Sub-Boreal Spruce Climate Adaptation Workshop: Breakout Activity Scenarios

John Prince Research Forest:

The John Prince Research Forest (JPRF) is 16,683 ha of provincial-owned forestland, tenured under a special-use permit (SUP) for use as a research and educational facility, with yearly-issued occupancy licence-to-cuts (OLTC), which provide authorization to cut and sell 20,000 m^3 of timber annually. Revenues from these log sales support research and educational programs.

Management Goals and Objectives:

The JPRF is managed by a non-profit corporation (Chuzghun Resources Corporation) which is jointly owned by the University of Northern BC (UNBC) and Tl'azt'en First Nations. This partnership was formed 28 years ago to promote natural resource research and education that demonstrated innovative sustainable natural resource management through integration of traditional and western science and the recognition of diverse cultural values. The nature of their vision for the lands and resources of the JPRF were to achieve and maintain a healthy land base, and these are the principles, they put forward to guide management:

- Support natural ecological conditions and cycles,
- Maintain biodiversity,
- Protect the productive capacity of the land-base and all resources,
- Ensure activities aim at protecting, restoring and maintaining existing productive capacity of all resources,
- Ensure that the level of resource extraction is secondary to the objectives for the sustainability of the natural resources,
- Manage for multiple uses, provide recreational opportunities,
- Achieve long-term sustainable yields from the natural resources.

Government Defined Goals and Objectives:

As a forest tenure holder, the JPRF (like all forest licences in BC), must meet the forestry goals and objectives of the Province of BC. The Forest and Range Practices Act (FRPA) sets out how all forest and range practices and resource-based activities are to be conducted on Crown land while ensuring protection of everything in and on them. Eleven resource values are identified and protected under FRPA, including: biodiversity, cultural heritage, fish and riparian values, forage/associated plant communities, recreation, specific resource features, soils, timber, visual quality, water quality, and wildlife.

Resource	Objective (*Non-timber values - without unduly reducing the supply of timber from British Columbia's forests*)
Timber	• Maintain or enhance an economically valuable supply of commercial timber from British Columbia's forests, and ensure that delivered wood costs are competitive
Wildlife	• Conserve sufficient wildlife habitat and retain wildlife trees
Riparian Ecosystems	• Conserve, at the landscape level, the water quality, fish habitat, wildlife habitat and biodiversity associated with those riparian areas
Resilience to Disturbance	• Create ecosystem resilience to forest disturbances (i.e. wildfire, drought, insects and diseases, forest pests, etc.)
Soils	• Conserve the productivity and hydrologic function of soils
Fish & Riparian Values	• Prevent the cumulative hydrological effects of primary forest activities in the fisheries sensitive watershed from resulting in a material adverse impact on the habitat of the fish species
Community Watershed	• Prevent the cumulative hydrological effects of primary forest activities within the community watershed from resulting in: ○ (a) a material adverse impact on the quantity of water or the timing of the flow of the water to the waterworks, or ○ (b) the water from the waterworks having a material adverse impact on human health that cannot be addressed by water treatment
Biodiversity Landscape	• Design areas on which timber harvesting is to be carried out that resemble, both spatially and temporally, the patterns of natural disturbance that occur within the landscape
Cultural Heritage	• Conserve, or, if necessary, protect cultural heritage resources that are the focus of a traditional use by an aboriginal people that is of continuing importance to that people
Plant Communities	• Conserve forage and associated plant communities

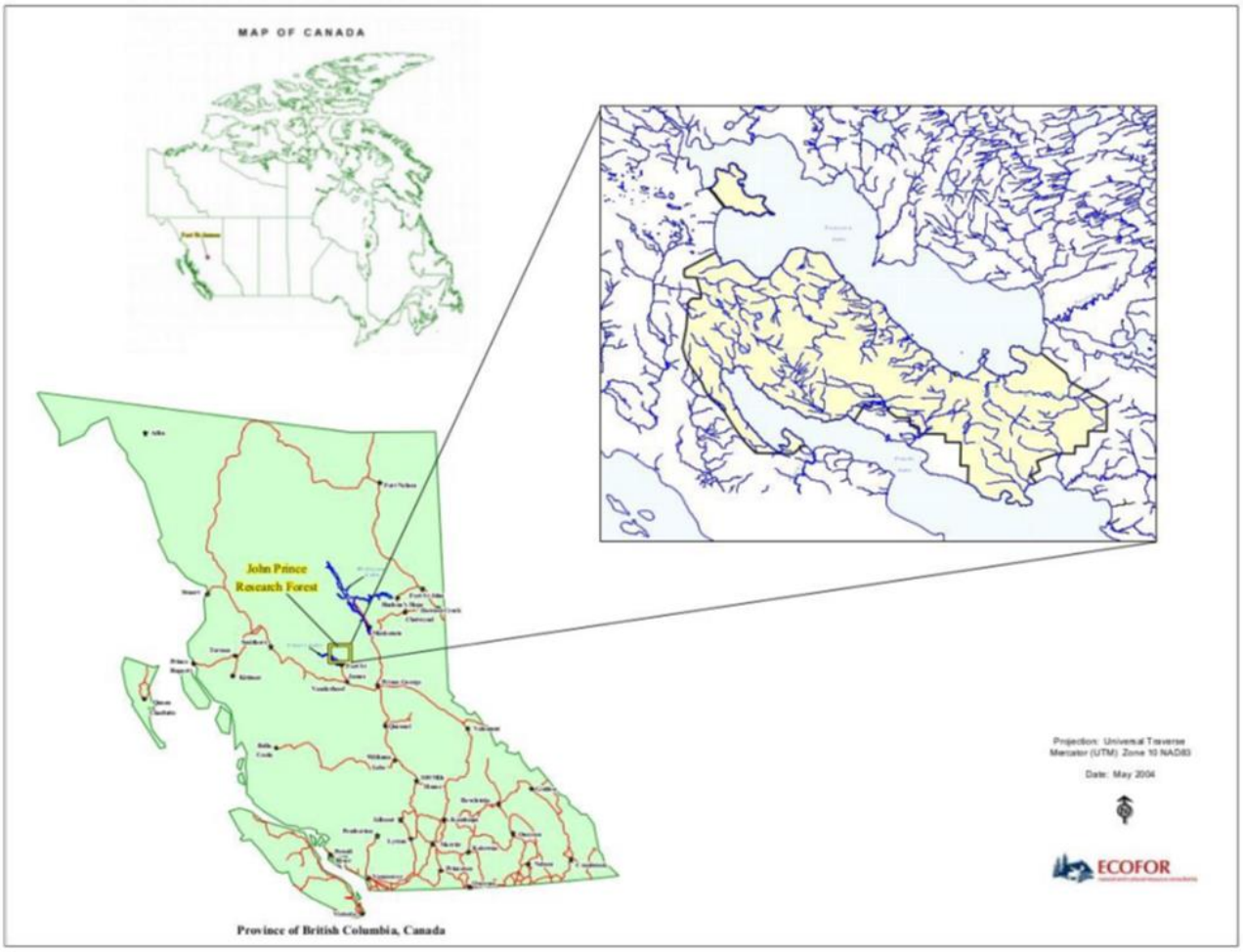


Figure 1. John Prince Research Forest Location

Sub-Boreal Spruce Forests – Future Climate Scenarios

Temperature:

Both summer and winter temperatures are projected to increase in the Sub-Boreal Spruce region of BC in the coming decades.

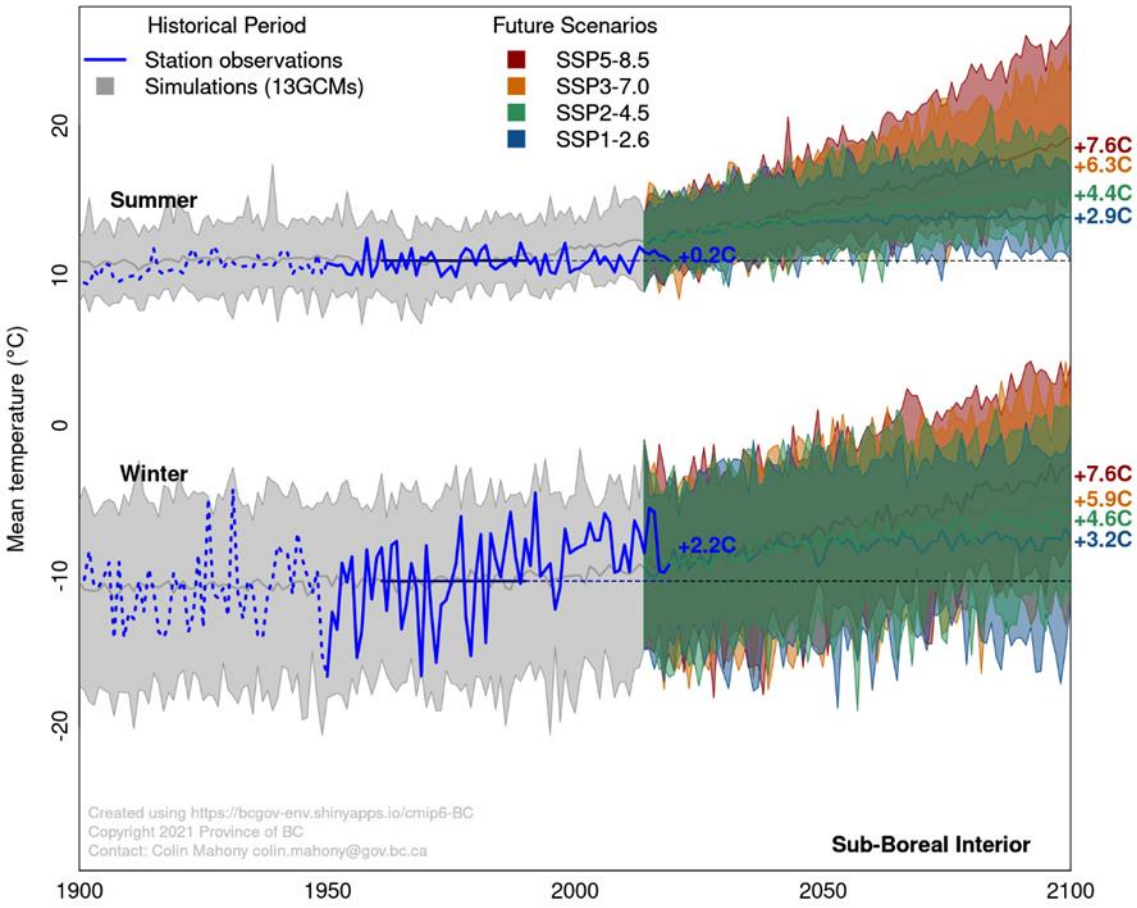


Figure 2. Projected future summer and winter temperatures for Sub-Boreal Spruce region of BC

(Credit: Colin Mahony, BC MFLNRORD)

Precipitation:

Both summer and winter precipitation amounts are projected to increase in the Sub-Boreal Spruce region of BC in the coming decades.

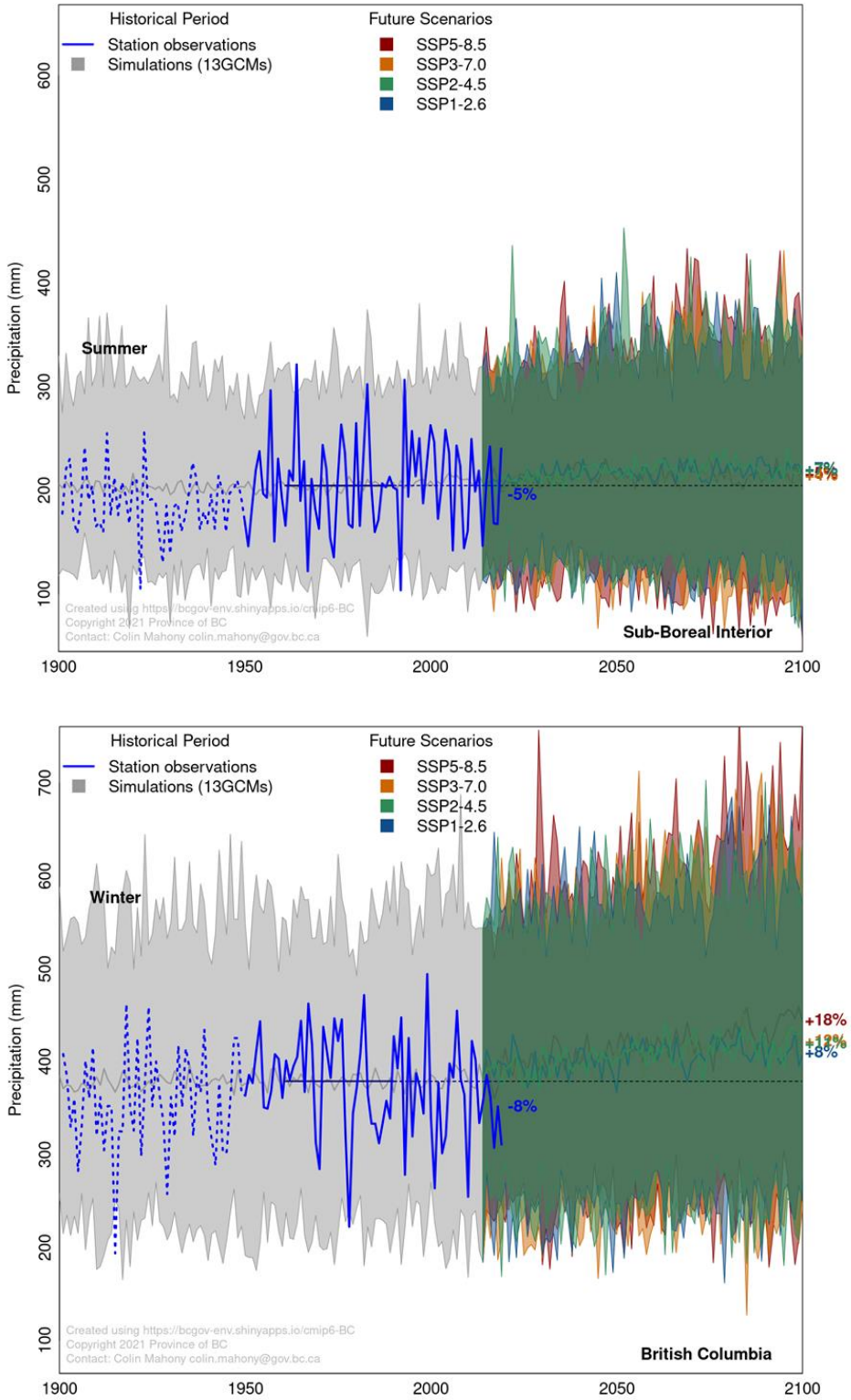
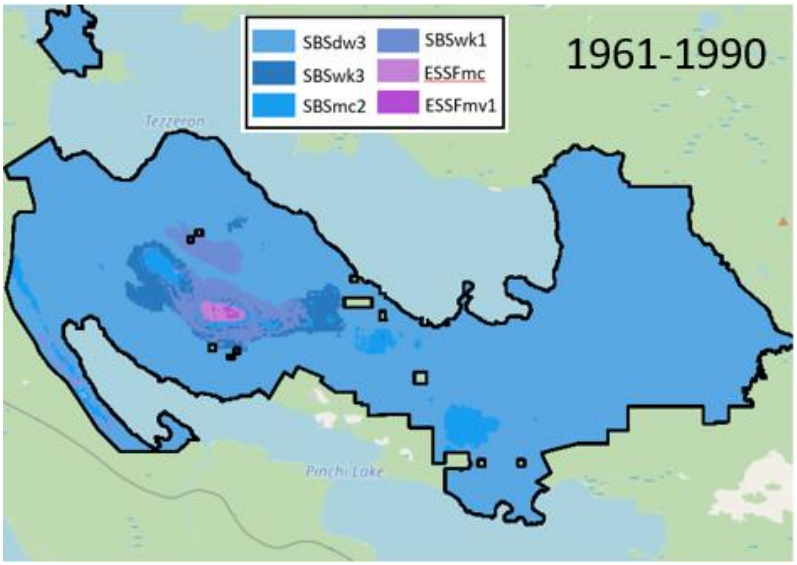


Figure 3. Projected future summer and winter temperatures for Sub-Boreal Spruce region of BC

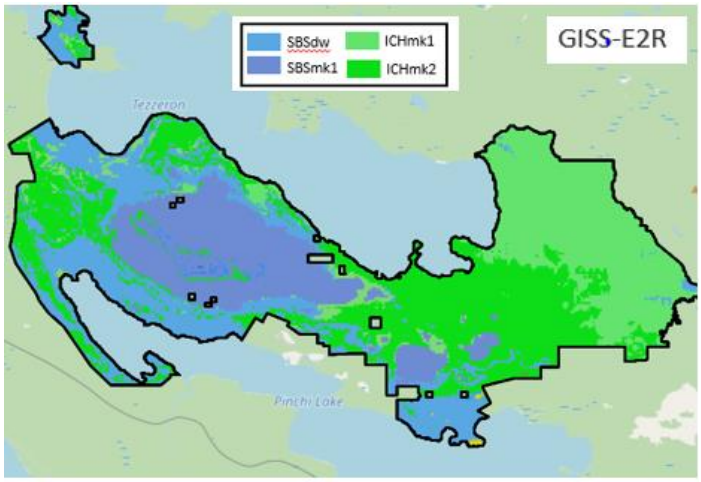
(Credit: Colin Mahony, BC MFLNRORD)

John Prince Research Forest Biogeoclimatic Subzone/Variants – Projected Changes:

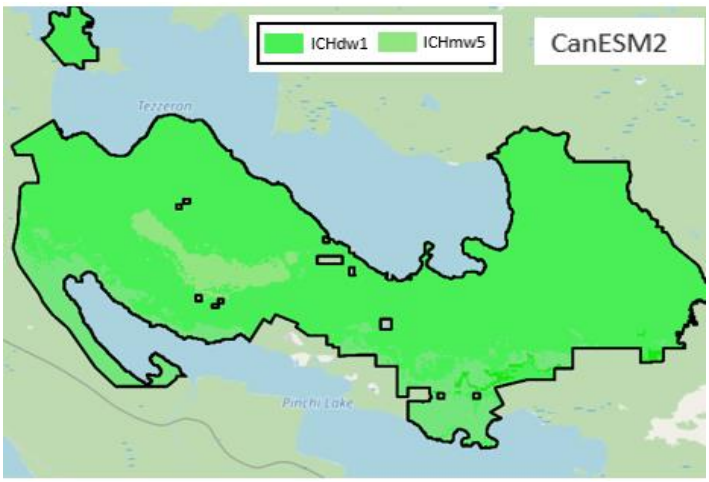
Historic/current conditions:



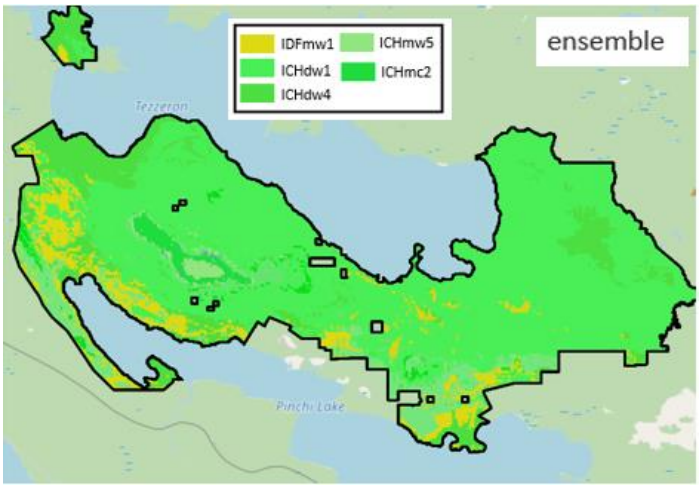
"A little warmer" scenario:



"Warmer & moister" scenario:



"Middle of the road" scenario:



"Hotter & drier" scenario:

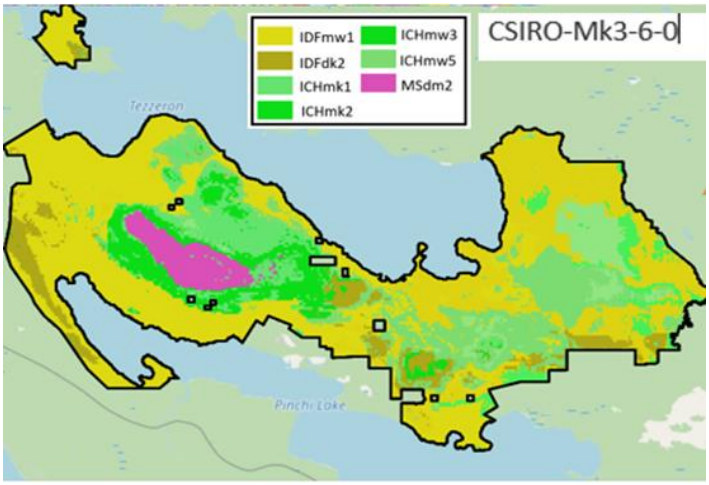


Figure 4. Current and projected future (2041-2070, RCP 4.5) distribution of Biogeoclimatic subzone/variants under different climate change scenarios

(Credit: Colin Mahony, BC MFLNRORD)

References for Climate Projections:

Shiny application (R package) used to create projections for JPRF:

https://bcgov-env.shinyapps.io/ccsummary-JohnPrinceRF/

Shiny application used to create projections for Prince George Region (provides larger perspective for projections):

https://bcgov-env.shinyapps.io/ccsummary-PrinceGeorge/

Forest Ecology and Management publication "An ecological approach to climate change-informed tree species selection" that describes how the projections were developed, including information about species reforestation feasibility:

https://www.researchgate.net/profile/Colin-Mahony/publication/345634719_An_ecological_approach_to_climate_change-informed_tree_species_selection_for_reforestation/links/5fa98d28a6fdcc062420460a/An-ecological-approach-to-climate-change-informed-tree-species-selection-for-reforestation.pdf