



AGGP-Agroforestry

No. SASK-28

HISTORICAL AND FUTURE GROWTH OF GREEN ASH 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

THE GREEN ASH SPECIES

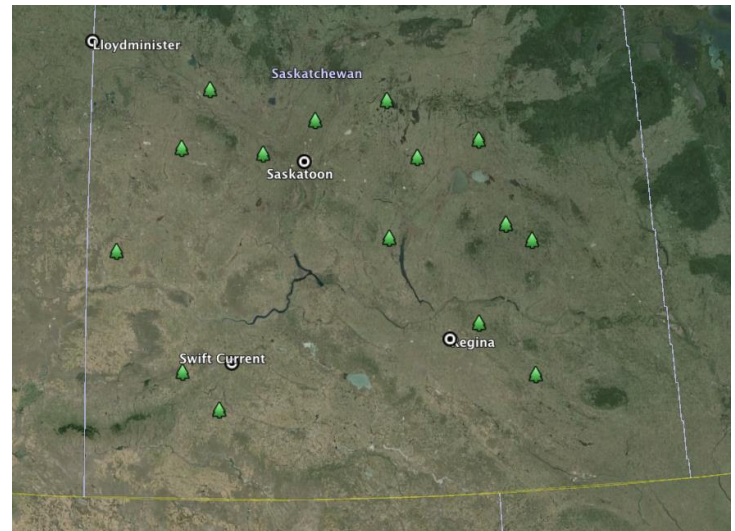
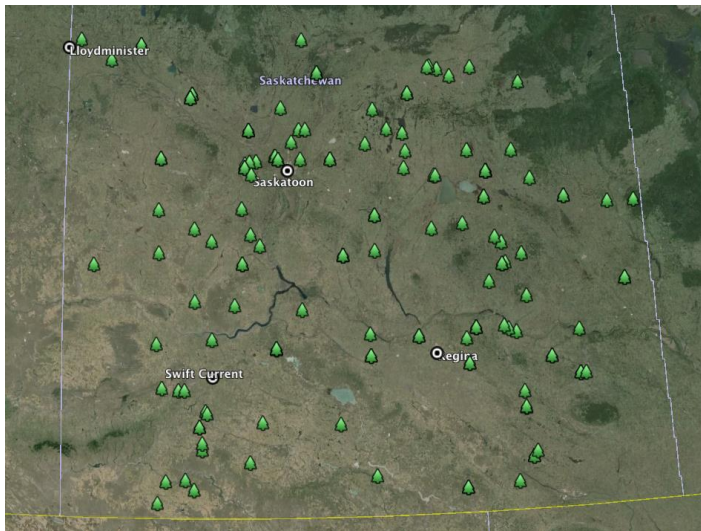


Figure 1: Locations where all six different tree species were sampled in southern Saskatchewan.

Figure 2: Locations where all of the green ash species were sampled in southern Saskatchewan.

CLIMATOLOGICAL LIMITING FACTORS

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

- Current-year June Precipitation;
- Current-year May precipitation and;
- Current-year October temperature.

From these data we get a better understand that green ash is dominated by moisture signals early in its growth year. When it gets good moisture and it is actively producing its rings in June it does well. It also prefers good moisture in May when it is leafing out. Lastly, if it 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 May and June, or if it is a cool October, it will produce a small or very small growth ring in that given or next year.



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AN EXAMPLE OF GREEN ASH MODELLED FUTURE GROWTH

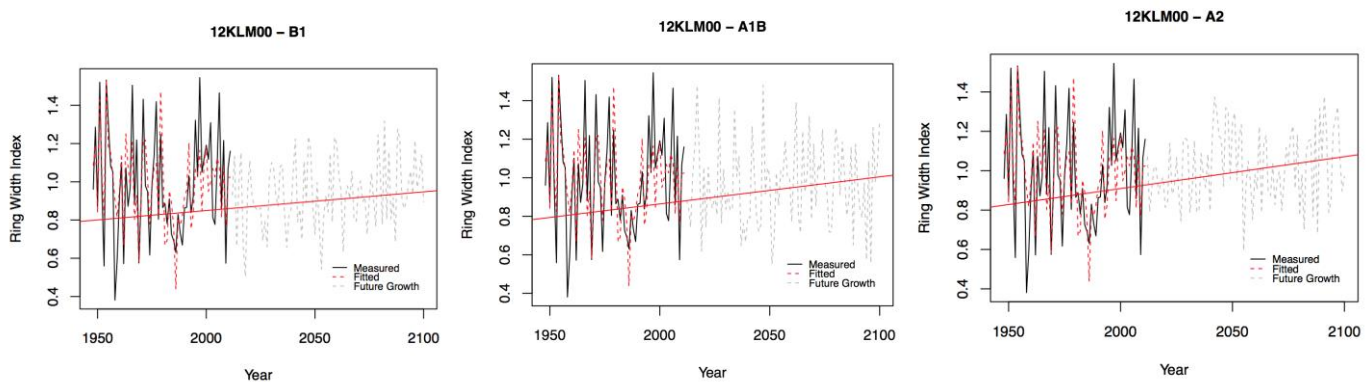


Figure 3a-c: An example of past (black lines) and modelled future growth (dashed lines) from a green ash site near Weyburn Saskatchewan. The three future scenarios illustrate low (B1), medium (A1B) and high (A2) simulated CO₂ emission scenarios. The red line indicates the overall long-term trajectory of radial growth for green ash.

TRAJECTORIES ACROSS PROVINCE

Of the 15 green ash 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 green ash. As one moves northward in the province, the radial growth in general decreases at these higher latitudes, as these areas are projected to have less moisture deficits, as they will experience fewer 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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