



Guysborough Census Division: Climate Risk Summary

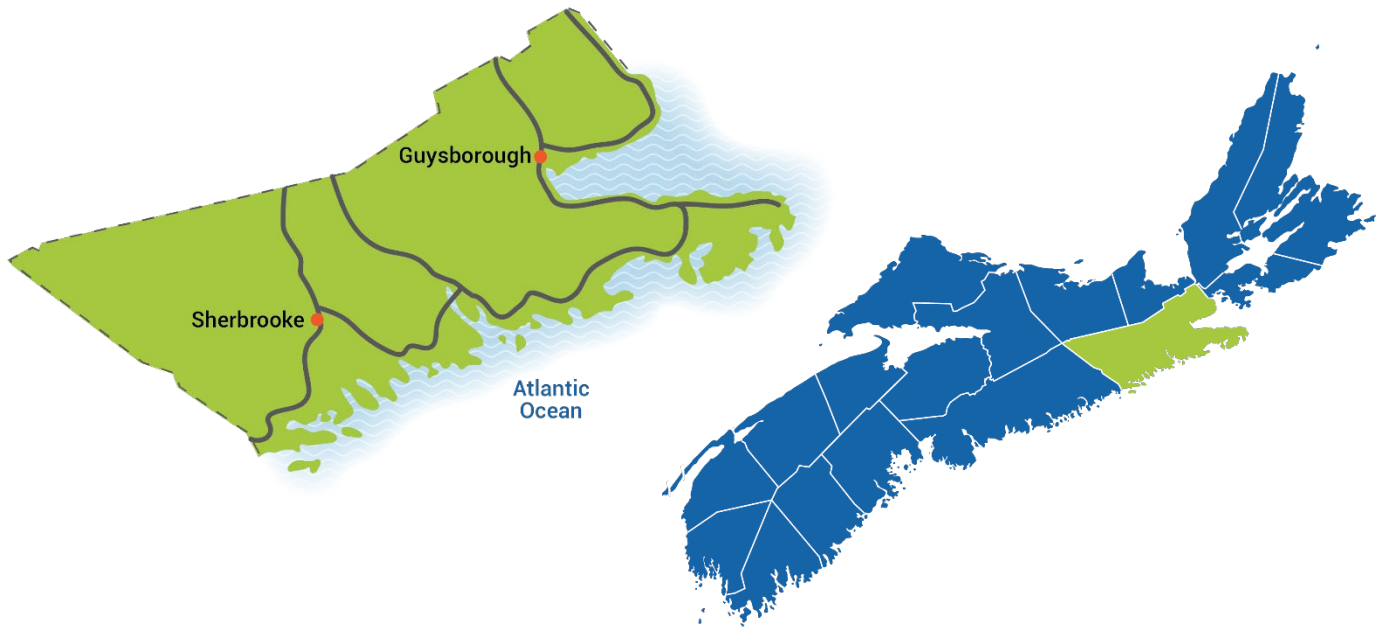
December 2022

Prepared by:

Nova Scotia Department of Environment and Climate Change

climatechange@novascotia.ca

Guysborough Census Division



Climate Change Projections

The evidence is clear – Nova Scotia’s climate is changing. Analysis of local climate change projections and literature has identified how the province’s climate is expected to change over the coming decades. The trends presented here are based on model runs for a high emissions scenario (RCP8.5) from the Intergovernmental Panel on Climate Change (IPCC)’s Fifth Assessment Report (AR5) from 2013, with the outputs from these global climate simulations statistically downscaled by the Pacific Climate Impacts Consortium (PCIC) to better account for local geography and climate patterns.

Temperatures are continuing to rise.

Average annual temperature is projected to increase 2.6°C by mid-century and 4.5°C by the end of the century. More frequent extreme heat will make days and nights more uncomfortable, drought and wildfire more likely, and average winter temperatures may rise above freezing.

Precipitation patterns are changing.

Warmer temperatures will mean less snow and more rain, while rainfall events are also increasing in intensity. Total annual precipitation will likely increase, but more of that water will evaporate in warmer air or run off in more intense downpours. Risks of flooding and erosion are likely to increase.

Storms will be more frequent and more intense.

Warming oceans will enable tropical storms to track further north without losing strength, bringing higher peak wind speeds and more powerful storm surges. It will be more likely for larger storms to impact the province.

Sea levels are rising.

Projections for Nova Scotia indicate an increase of up to 1 metre in relative sea level by the end of the century. Higher sea levels have the potential to damage coastal communities and infrastructure, infiltrate freshwater supplies, and threaten sensitive coastal species and ecosystems. Storm surge and high tides will be more impactful with rising seas.

Ocean conditions are changing.

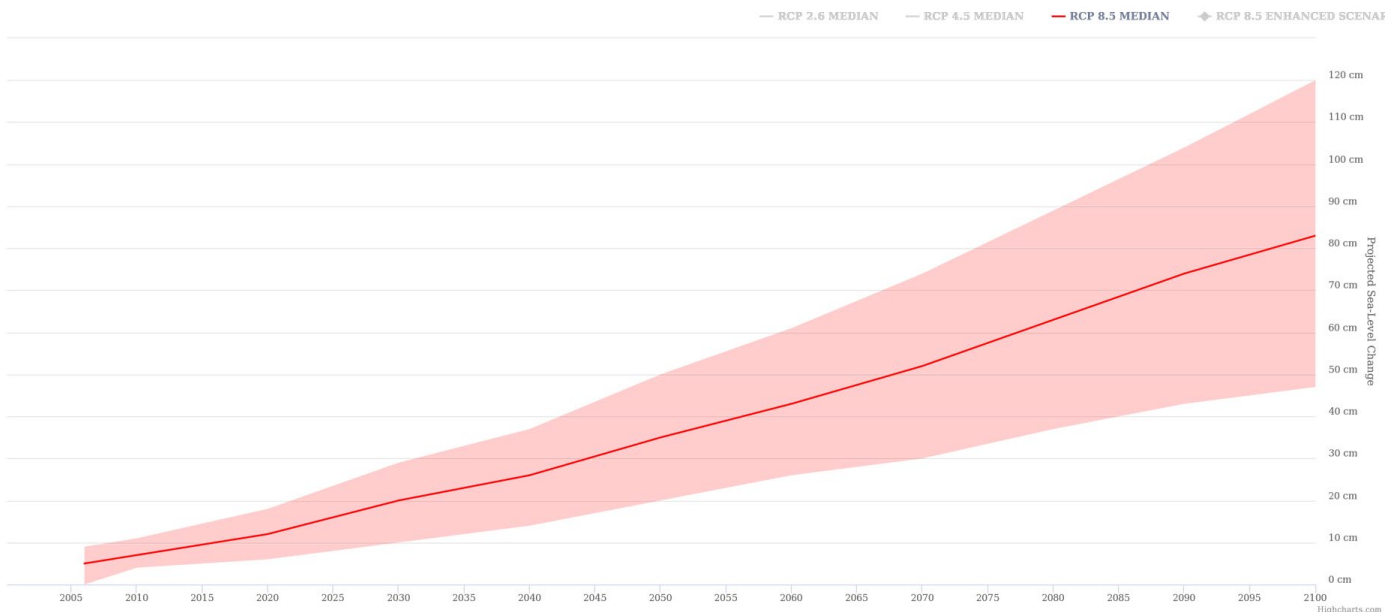
Sea surface and deep-water temperatures are increasing, ocean waters are becoming more acidic, dissolved oxygen levels are decreasing, and ocean currents could weaken due to the changing physics and chemistry of ocean waters. These changing conditions will likely make it harder for current ocean life and coastal ecosystems to thrive.

Climate Change Projections for Guysborough Census Division

Climate Index	Baseline (1981-2010)	Early century (2015-2045)	Mid century (2035-2065)	End century (2065-2095)
Annual hottest day	28.4°C	29.8°C	31.1°C	33.2°C
Days > 29°C	0.7 days	2.6 days	7.0 days	22.1 days
Nights > 18°C	0.8 nights	5.7 nights	15.1 nights	37.3 nights
Annual coldest day	-22.9°C	-20.6°C	-18.3°C	-14.7°C
Days < -15°C	16.2 days	9.6 days	4.7 days	1.1 days
Growing season length	196 days	211 days	226 days	251 days
Total precipitation	1379 mm	1435 mm	1467 mm	1523 mm
Days with snow	37.3 days	30.0 days	24.1 days	16.6 days
Intense rain days > 20	17.3 days	19.0 days	19.9 days	21.3 days

Median results for a high emissions scenario averaged over 30-year periods.

Sea Level Rise Projections for Guysborough Census Division



Relative sea level in this region is expected to rise approximately 85 cm by the year 2100.

Climate Risks for Guysborough Census Division

A provincial climate change risk assessment was completed in 2022 to explore what is at risk and the different effects of climate change on the well-being of Nova Scotians. A climate change risk assessment helps us to understand how the climate is changing. It also helps us to understand issues of concern and opportunities to act. Risks were explored across the province and for each census division, which align with the 18 counties in Nova Scotia. The assessment combines climate projections (AR5) with social, environmental, and economic information.

The background research and quantitative analysis identified:

- climate hazards of greatest relative concern
- priority regions, groups, and issues for further exploration, and
- opportunities.

Nineteen different climate hazards and opportunities were assessed. These climate impacts fall into four categories and offer the potential to improve or negatively affect the well-being of Nova Scotians.











Each climate impact was scored and ranked within each of these four impact categories for each census division and provincially. It is important to note that a lower ranking for a climate hazard or opportunity does not mean the impact is insignificant. The ranking indicates that the potential consequences for well-being are relatively higher or lower compared with other hazards or opportunities within that category.

Climate Risks for Guysborough (High Emissions Scenario)

As in all parts of Nova Scotia, the Guysborough census division is likely to experience all the climate impacts explored in the provincial climate change risk assessment to some extent during the next century. These hazards interact and change over time. **Taking an all-hazards approach to strengthening adaptive capacity and improving well-being will offer the most long-term benefit in the context of a changing climate.**

The following are the top five ranked climate hazards that negatively affect well-being in order of higher to lower for Guysborough for early and mid century under a high emissions scenario.

Early century (2015-2045)	Mid century (2035-2065)
 Heat extremes for ecosystems	 Heat extremes for ecosystems
 Shifting ecoregions	 Shifting ecoregions
 Fluvial flooding	 Fluvial flooding
 Agricultural pests and diseases	 Agricultural pests and diseases

By the mid century, the reduction in heating demand for buildings has the potential to contribute more to improved well-being for Guysborough relative to the other two impacts in this category.

The longer growing season offers benefits, but will need to be balanced with shifting ecoregions, heat extremes, and agricultural pests and diseases. While benefits from winter tourism will decrease over time, conditions for favourable summer tourism and recreation may present additional opportunities.

Potential Adaptation Opportunities

The risk assessment offers some insights into opportunities to reduce risk and adapt to the changing climate by looking at how we can reduce exposure and sensitivity to climate hazards and improve the capacity to cope and adapt. The following are the common adaptation approaches across census divisions.

- Further investigation based on specific climate hazards may yield insights into how to **reduce exposure**, such as for people, the natural environment, and infrastructure.
- Across all hazards, opportunities to enhance economic opportunities, improve financial security, and improvements to health could reduce **sensitivity**.
- Improvements to financial security and civic engagement and governance offer opportunities to improve **adaptive capacity**.

Every region in Nova Scotia has a unique mix of rural communities and regional centres with different populations, which offer strengths and vulnerabilities in relation to climate change. More information at the local level can help guide adaptation action, including for those who may be disproportionately impacted within communities. Regional collaboration is an equally important approach to address climate impacts and risks that are not confined within census division boundaries.

For More Information

For more information on how the climate is changing, climate risks for Nova Scotia, and additional regional information, please see *Weathering What's Ahead: Climate Change Risk and Nova Scotia's Well-being* and the associated technical report at <https://climatechange.novascotia.ca>.