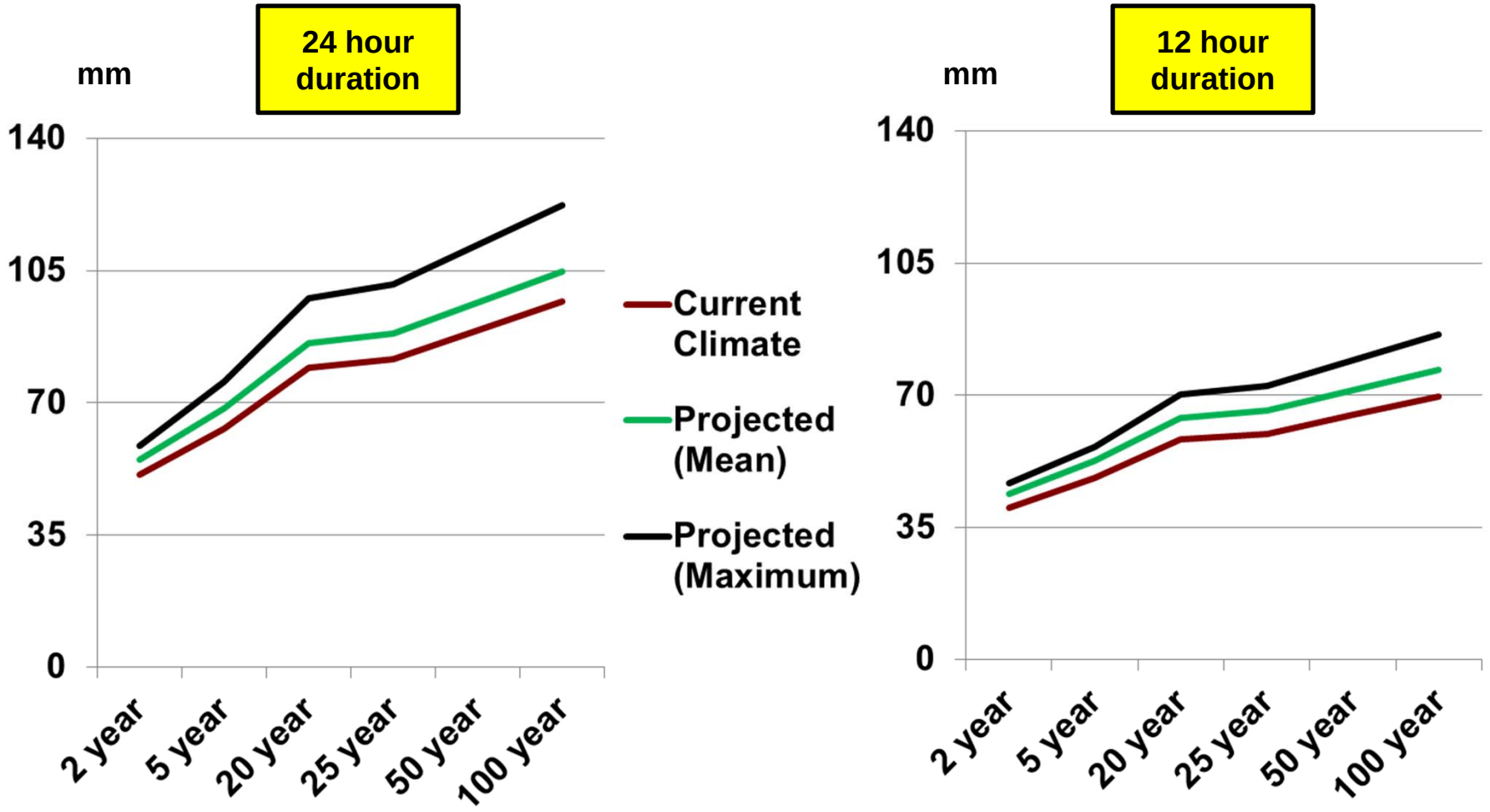
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
Daniel's Harbour



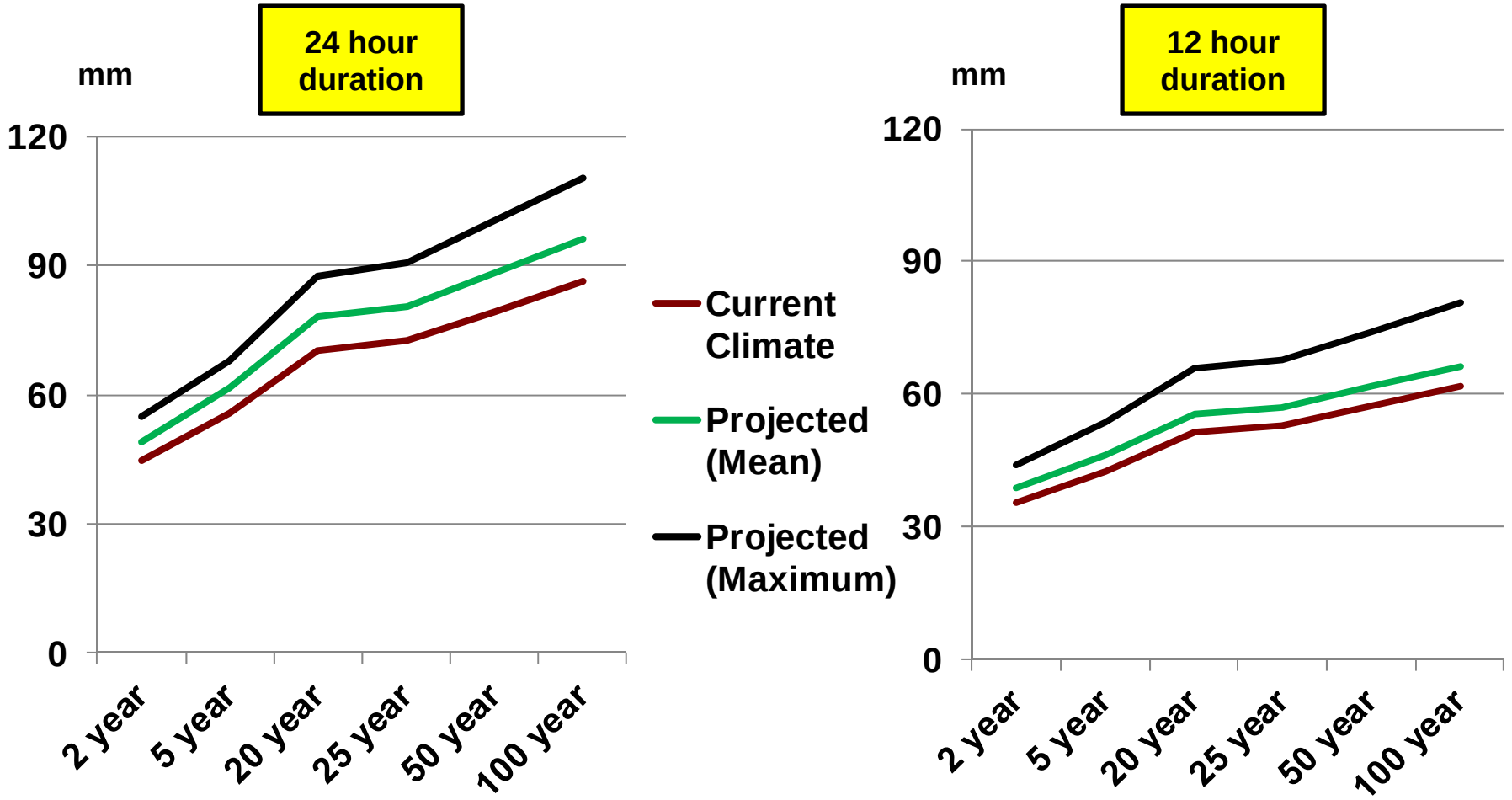
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
St. Anthony



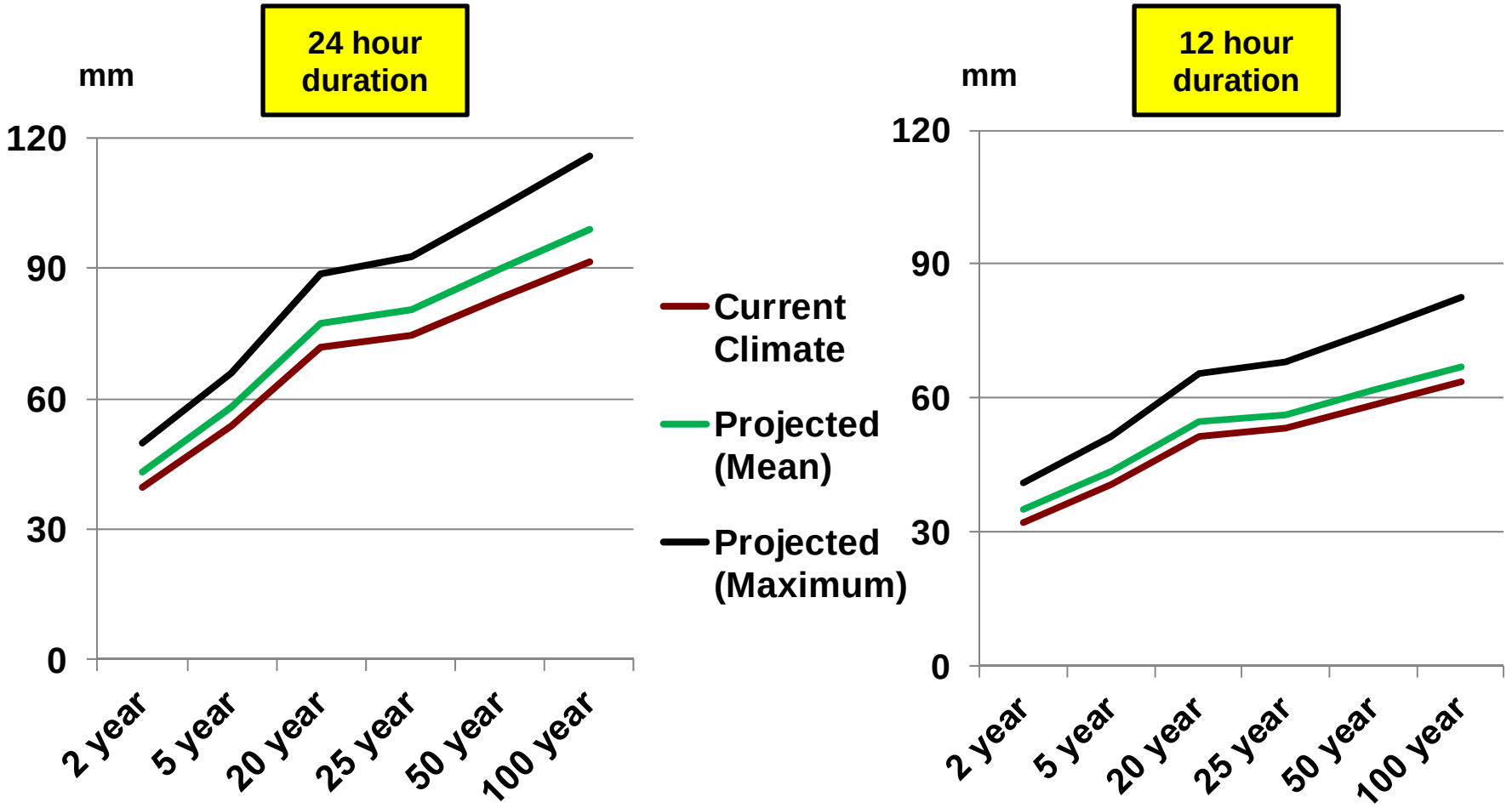
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
Battle Harbour



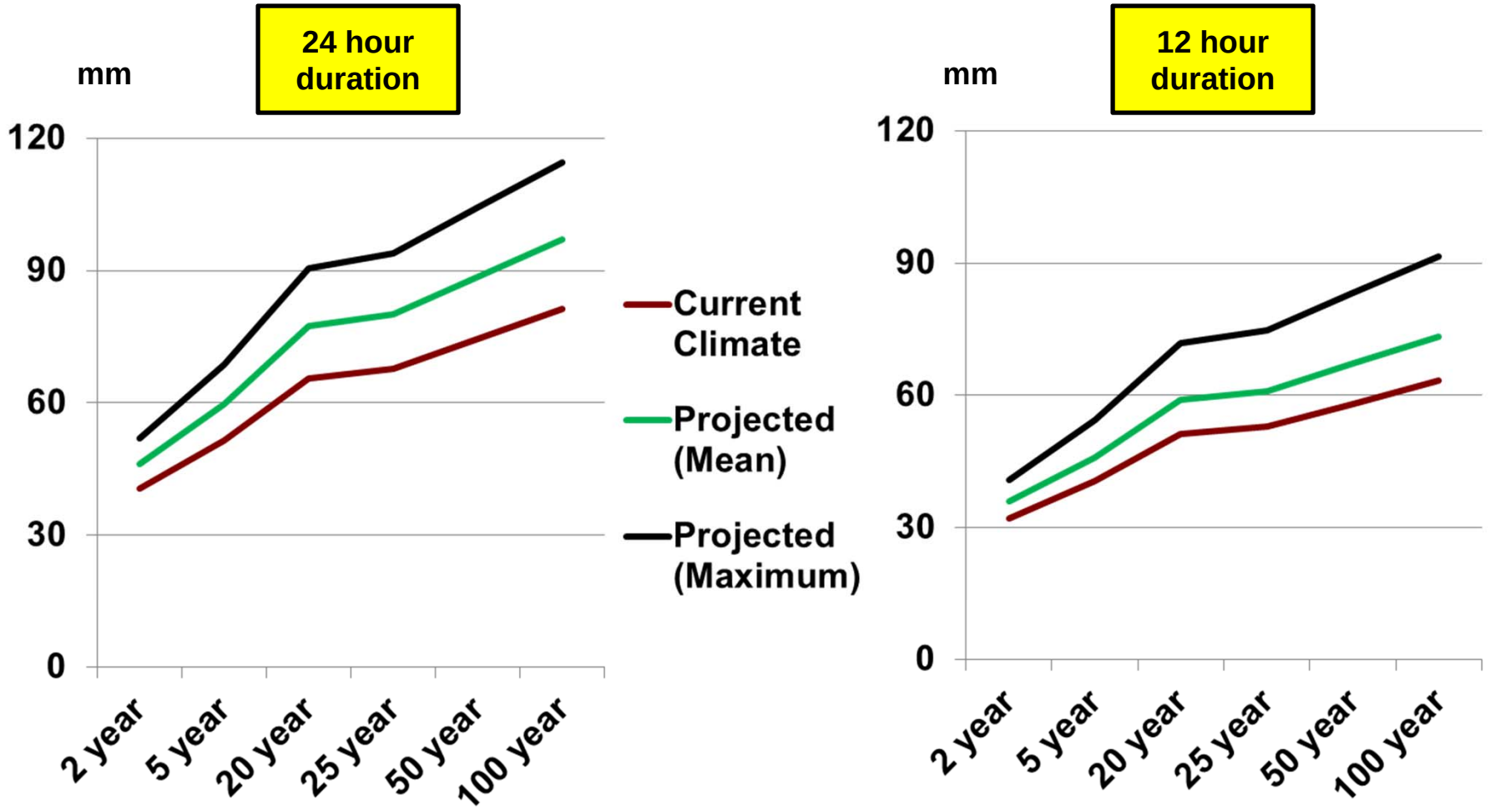
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
Mary's Harbour



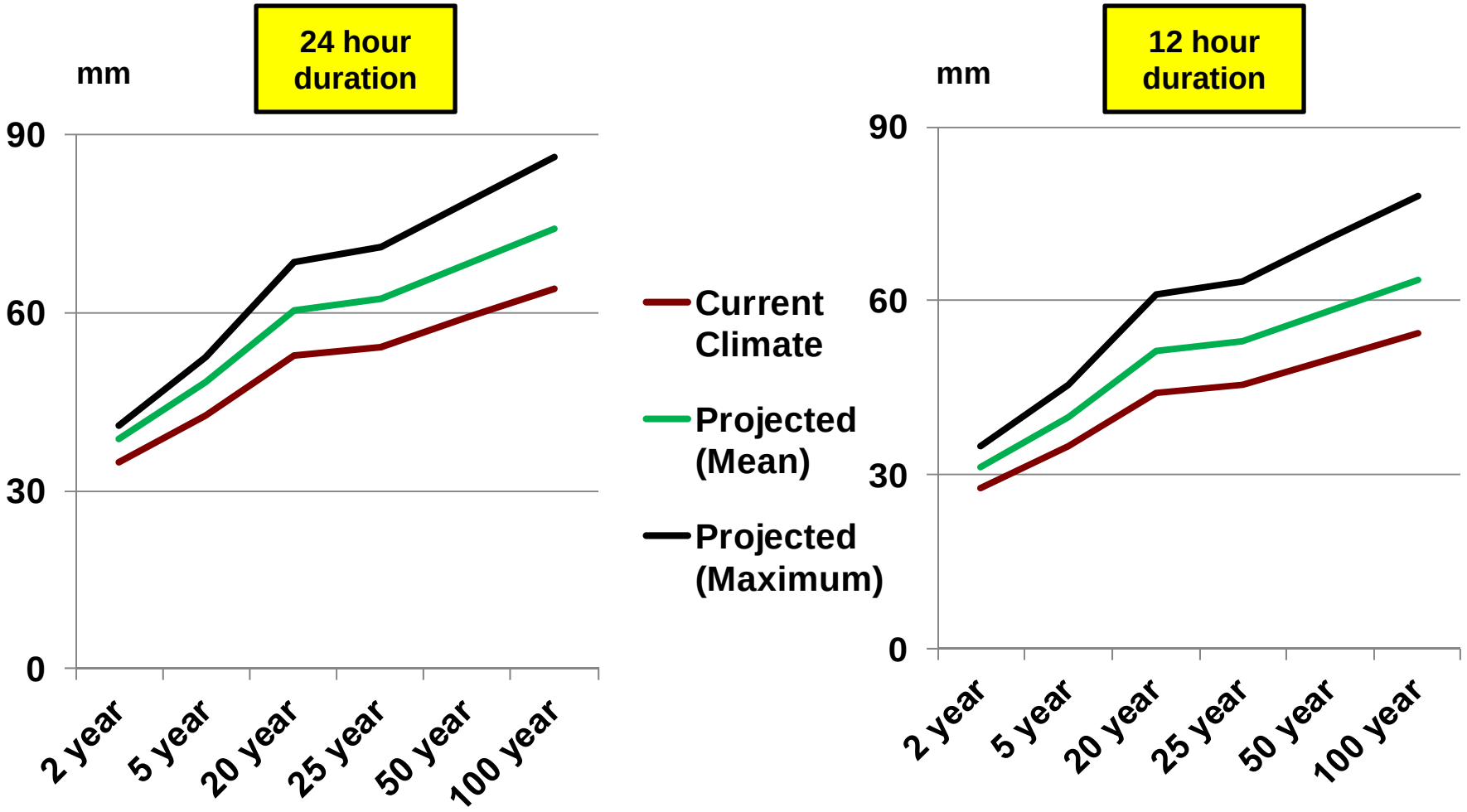
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
Goose Bay



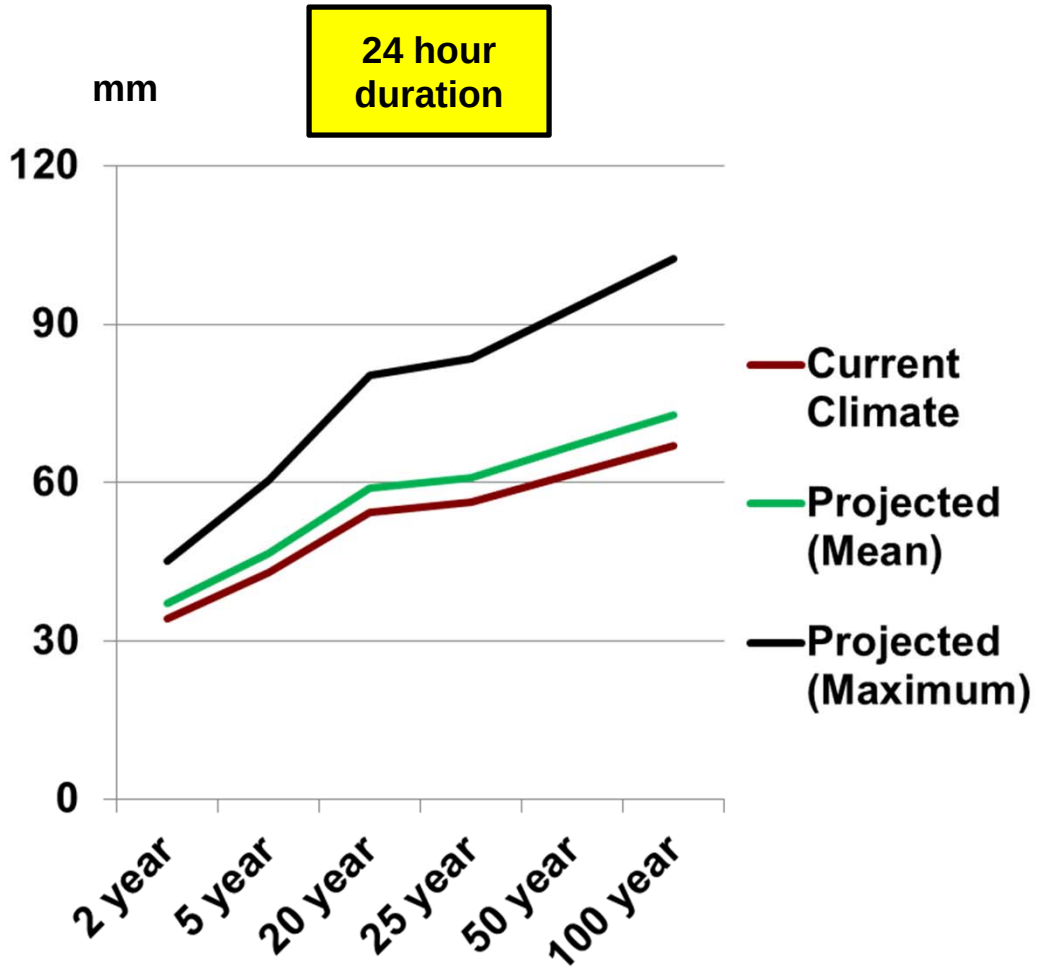
Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

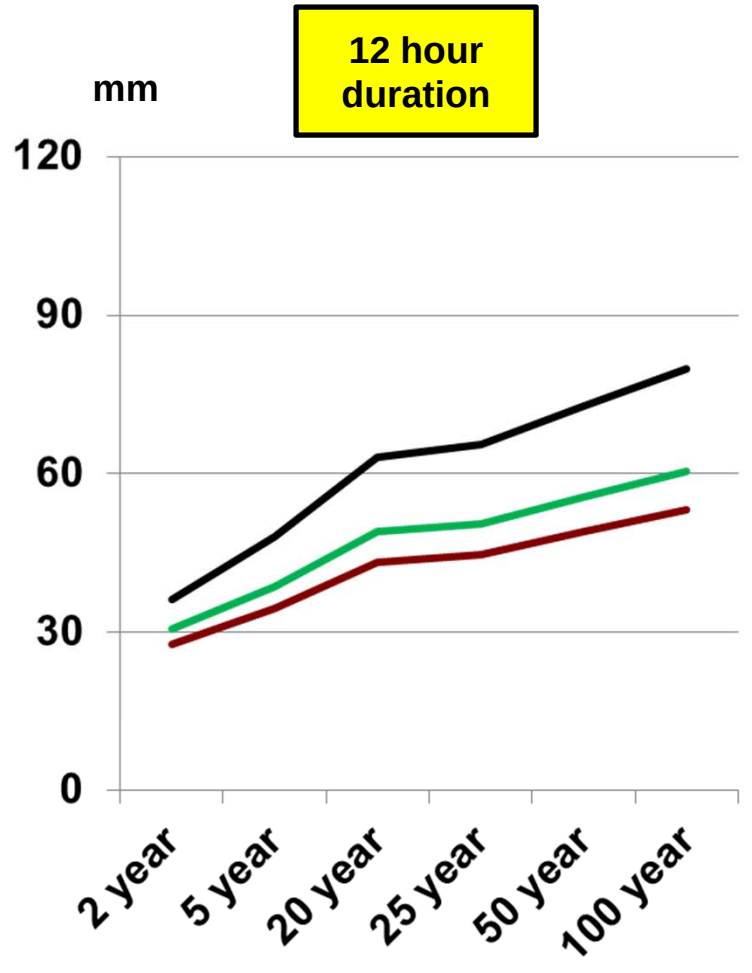
Extreme Weather Precipitation
Churchill Falls



Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

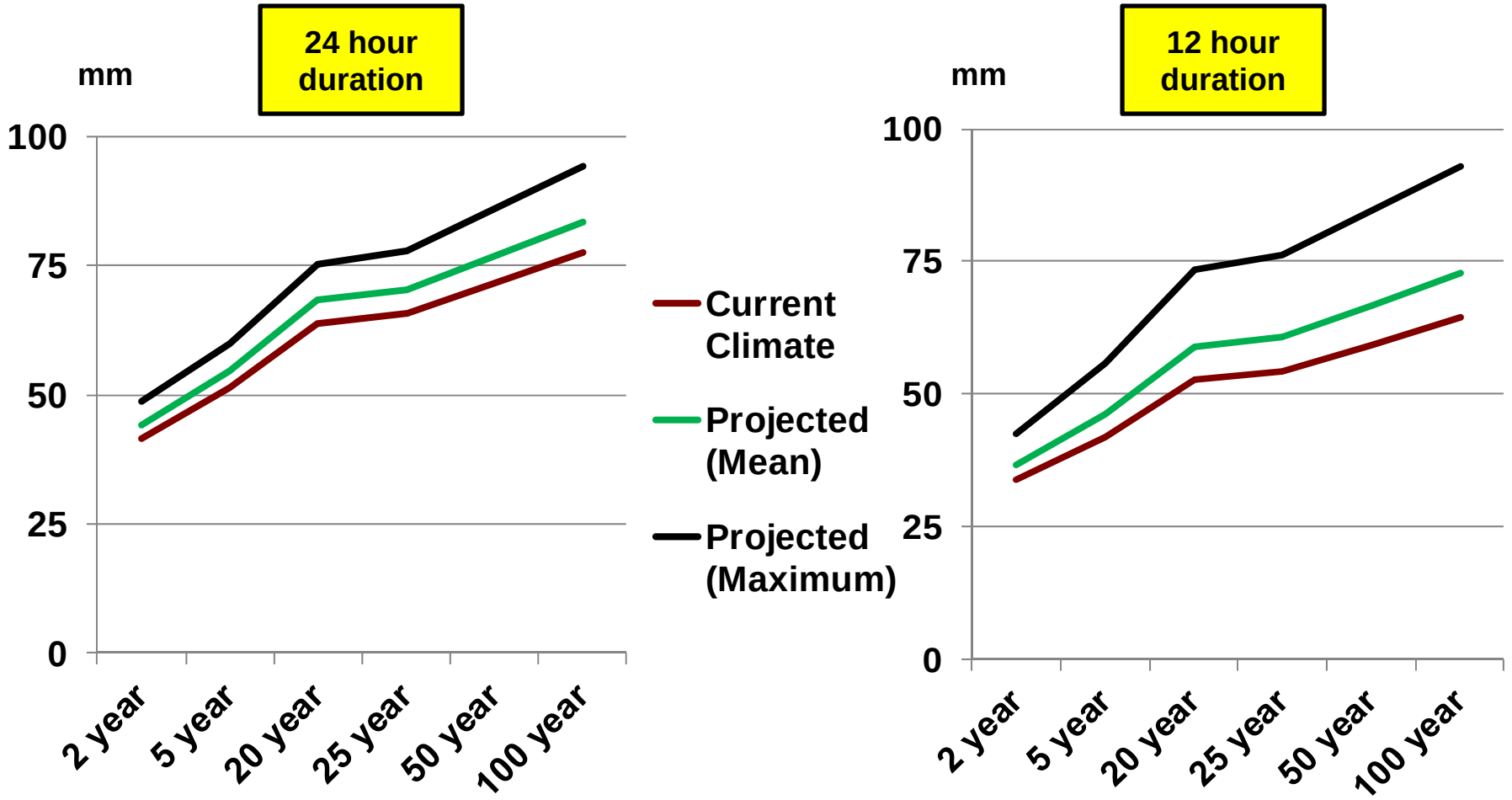
Extreme Weather Precipitation
Wabush





Data for 6 hour duration is also available. Projected (minimum) precipitation is not shown as it would be expected that infrastructure would not be constructed for minimal extreme precipitation events.

Extreme Weather Precipitation
Nain



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