HISTORICAL AND FUTURE GROWTH OF HYBRID POPLAR SHELTERBELTS IN SASKATCHEWAN

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We wanted to better understand how shelterbelt trees will grow in the future based on how they have already grown on the landscapes in the past. To do so, we sampled 125 shelterbelt locations across Saskatchewan covering the six dominant shelterbelt tree species, and covering a spatial network across all of southern Saskatchewan.

ALL TREE SPECIES

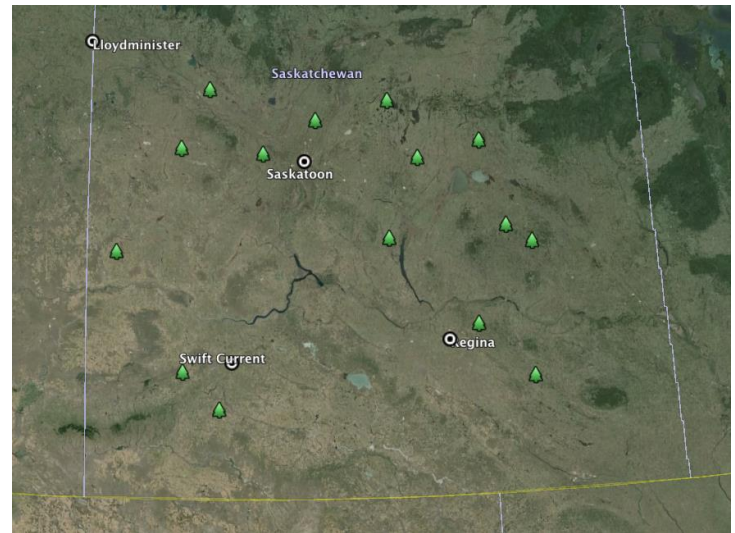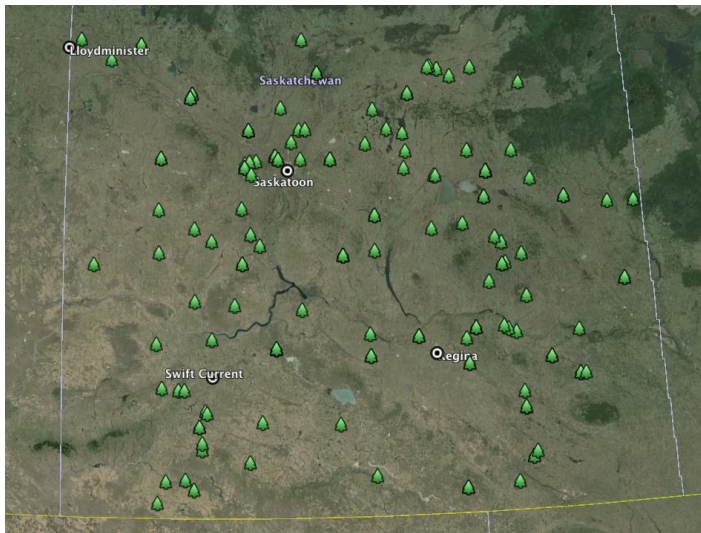Figure 1: Locations where all six different tree species were sampled in southern Saskatchewan.

THE HYBRID POPLAR SPECIES

Figure 2: Locations where all of the hybrid poplar species were sampled in southern Saskatchewan.

CLIMATOLOGICAL LIMITING FACTORS

The most common climatological limiting factors that drive the radial growth of hybrid poplar trees in order of importance across the southern part of the province are:

Current year July Precipitation;

Current year May and June precipitation and;

Current and Past year September temperatures.

From these data we get a better understand that hybrid poplar is dominated by moisture signals during the growth year when it is warm. When it gets good moisture and it is actively producing its rings it does well. Most important is for it to get good moisture in July during the warmest part of the growth season, and next good moisture during the spring. Lastly, if is gets warm temperatures at the end of the growth year, it can extend its growth year and help the species produce sugars for initiating growth the following year. Conversely, if does not receive good moisture during these key times, or if it is a cool September, it will produce a small or very small growth ring in that given or next year.
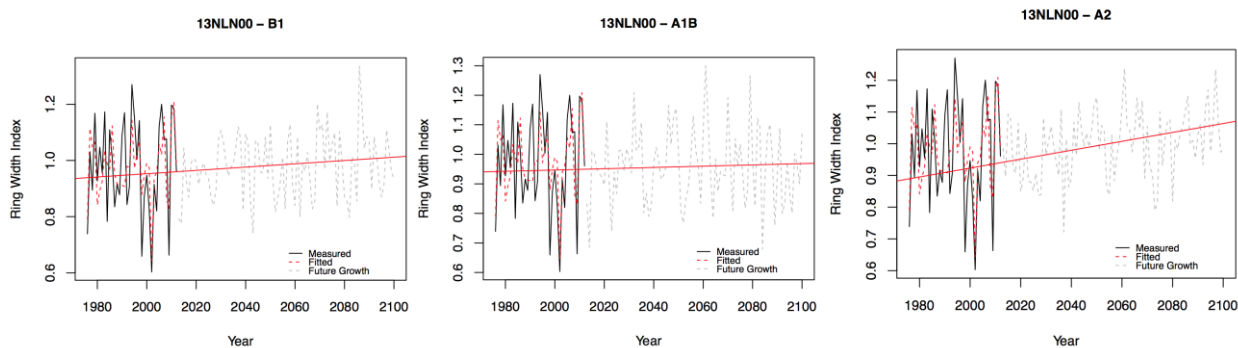
Figure 3a-c: An example of past (black lines) and modelled future growth (dashed lines) from a hybrid poplar site near Yorkton Saskatchewan. The three future scenarios illustrate low (B1), medium (A1B) and high (A2) simulated CO2 emission scenarios. The red line indicates the overall long-term trajectory of radial growth for hybrid poplar.

TRAJECTORIES ACROSS PROVINCE

Of the 12 hybrid poplar locations modelled, most of the scenarios illustrated a neutral or positive upward trajectory into the future in all areas of southern Saskatchewan. The projected hotter and similar moisture conditions in the future for all of southern Saskatchewan are ideal conditions to grow hybrid poplar. As one moves northward in the province, the radial growth in general remains in the same at these higher latitudes, as these areas are projected to have less moisture deficits as they will experience less extremes in heat.

INDIVIDUAL MODELLING LOCATIONS

For more specific information on future forecasted growth for each species in specific locations in Saskatchewan, please visit our radial growth model at:
http://madlabsk.ca/model2/externaldata_3.html

OTHER FACTSHEETS IN THE SERIES

Specific analysis on most of the locations in the study can be found on our web site at
http://www.madlabsk.ca/ and http://www.madlabsk.ca/reports.html

CONTACT FOR MORE INFORMATION: SASKAGROFORESTRY.CA/

ACKNOWLEDGEMENTS & COPYRIGHT

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