

Forestry Breakout Session

Projections for the next century suggest climate change will have important impacts on Washington State's economy and natural resources. In order to both control the costs and maximize the benefits of a changing climate, we must begin preparing now. To stimulate discussion in this session, we **summarize projected climate impacts from the conference white paper**, **enumerate previously suggested adaptation strategies**, and **provide case studies to illustrate planning techniques, vulnerabilities, and/or opportunities**.



Prepared by Jennifer Kay, Joe Casola, Amy Snover, and the Climate Impacts Group (CIG) at the University of Washington for King County's October 27, 2005 Climate Change Conference.

Summary of projected climate change impacts on forestry

Tree species may migrate or have trouble adapting. Direct impacts of climate change could force migration of some tree species to higher elevations and latitudes, while other species may be unable to adapt to changing climate conditions.

Increased threat of fire and insect outbreaks. Rising temperatures could indirectly impact forests by creating more favorable conditions for fire and insect outbreaks.



Credit: Norm Johnson, USDA Forest Service, www.forestryimages.org

Doug fir beetle in wind throw, Gifford Pinchot National Forest, WA

Adaptation discussion starters

Guiding principles for planning:

1. Recognize that the past may no longer be a reliable guide to the future.
2. Integrate climate change projections into all planning processes.
3. Monitor regional climate and resources for ongoing change.
4. Expect surprises. Design policies and management practices to be flexible to changing conditions.

Could these strategies help Washington prepare for change?

Maintain genetic and species biodiversity and minimize forest fragmentation to allow species migration.

For timber harvest, plant tree species (or genotypes) known to have a broad range of environmental tolerance.

For example: may need to switch from Douglas Fir trees which are relatively sensitive to low soil moisture to more drought-resistant timber species.

Incorporate understanding of elevation-specific climate sensitivities into management strategies.

Manage forests understanding changing fire risk. Minimize development in vulnerable fire regimes.

Monitor and control insects and invasive species. Be prepared for insects and invasive species to both expand their current range and increase their number of lifecycles.

Sources: 1) Snover, A., Miles, E. and B. Henry, OSTP/USGCRP Regional Workshop of the Impacts of Global Climate Change on the Pacific Northwest Annex D, NOAA Climate and Global Change Program, Special Report Number 11, 1997. 2) Innes, J. L., and D. L. Peterson, Proceedings introduction: Managing forests in a greenhouse world – context and challenges. Proceedings of the Climate Change, Carbon and Forestry in Northwestern North America Workshop held November 13-14, 2001. United States Department of Agriculture, Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-614, April 2004.

Opportunity case study - Develop management systems to sequester carbon:

In Western Washington, one study¹ suggests 110 million tons of carbon could be sequestered over a 50-year period in riparian areas set aside by the Forest and Fish Rules alone. Assuming an average value of carbon sequestration at \$2 a ton, \$240 million dollars in revenue would be generated. Credits for carbon sequestration can be obtained from trading systems such as the Chicago Climate Exchange (More information and current carbon prices at: <http://www.chicagoclimatex.com/>).

¹Perez-Garcia, J., Edelson, J., and H. Rogers, Economic incentives for carbon storage in Western Washington's forested riparian management areas. Proceedings of the Climate Change, Carbon and Forestry in Northwestern North America Workshop held November 13-14, 2001. United States Department of Agriculture, Forest Service, Pacific Northwest Research Station, General Technical Report, PNW-GTR-614, April 2004.

Planning case study – Balancing fire risk and carbon sequestration:

A planning study¹ for the Okanogan and Freemont National Forests simulated fire risk reduction, economic cost, habitat protection, and carbon sequestration for a range of thinning strategies. Without wildfires, the no-action alternative results in the greatest comparative storage of carbon. However, fire would release all of the stored carbon and is a likely outcome without fuel reduction treatment. By balancing the costs and benefits of thinning, the study identified management plans that could both reduce fire risk and allow a high level of carbon sequestration.

¹Mason, C. L., Cedar, K., Rogers, H., Bloxton, T., Connick, J., Lippke, B., McCarter, J., and K. Zobrist. Investigation of alternative strategies for design, layout and administration of fuel removal projects. Rural Technology Initiative, College of Forest Resources, University of Washington, July 2003