Future Climate in Mt. Assiniboine Provincial Park

Modelling Future Climate

This poster presents scenarios of future climate for the Mount Assiniboine region. The scenarios represent the full range of possible future climates rather than specific predictions. Every result within the range is considered equally possible.

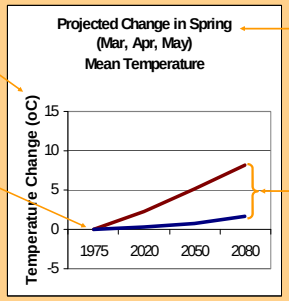
There are two main reasons for this lack of certainty. First, climate change scenarios start with a set of global climate models (GCMs) – simplified representations of the climate system that take into account relevant physical, geophysical, and chemical processes. Although the models are tested to ensure that they can reasonably simulate past and current climates, scientists are still refining these models as they learn more about the climate system.

Second, climate change scenarios also incorporate a set of greenhouse gas emission scenarios. Each emission scenario involves different assumptions about changes in global population, energy use, technology development, gross domestic product, and other socio-economic variables during the 21st century. These variables will affect total greenhouse gas emissions from human activity, and thus the magnitude and timing of climate change.

The climate change scenarios for the Mount Assiniboine region are based on data from several different GCMs using a selection of emission scenarios. The graphs on the right illustrate possible future trends for five climate variables: temperature, precipitation, snow water content, soil moisture, and wind speed, on an annual and seasonal basis. The graphic below provides guidance on how to interpret the five sets of graphs.

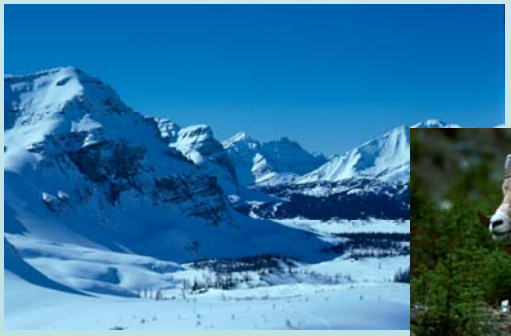
The units may be reported in either *absolute* (e.g., ºC) or *relative* (e.g., %) terms depending on the variable.

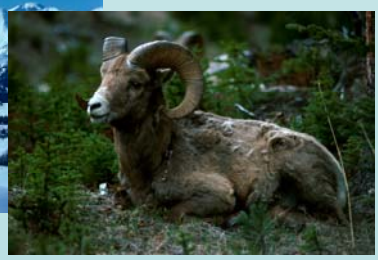
The historical baseline is based on the period 1961-1990 and is plotted in 1975.

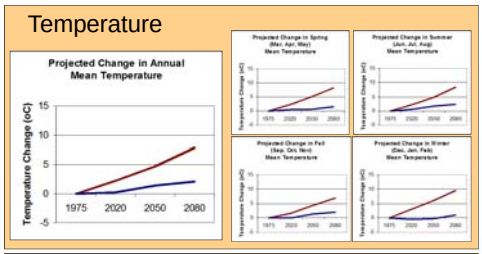


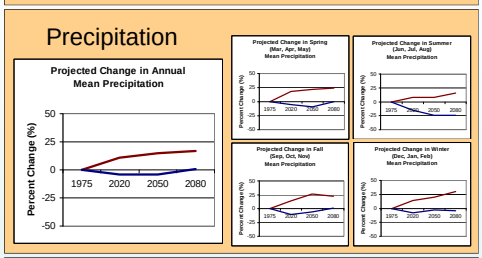
The title provides the *Climate Variable* and the reported *Time Period*.

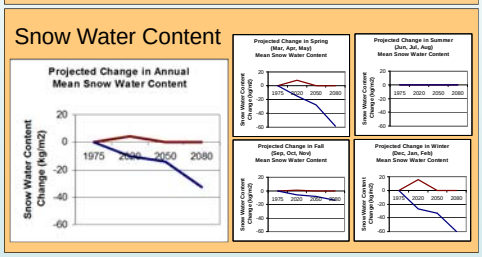
The expanding envelope shows the full range of available GCM model results for all future scenarios. The general envelope projection over time is used to interpret general trends. A greater range within the expanding envelope indicates greater uncertainty.

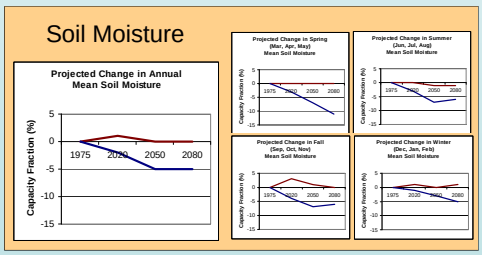


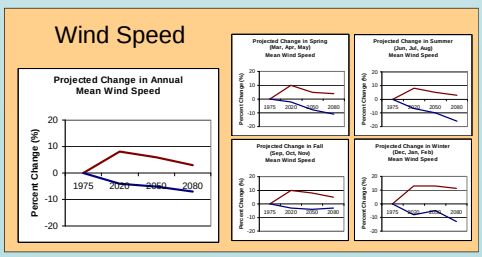












Summary of Results

This table below summarizes the results from the climate change scenarios. For some climate variables, the general trend is clear, even though there may be uncertainty about the magnitude of change. For example, it is very likely that temperatures will rise in the park area, although the amount may be anywhere from 2ºC to 8ºC. For other climate variables there is uncertainty about the general trend. For example summer season precipitation may either rise or fall in future.

Summary of Change Scenarios for Selected Climate Variables Projected to 2080

Variable	Focus Period	Range of Magnitude / Direction of Change	Summary of Projections
Mean Temperature	Annual	+2.1ºC to +7.9ºC	• Generally projected to rise steadily over time, annually & seasonally
	Summer	+2.3ºC to +8.5ºC	
	Winter	+1.0ºC to +9.5ºC	
Mean Precipitation	Annual	+1% to +17 %	• Generally projected to rise over time, varying annually & seasonally • Greatest uncertainty in summer
	Summer	–24% to +16%	
	Winter	–4% to +30%	
Mean Soil Moisture	Annual	0% to – 5%	• Generally projected to decrease over time, annually & seasonally
	Spring	0% to –11%	
	Summer	–1% to –6%	
Mean Wind Speed	Annual	–7% to +3%	• Significant uncertainty both annually & seasonally • Greatest uncertainty in winter
	Summer	–16% to +3%	
	Winter	–13% to +11%	
Mean Snow Water Content	Annual	--33% to 0%	• Generally projected to decrease over time, annually & seasonally • Greatest decrease in winter & spring
	Spring	--59% to 0%	
	Winter	--60% to 0%	

Climate Change and Park Planning

Climate change challenges some of the basic assumptions on which park management is based. The management goals for Mount Assiniboine Provincial Park include human use and enjoyment, and protection of natural values historically present in the park. Management has ensured that human use and enjoyment of the park does not harm natural values, but has otherwise been relatively 'hands off'. This approach, effective under the relatively stable climate conditions of the past century, may not be as suited to the changing climate conditions projected for the 21st century. Managing Mount Assiniboine and other parks in the face of rapid change – and a level of uncertainty about the future – is a challenge that B.C. is just starting to explore. The work presented here is a first step in what will almost certainly be an ongoing dialogue between park planners, scientists, community groups, park users, and others interested in the long term future of Mount Assiniboine Provincial Park.