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Helping Forests Gain Ground On Climate Change

May 15, 2013 — University of Alberta researchers have developed guidelines that are being used by the timber industry and government foresters to get a jump on climate change when planting trees.

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Maps developed by Laura Gray, a post-doctoral fellow in the Department of Renewable Resources at the U of A, provide projections of climatically suitable habitat for tree species based on climate predictions for the 2020s, 2050s and 2080s.

Currently, Alberta forestry companies and government agencies plant 80 million spruce, fir and pine seedlings to reforest more than 50,000 hectares

of harvested land annually.

"The information helps forest managers have more confidence in their decisions on what and where to plant. It allows them to more accurately assess the climatic risk," said Gray, co-author of the study with associate professor Andreas Hamann.

The study addresses concerns that many populations of wide-ranging tree species, which are adapted to local growing conditions, may now or in the future actually lag behind their optimal growing environment because of changing temperature and precipitation conditions. The work is the first of its kind to tackle multiple potential climate scenarios for a large number of tree species across western North America.

Gray's large-scale research, which considers 15 major commercial tree species and 18 different future climate-change scenarios, was recently published in the journal *Climatic Change*.

The U of A study also considers patterns of climate change observed from the 1970s until recently. The researchers found that on average, populations already lag behind their best climate niche by 130 kilometres in latitude or 60 metres in elevation.

Gray and Hamann's study has produced several maps and tables that document recent species habitat shifts and predict future ones. Generally, Gray said, forest managers should consider using seed from more southern climates or lower elevation environments. The seed should still be of the same tree species, rather than introducing a new species into a foreign environment, she added.

Foresters in British Columbia have started using the study's results as one of the tools to aid assisted seed migration strategies, Gray noted.

The study's findings help "inform and effect change in reforestation policy, so that those efforts can be leveraged to improve resilience and productivity of Alberta's forests under changing climate," Hamann said.

The study was funded by the Natural Sciences and Engineering Research Council of Canada, the Alberta Forestry Research Institute, and industry partners Alberta-Pacific Forest Industries, Ainsworth Engineered Canada LP, Daishowa-Marubeni International Ltd., Western Boreal Aspen Corporation and Weyerhaeuser Company Ltd.

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Journal Reference:

1. Laura K. Gray, Andreas Hamann. **Tracking suitable habitat for tree populations under climate change in western North America.** *Climatic Change*, 2012; 117 (1-2): 289 DOI: [10.1007/s10584-012-0548-8](#)

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