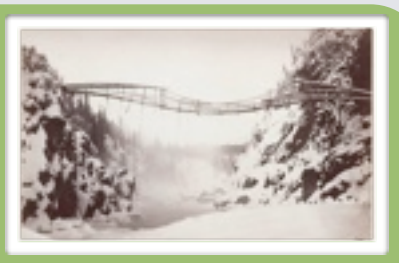
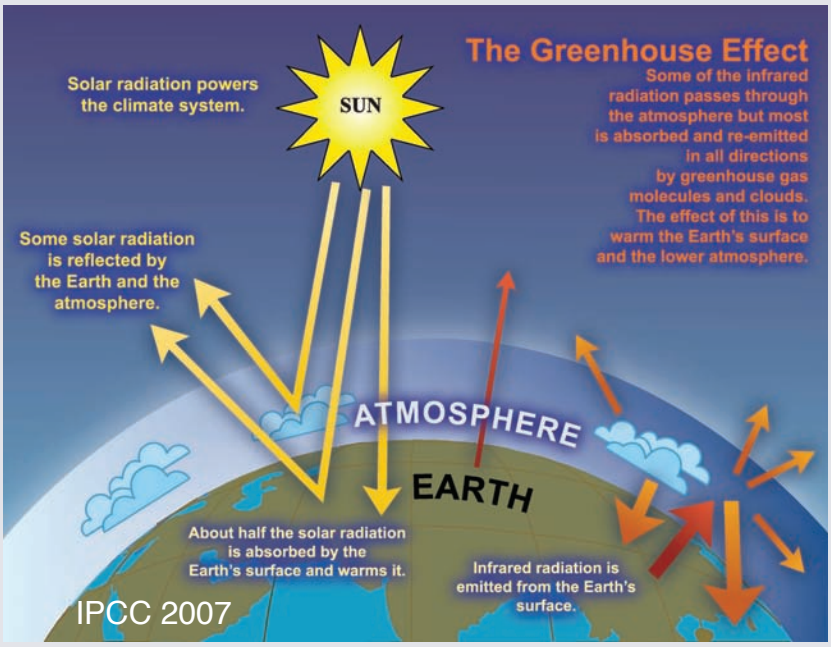
CLIMATE CHANGE
IN THE NORTHWEST SKEENA



What is Climate Change?

Climate is the average weather of a location over a long period of time.

Observations have shown changes in weather globally, and it is the statistics of these changes in weather over time that identify climate change. The present climate change is primarily caused by human emissions of greenhouse gases (GHGs: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), etc.) causing an enhanced greenhouse effect.



Climate change can affect temperature, precipitation, snow amount, humidity, wind, amongst other weather variables. Also as climate changes, the probabilities of certain types of weather events are affected. For example, as Earth's average temperature has increased, some weather phenomena have become more frequent and intense (e.g., heat waves and heavy downpours), while others have become less frequent and milder (e.g., extreme cold events).

These changes to the climate system have profound impacts upon both natural and human systems.

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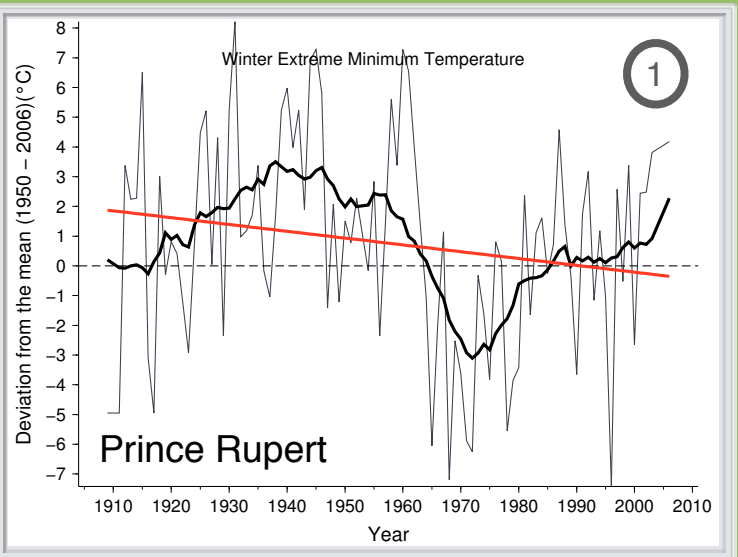
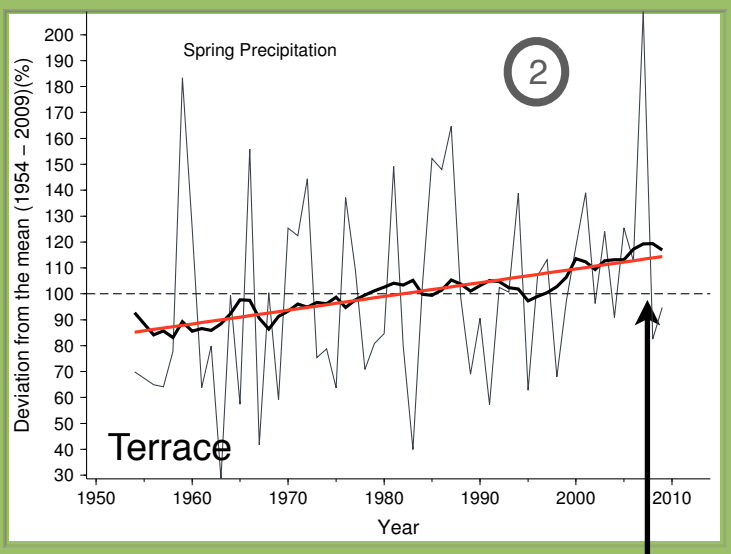
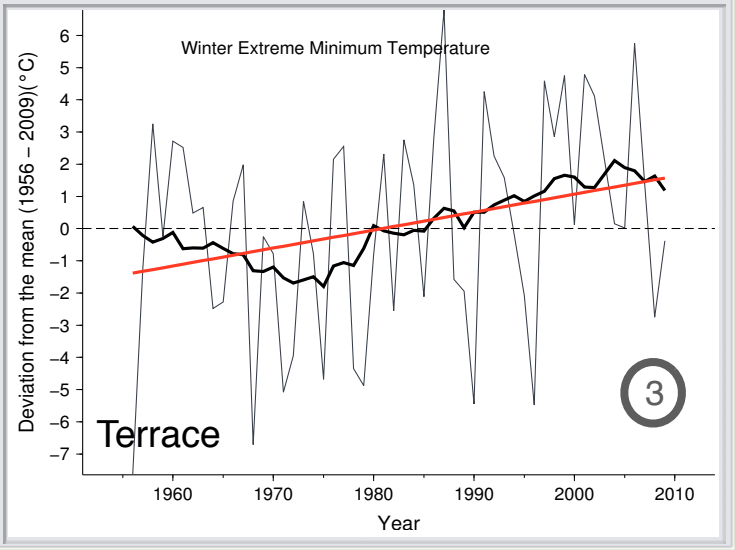
How has climate changed in the Skeena region?





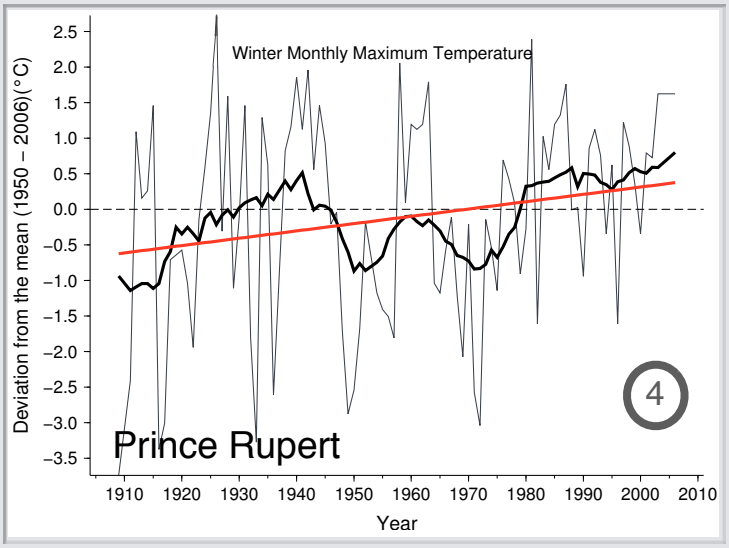


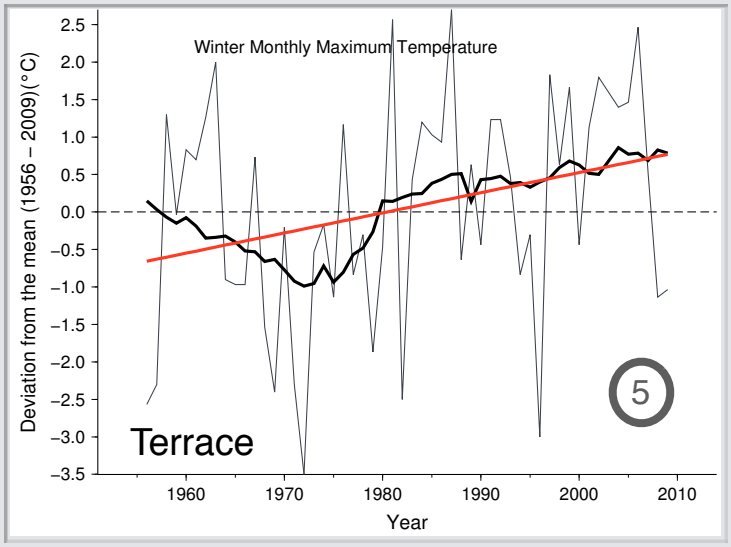
2007 Flood

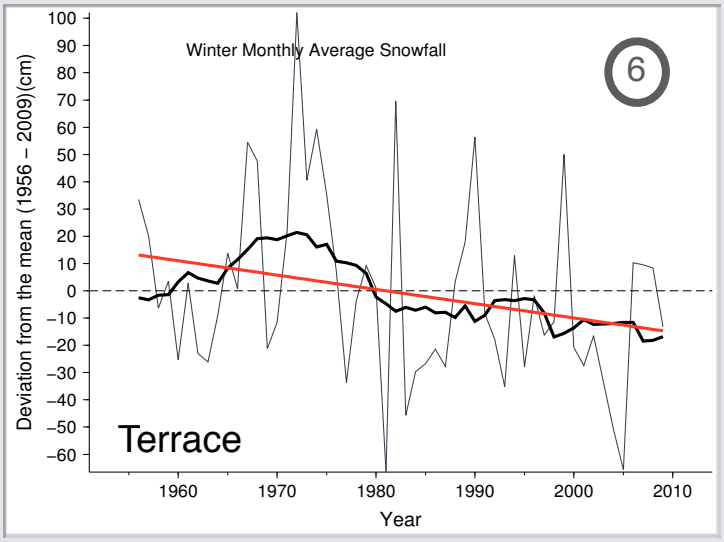
1936 Flood

From the historical record, climate in the region has been changing. Have you noticed changes?

Monthly climate data
15-year moving average
Linear regression



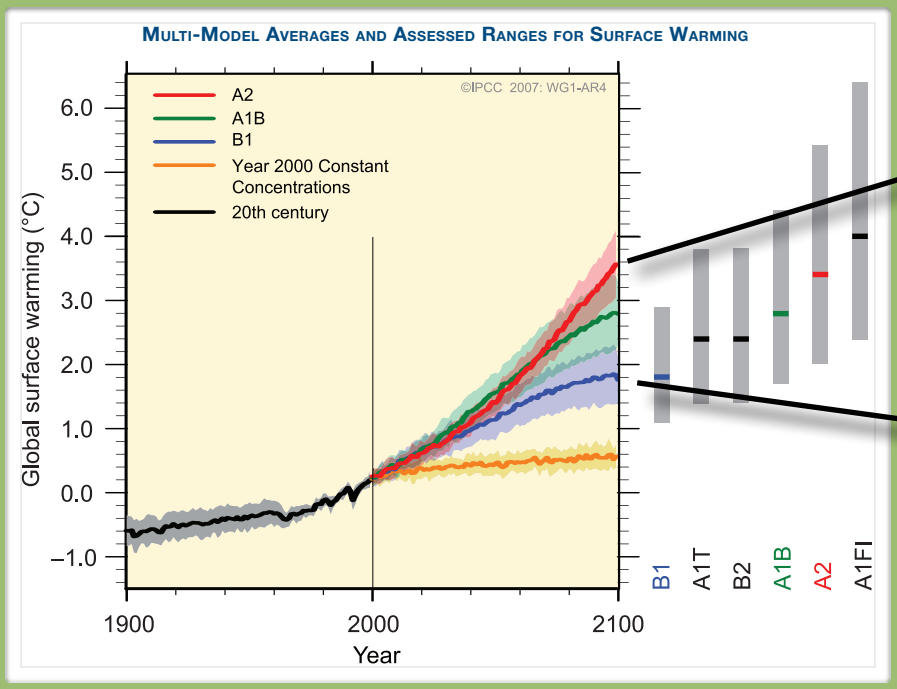


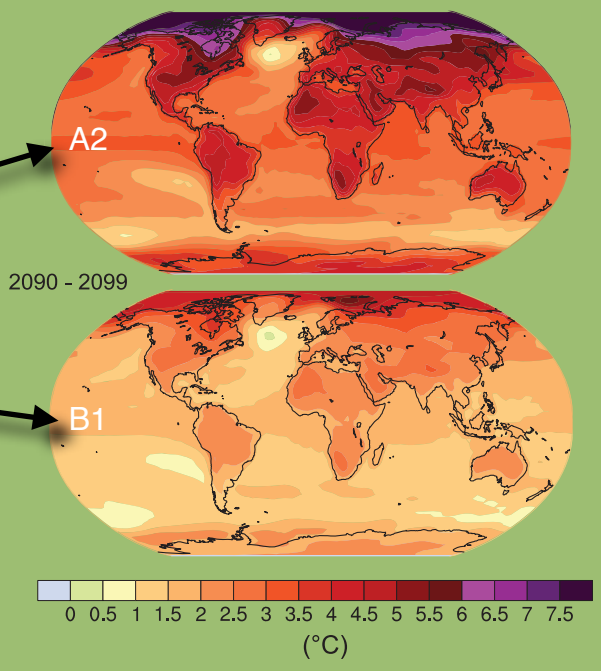


What influences climate change in the future?

Our future climate is very uncertain and depends on many factors. The emission of greenhouse gases is closely tied to how society develops into the future and is the primary driver of future climate change. Also important is the influence of feedbacks within the climate system, such that warming caused by the greenhouse effect is amplified through positive feedback loops, which then result in further warming.

To project how our climate will change in the future, the Intergovernmental Panel on Climate Change (IPCC) has developed scenarios (B1, A2, etc.), which attempt to project future global GHG emissions based upon assumed changes in global population, sources and use of energy, global cooperation, and regional differences in per capita income. These emission scenarios are then used as input to global general circulation models (GCMs) that simulate the changes in climate due to the GHG forcing (the 'Greenhouse Effect'). Of course there is uncertainty with these models due to gaps in our understanding of the climate system. This uncertainty is represented by the shaded regions surrounding each scenario's projected warming in the figure below. The A2 scenario is used in the following pages to project future changes in the Skeena region.





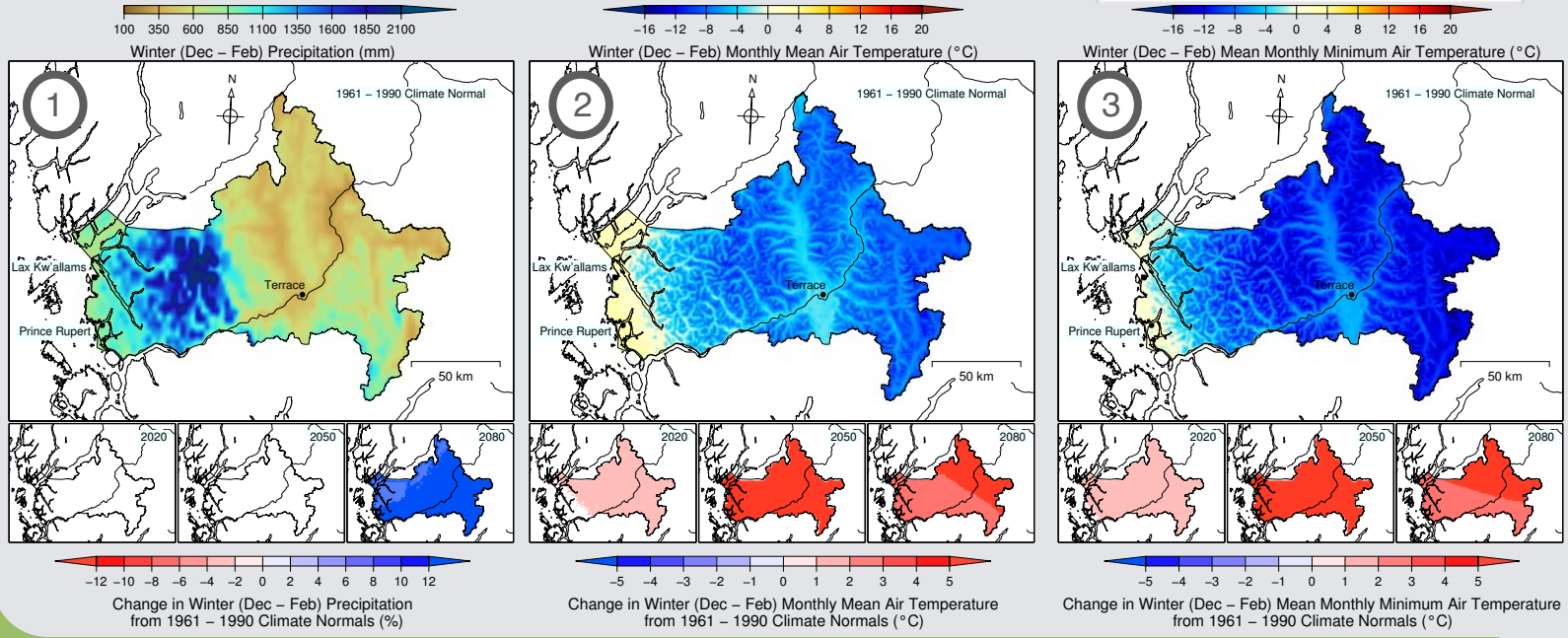
Note amplification of warming in polar regions is evident in the GCM simulations of two possible future climate scenarios (A2 and B1).

What are the projected changes in the Skeena?

Winter

Winters are projected to become wetter into the future with more precipitation falling as rain. The mean temperature of the Skeena region is projected to be warmer with minimum temperatures higher than present.

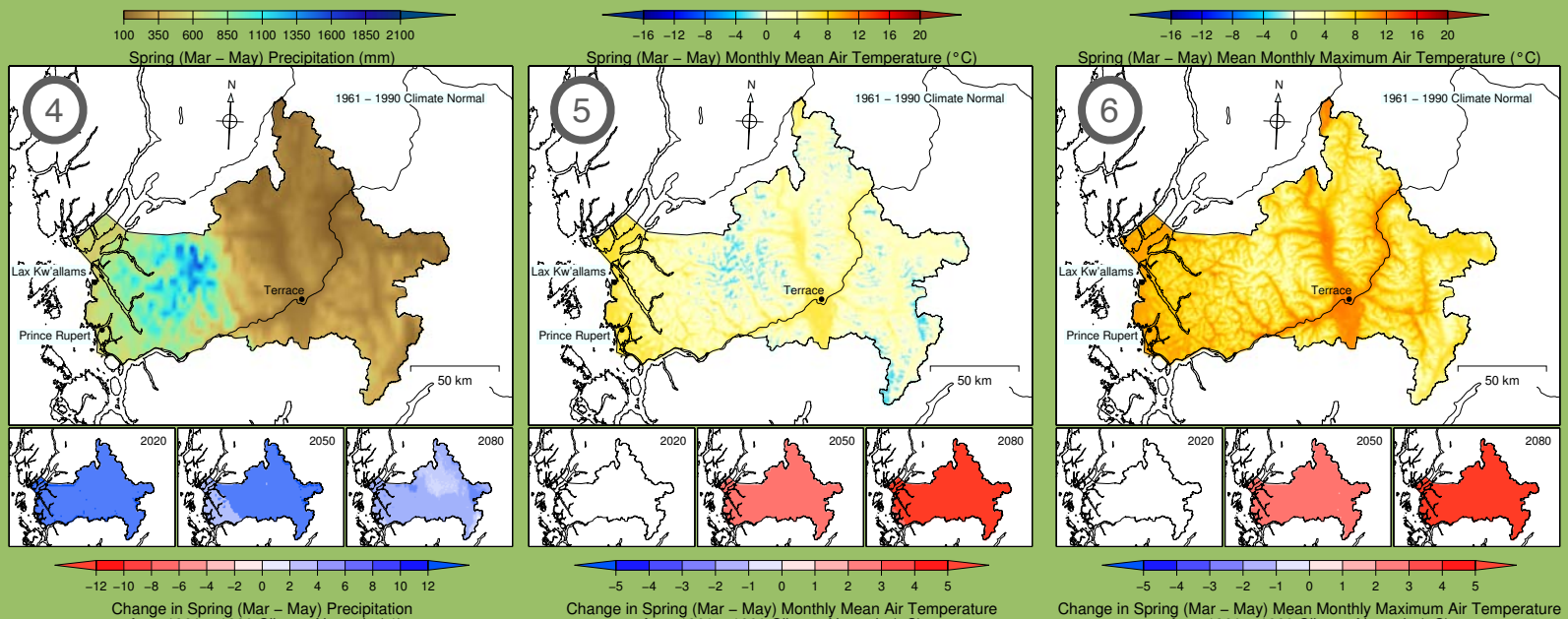
What is the impact of warmer winters?



Spring

Spring is projected to be warmer and wetter as our climate changes. By 2080, the mean monthly maximum temperature is projected to be almost 5 °C warmer than present.

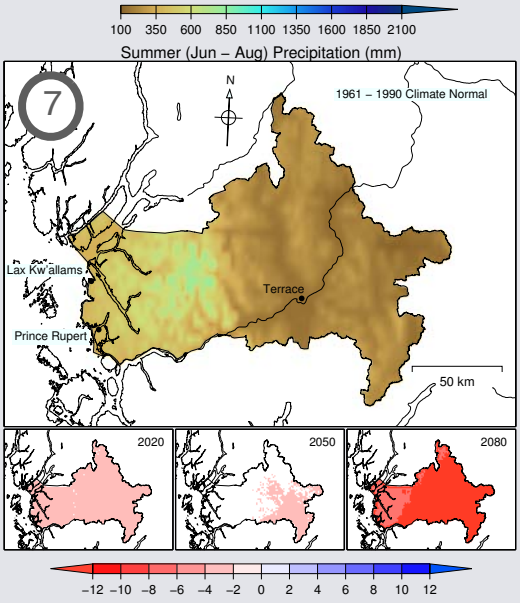
What will warmer springs mean to our region?

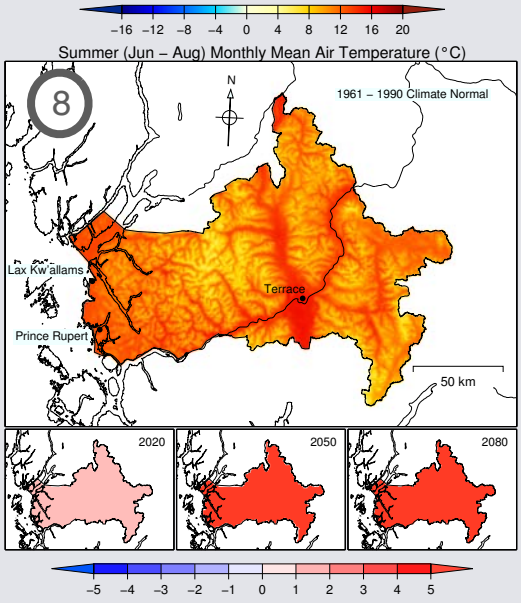


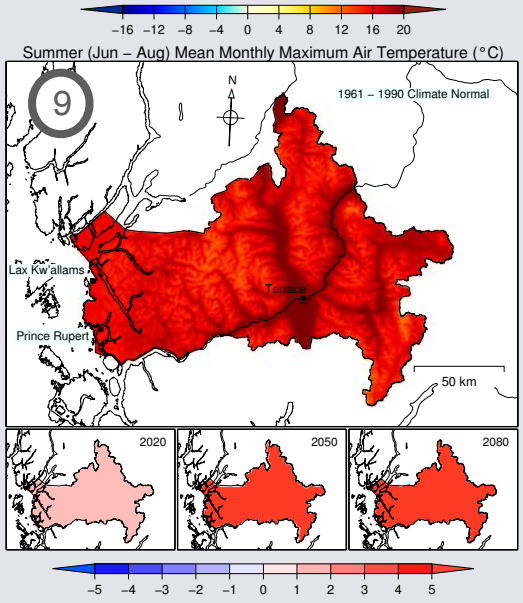
Summer

Summers will be warmer as the climate changes, for both the maximum and mean air temperatures. The summers will also be drier as precipitation decreases, further increasing the seasonality of precipitation to the Skeena region.

How will drier summers change the region?



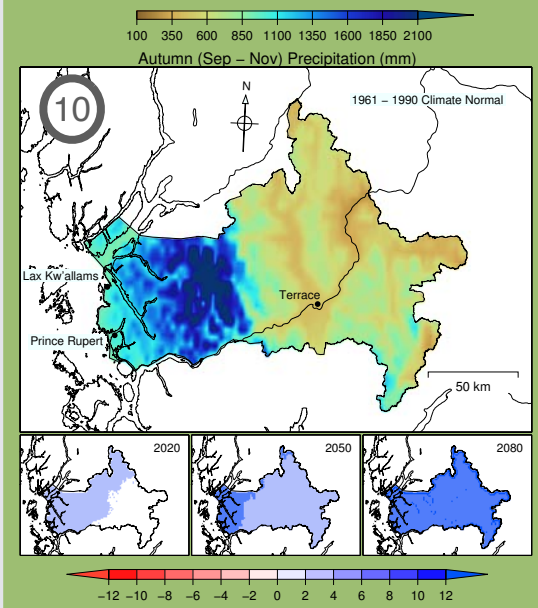


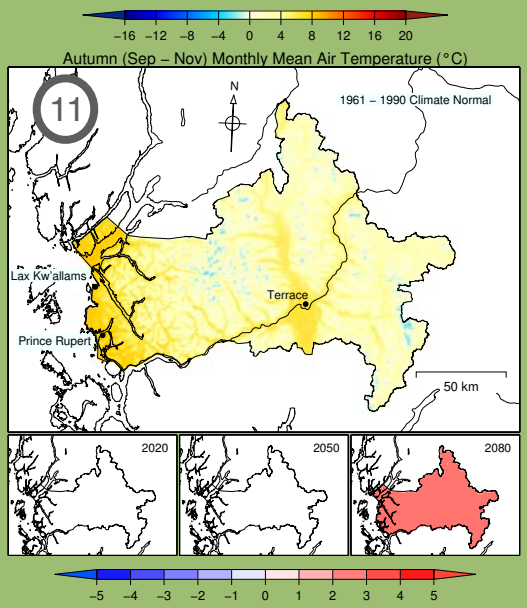


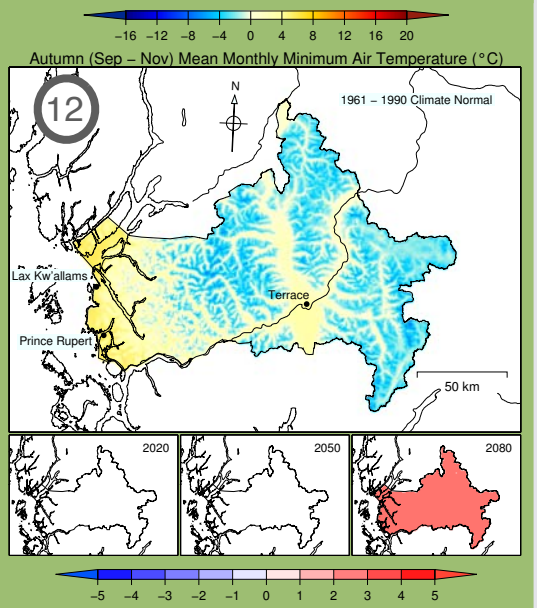
Autumn

Autumn is projected to be warmer than present with more rainfall. The transition from summer to autumn will become more pronounced as summers become drier and autumns wetter. Minimum and mean air temperatures will also warm as the climate changes

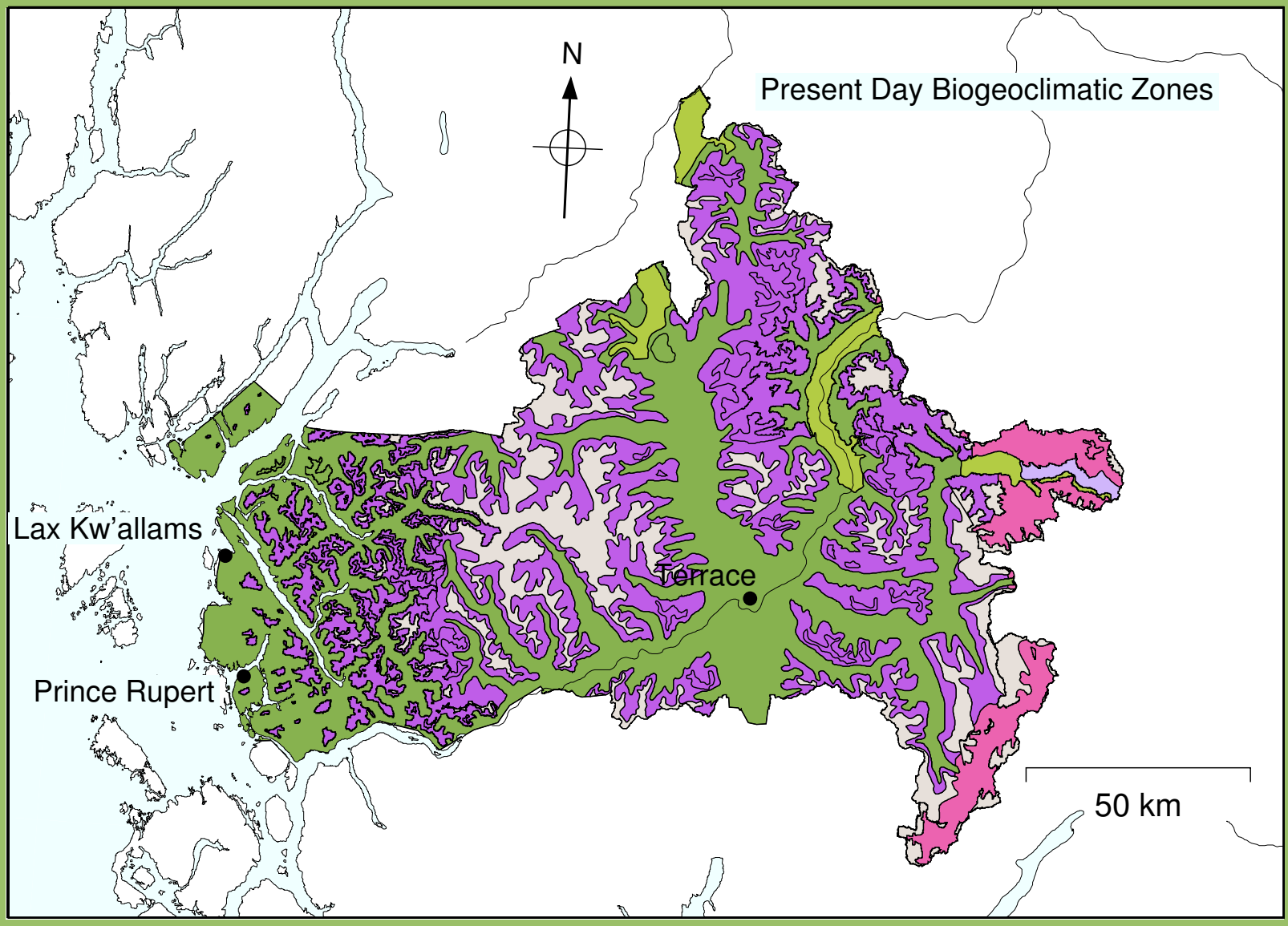
What are the effects of more precipitation in the fall?



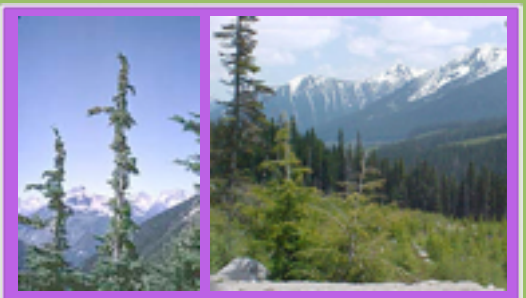




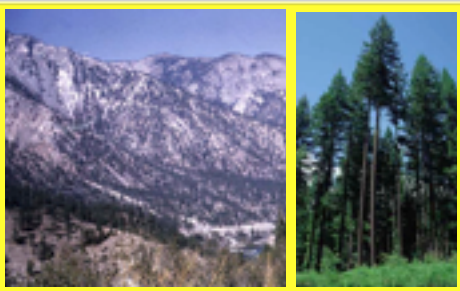
One way to visualize our forest ecosystems is to use biogeoclimatic (BEC) zone mapping. In the BEC system, climate is considered to be the principal environmental factor influencing ecosystem development. Each BEC zone is a geographic area where all points within it contain similar patterns of energy flow, vegetation, climate, and soils. Each zone is then characterized by the general occurrence of dominant climax tree species (eg. Mountain Hemlock).



How will climate change impact our forests?



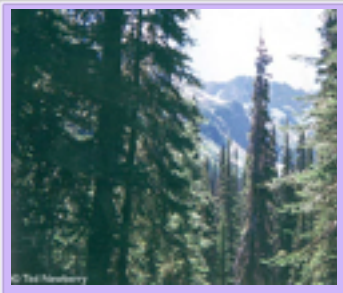
Mountain Hemlock (MH)



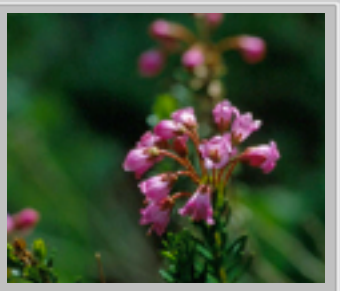
Interior Douglas Fir (IDF)

Engelmann Spruce-Subalpine Fir (ESSF)

How will these changes impact how we use our forests?




SubBoreal Spruce (SBS)

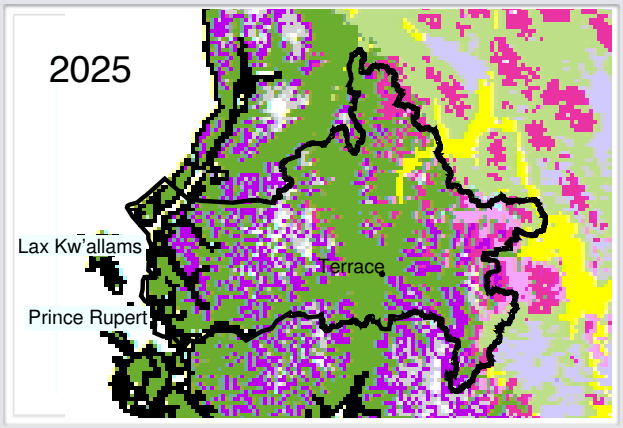
Alpine Tundra (AT)

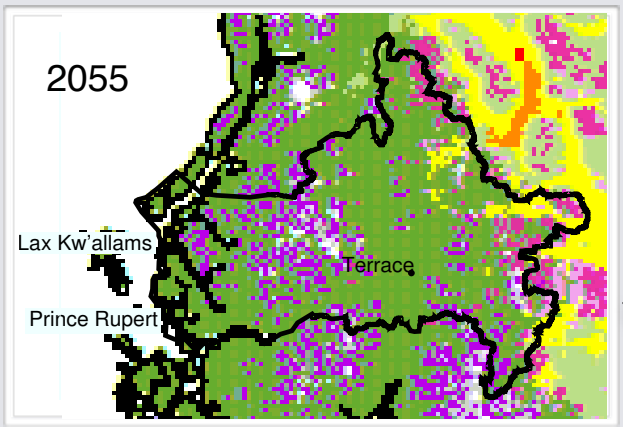

Interior Cedar-Hemlock (ICH)

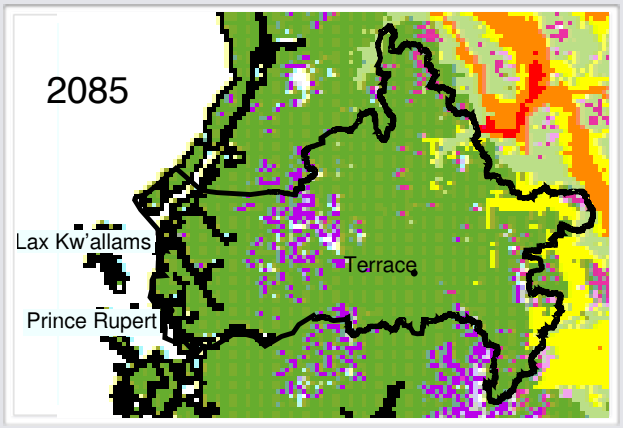


Coastal Western Hemlock (CWH)

Future projections of BEC zones indicate shifts in the ecological zones in response to changing climate. In the figures above, projected climate from a collection of general circulation model simulations (IPCC 2001 Scenario IS92a) was used to predict how BEC zones will shift at different periods in the future. These maps only present a possible future as they do not account for how fast vegetation can, in reality, respond to changing climate.







Large expansion of CWH, encroachment of IDF, and reduction of MH, ESSF, SBS, and AT

Adapted from Hamann & Wang (2006). Scenario IS92a is approximately equivalent to IPCC 2007 Scenario B2 (see figure at bottom of pg. 3 of this brochure)

What can this project do for you?

Interior BC communities were surprised and devastated by the mountain pine beetle impacts on their forest ecosystems and forest-dependent communities. The aim of this project is to help Northwest Skeena First Nations and municipalities reduce the risk of similar regional climate shocks.

Climate change compounds threats from other regional environmental and social challenges. The Future Forest Ecosystems Scientific Council (FFESC) project, "*Climate Change Adaptation Planning for Northwest Skeena Communities*", combines biophysical modelling, social science and community engagement in a participatory approach to build regional capacity to prepare and respond to climate change. This two-year project will be launched with community consultations in Prince Rupert, Lax Kw'alaams, and Terrace.

The goal of the project is to work *with* communities in the Northwest Skeena region to build knowledge and understanding that will assist them in developing their own climate change adaptation plans. The project team looks forward to working with local community leaders, resource managers, and interested citizens to identify key issues and knowledge gaps, opportunities and challenges that face the region in the context of a changing climate. The project aims to foster the accumulation of knowledge, experience and tools that will

How can you become involved?

The success and relevance of this project depends on the input and engagement of people in the Skeena region. If you would like more information on this project, would like to become involved, or know someone who you think should be, please get in touch with us.
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Photo Credits: Pg.1 (Terrace - Terrace Library / Wotsonqua Bridge 1872 - National Archives of Canada / First Nations girl fishing 1915 - National Archives of Canada / Bridge over the Skeena - Mike Turner), Pg. 2 (Usk in flood - Helene McRae / House falling into Skeena - Courtesy of Yvonne Moen / Terrace Hotel - Terrace Library), Pg. 4 (Lakelse Lake in Winter - Mike Turner / Meadow scene - Brian Huntington), Pg. 5 (Mountain - Brian Huntington / Woods near Kleanza Creek - Mike Turner), Pg. 6 (Tree planting - Catrin Jones / Forestry internships - www.chilcotinholidays.com / BEC stand level and landscape photos - Derek Marcoux / Pine mushroom - Shannon Berch)