NE Forests 2100

Understanding the Impacts of Climate Change on Northeastern Forests

Global climate change has emerged as one of the most important environmental and policy issues of the 21st century. As such, there is an urgent need to continue to build a sound scientific basis for national and international policies regulating carbon sequestration and greenhouse gas emissions. Towards this end, **NE Forests 2100** was established in 2006. **NE Forests 2100** is a coalition of U.S. and Canadian environmental scientists whose goal is to synthesize current scientific information on the impacts of historic and projected regional climate change on forested ecosystems of the northeastern U.S. and eastern Canada, and to make this information available to policymakers, land managers, and the concerned public.

Results from the **NE Forests 2100** synthesis showed unequivocally that both temperature and precipitation have increased across the region over the last century, with associated changes in snow and hydrologic regimes. Model predictions indicate that temperature and precipitation will continue to increase over the next century. Changes in the timing of precipitation, coupled with greater annual evapotranspiration associated with earlier spring and later autumn, will paradoxically contribute to increased frequency and intensity of droughts. These changes, particularly in association with other anthropogenic influences (e.g., increases in atmospheric CO_2, acid deposition, and tropospheric ozone concentrations) will have profound direct and indirect effects on forest productivity and tree species composition, "nuisance species" (including pests, pathogens, and invasive species), wildlife, and forest nutrient cycling. Complex life histories and a cascade of feedbacks between ecosystem components may even overwhelm direct climatic effects, creating lags and thresholds in response, and potentially lead to sudden large shifts in forest ecosystem health, productivity and the goods and services that these forests offer.

NE Forests 2100 results have been published as a collection of papers in The Canadian Journal of Forest Research (Volume 39, Number 2, February 2009: 199-284). They are as follows:

Rustad LE, Campbell JL, Cox, RM, DeBlois M, Dukes JS, Huntington TJ, Magill AH Mohan JE, Pontius J, Richardson AD, Rodenhouse NL, Watson MR, and Willard N. 2009. NE Forests 2100: A Synthesis of

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Huntington TG, Richardson AD, McGuire KJ, Hayhoe K. 2009. Climate and Hydrological Changes in the Northeastern United Sates: Recent Trends and Implications for Forested and Aquatic Ecosystems. Canadian Journal of Fores Researcht 39: 199-212.

Mohan JE, Cox RM, Iverson LR. 2009. Northeastern Forest Composition and Productivity in a Future, Warmer World. Canadian Journal of Forest Research 39: 213-230.

Dukes JS, Pontius J, Orwig D, Garnas JR, Rodgers VL, Brazee N, Cooke B, Theoharides KA, Stange EE, Harrington R, Ehrenfeld J, Gurevitch J, Lerdau M, Stinson K, Wick R, and Ayres M. 2009. Responses of pests, pathogens and invasive species to climate change in the forests of northeastern North America: What can we predict? Canadian Journal of Forest Research 39: 231-248.

Rodenhouse NL, Christenson LM, Parry D, Green LE. 2009. Climate Change Effects on Native Fauna of Northeastern Forests. Canadian Journal of Research 39: 249-263.

Campbell JL, Rustad LE, Boyer EW, Christopher SF, Driscoll CT, Fernandez IJ, Groffman PM, Houle D, Kiekbusch J, Magill AH, Mitchell MJ, and Ollinger SV. 2009. Consequences of Climate Change for Biogeochemical Cycling in Forests of Northeastern North America. Canadian Journal of Forest Research 39: 264-284.

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