Radial-growth forecasts of five conifers in southeastern New Brunswick

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Although many accept predictions that our climates are changing rapidly, very little empirical work has been conducted that gives specific information on how these changes will affect natural systems. In nature, with past climate changes, certain species often became winners, while others losers.

This project developed radial-growth forecasts for five of the most ecologically and economically relevant conifer species as chosen by regional stakeholders in southeastern New Brunswick. Using dendrochronology the five species were sampled and their radial growth increments were developed into master chronologies for each species. Regression models were then constructed using local historical monthly weather data to ascertain which factors were important to tree growth in the past. R^2 relationships indicate that the models that were developed explained a large portion of the variance in past growth (0.68 to 0.79), and so Coupled Global Climate Model (CGCM) data was used to forecast how each tree species will react to future climates.

The models reveal the direction of natural adaptation by the studied conifer species to predicted future climates, and indicate that our forests will begin to shift species composition from a spruce/fir dominated forest back to a pine/hemlock forest. This type of forest has not been dominant in our region since the Hypsothermal approximately 4–7 ka BP. This information advances our knowledge of the potential changes in forest composition, and gives specific reasons on how each species would react to predicted climatic change.