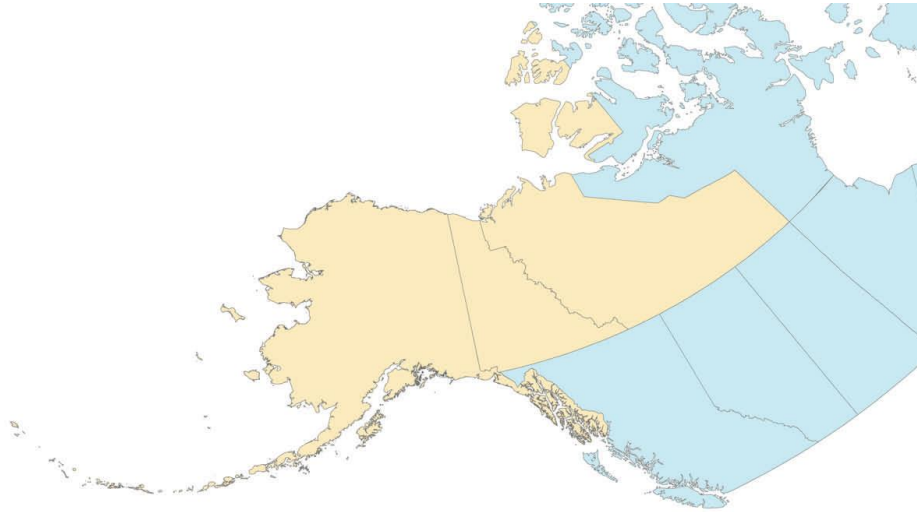


Results summary of “Predicting Future potential Climate-Biomes for the Yukon, Northwest Territories, and Alaska”



The following is a summary of a completed study that mapped the predicted ecosystem changes that would occur in the NWT and Alaska (not shown) due to warming temperatures associated with climate change. Three scenarios, based on global greenhouse gas emissions, were studied; a low temperature increase, an average temperature increase, and a high temperature increase. The results were overlain on a map of the NWT, and these maps are presented in this summary. For more information on the study and its methodology, please refer to the full report completed by the Scenarios Network for Arctic Planning and the EWHALE lab, University of Alaska Fairbanks.

Prepared on behalf of:
The Nature Conservancy’s Canada Program
Arctic Landscape Conservation Cooperative
The US Fish and Wildlife Service
Ducks Unlimited Canada
Government of Canada
Government of the Northwest Territories



2012

Summarized below are the results of the study “Predicting Future potential Climate-Biomes for the Yukon, Northwest Territories, and Alaska”. This study aimed to predict how climate change would impact the biomes (ecosystems) of the NWT. This study uses historic weather data and five different climate models to predict future precipitation and temperature regimes. By comparing the resulting models against other precipitation and temperature averages from biomes found across Canada and Alaska, researchers were able to forecast how these changing weather regimes would affect biomes in the NWT. A Global high-, medium – and low-emission rate show various impacts based on how quickly and efficiently the global community reacts to climate change. The methodology of the complete study is available at: <http://www.nwtclimatechange.ca/content/resources-0>.

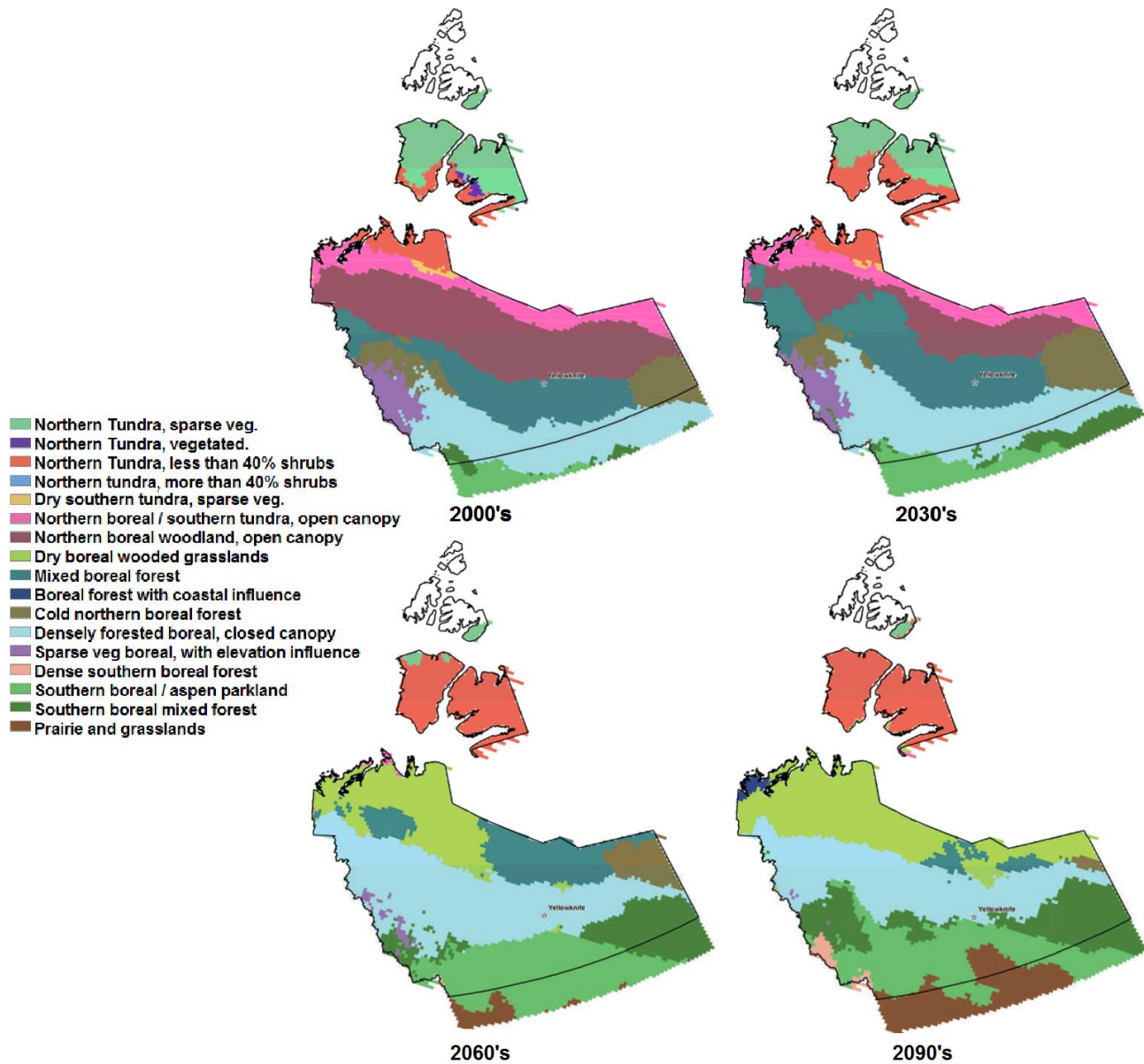


Figure 1: This projection shows the results of a temperature increase in the NWT due to medium global greenhouse gas emissions, based on a composition of five different climate models. The NWT is shown at 10 minute latitude/longitude resolution.

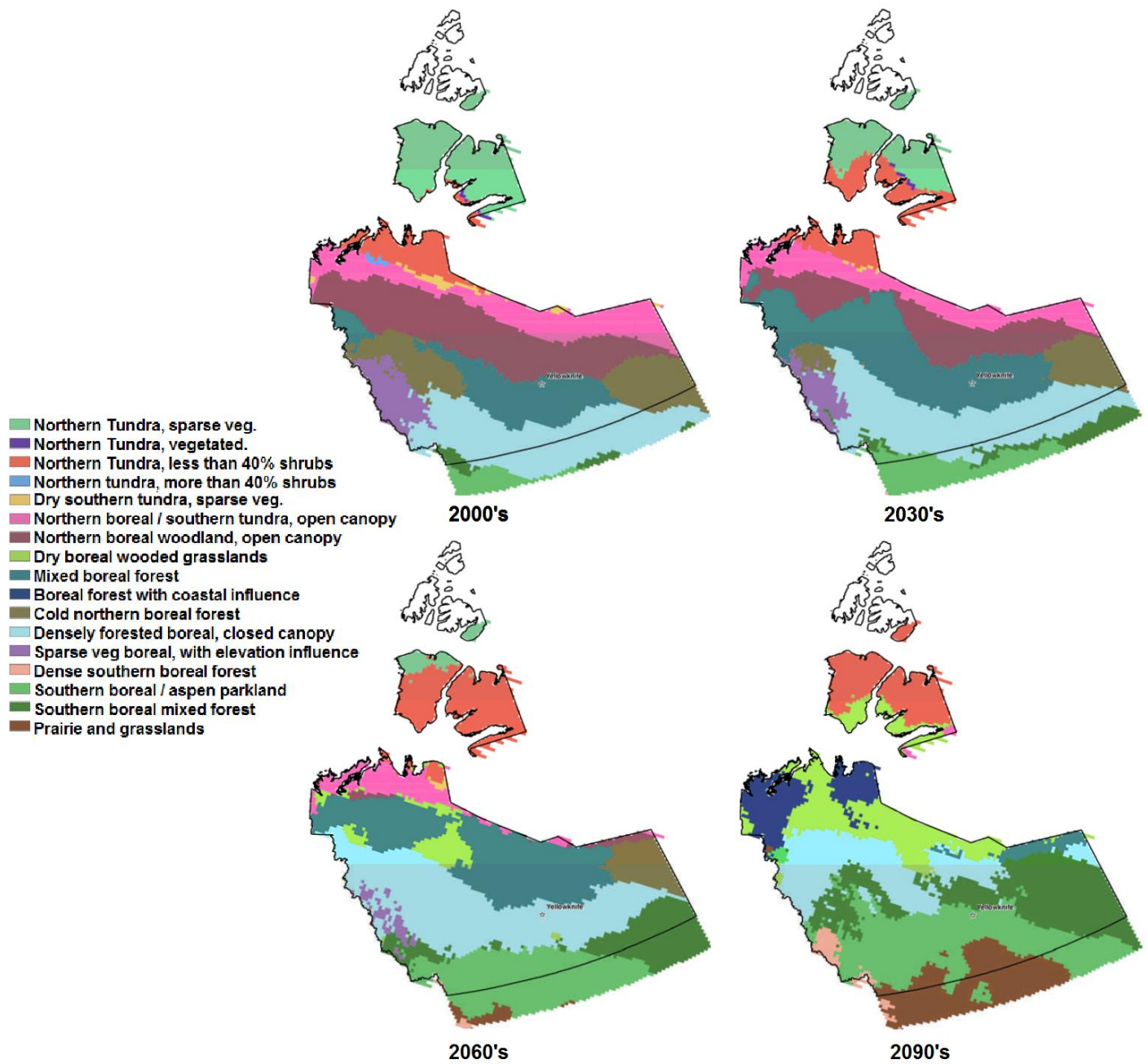


Figure 2: This projection shows the results of a temperature increase in the NWT due to high global greenhouse gas emissions, based on a composition of five different climate models. The NWT is shown at 10 minute latitude/longitude resolution.

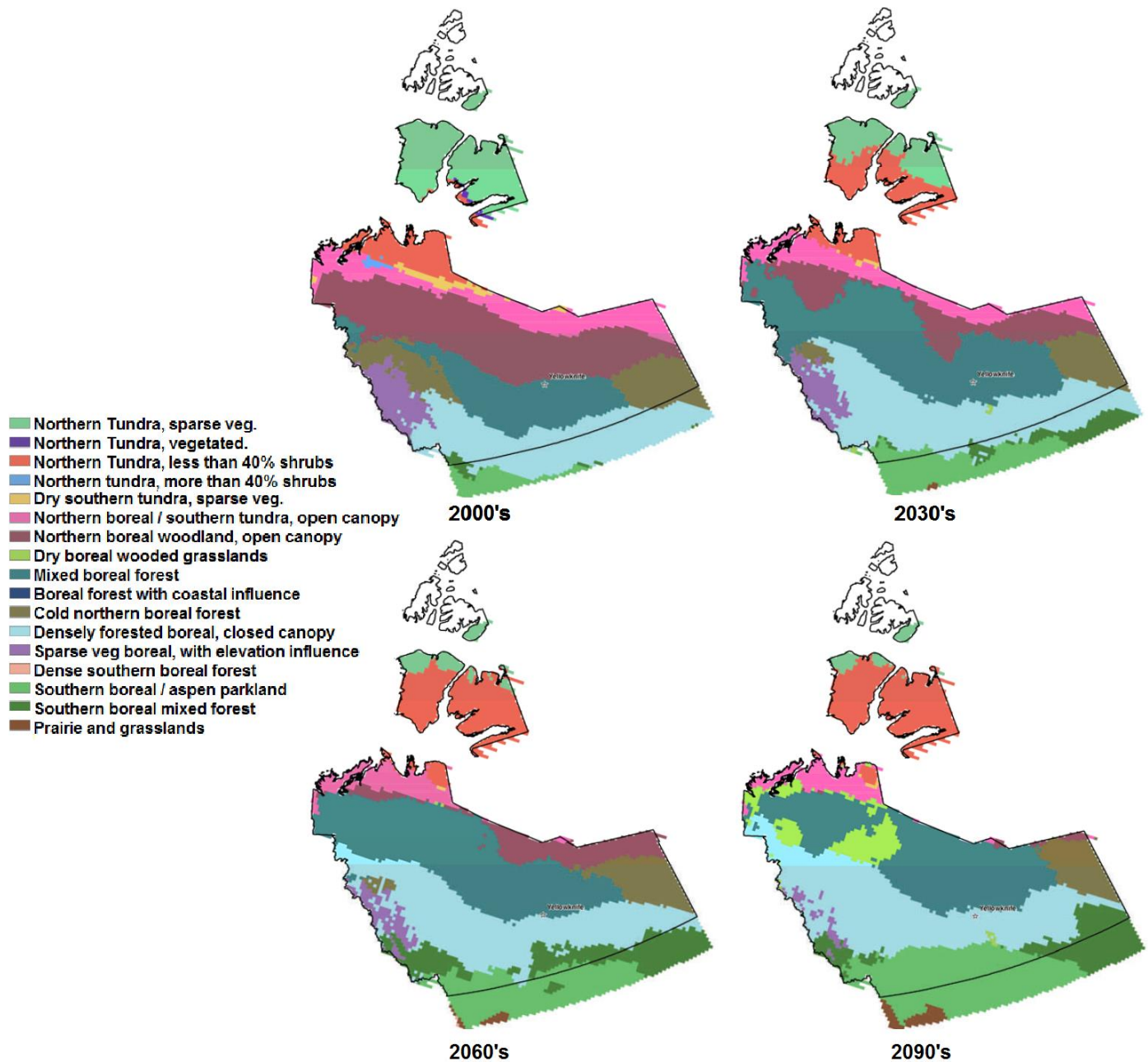


Figure 3: This projection shows the results of a temperature increase in the NWT due to low global greenhouse gas emissions, based on a composition of five different climate models. The NWT is shown at 10 minute latitude/longitude resolution.

Conclusions:

The immense changes to the NWT biomes are obvious throughout all three of the scenarios. In all three scenarios, boreal and arctic biomes shift north and most shrink in size, as southern biomes encroach on them.

Please note that these predicted biome shifts will be slow, gradual processes, as fauna and, especially, flora take time to convert from one biome to another, despite the new temperature and precipitation regimes that have moved into the area. In many cases, biome shifts may be limited by characteristics other than temperature and precipitation, such as seed dispersal or soil composition.

Southern boreal mixed forest ecosystem moves into the southern parts of the NWT, even with low emissions and low temperature increases. The South Slave and Deh Cho regions will experience pressures on their boreal forests as deciduous trees begin to outcompete the coniferous forests native to the areas.

Prairie grasslands, similar to those found in central or southern Alberta, begin to move into the South Slave at high and medium global emission rates.

Various types of tundra, found in the northern parts of the NWT, decrease in all projections, as permafrost thaws and coniferous trees encroach on these habitats. By the end of these projections, the majority of mainland tundra can support large shrubs and trees. By the end of the 21st century, tundra with limited vegetation and shrubbery is found only on the Canadian Arctic Archipelago.