Current Distribution of Forests in the United States

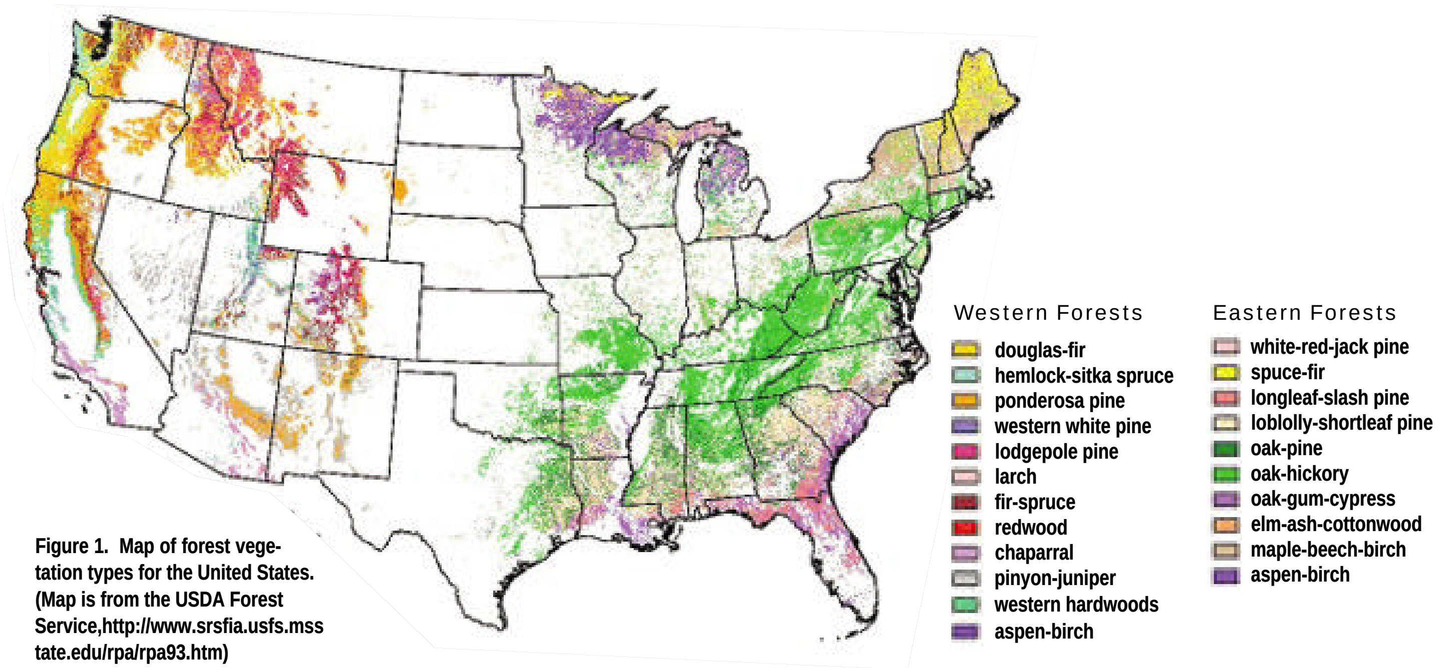

Figure 1. Map of forest vegetation types for the United States. (Map is from the USDA Forest Service,http://www.srsfia.usfs.msstate.edu/rpa/rpa93.htm)

Forest Land Coverage over the Past 400 Years

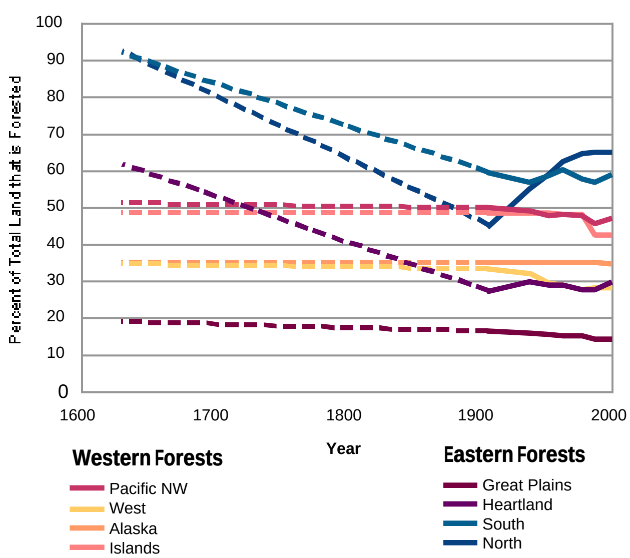

Figure 2. Land area changes in forestland. Data are from Forest Service Resource Bulletin PNW-RB-168, Forest Resource Report No. 23, No. 17, No. 14, the Report of the Joint Committee on Forestry, 77th Congress 1st Session, Senate Document No. 32. Data for 1850 and 1870 were based on information collected during the 1850 and 1870 decennial census; data for 1907 were also based on the decennial census modified by expert opinon, reported by R.S. Kellogg in Forest Service Circular 166. Data for 1630 were included in Circular 166 as an estimate of the original forest area based on the current estimate of forest and historic land clearing information. These data are provided here for general reference purposes only to convey the relative extent of the forest estate in what is now the US at the time of European settlement.

Biomass Consumed under Two Scenarios of Future Climate

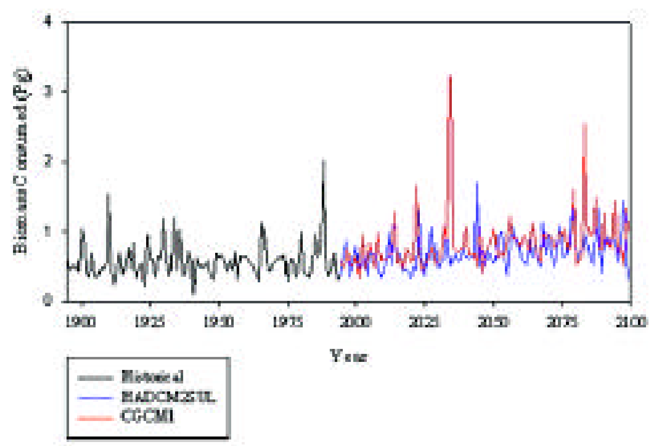

Figure 4. Simulated total biomass consumed by fire over the conterminous US under historic and two future climates; Hadley (HADCM2SUL) and Canadian (CGCM1) scenarios. The fire simulations are for potential vegetation and do not consider historic fire suppression activities. However, grid cells with more than 40% agriculture have been excluded from the calculations (Lenihan et. al., 1997, Daly et. al., 2000, Bachelet et. al., 2001).

Patterns of Live Vegetation for Different Times and Climate Scenarios

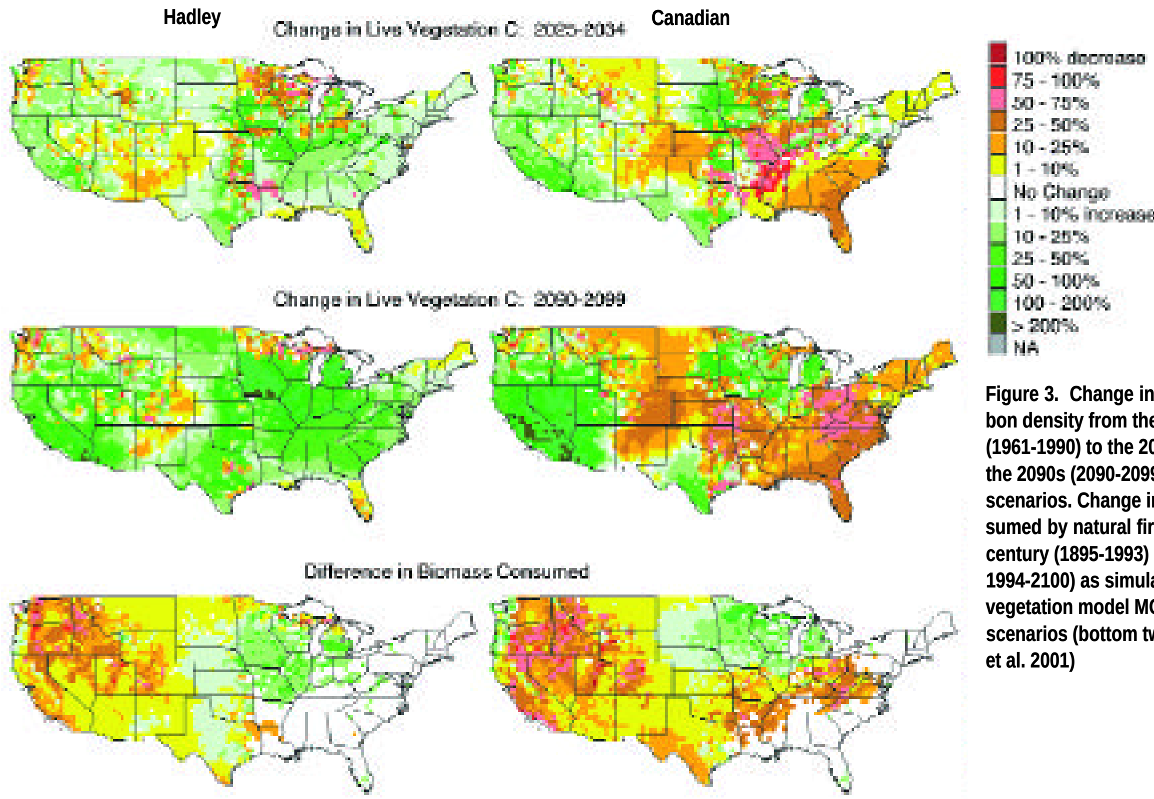

Figure 3. Change in live vegetation carbon density from the historical period (1961-1990) to the 2030s (2025-2035) and the 2090s (2090-2099) under two climate scenarios. Change in the biomass consumed by natural fires between the 20th century (1895-1993) and the 21st century 1994-2100) as simulated by the dynamic vegetation model MC1 under two climate scenarios (bottom two panels) (Bachelet et al. 2001)

Projected Changes in Distribution of Sugar Maple

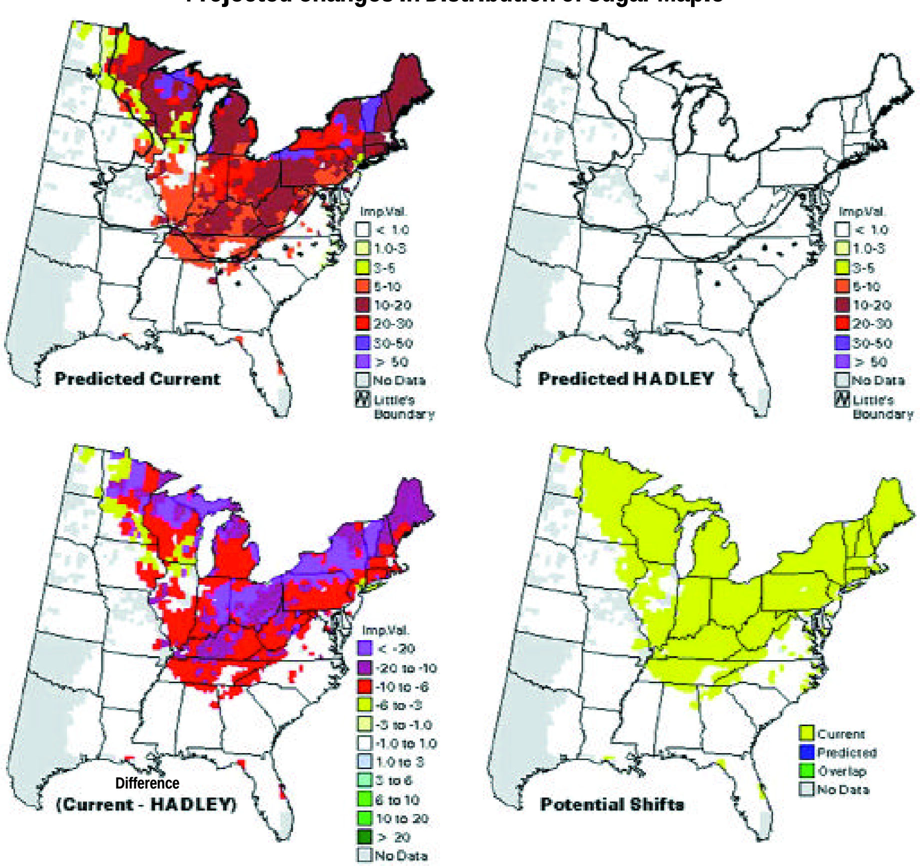

Figure 5. Projected distribution for sugar maple under current climate and the Hadley climate scenario and for the eastern United States, using statistical models developed by Iverson et al. (1999). The Predicted Current map is the current distribution and importance value of sugar maple, as modeled from the regression tree analysis. Importance value is an index based on the number of stems and basal area of both the understory and the overstory. Predicted Hadley is the potential suitable habitat for sugar maple under the Hadley climate scenario. These potential maps imply no barriers to migration. The Difference map represents the difference between Modeled Current and Predicted Hadley maps. The Potential Shifts map displays the modeled current distribution, along with predicted potential future distribution (using the Hadley scenario) and the overlap where the species is now and is projected to be in the future. As these maps indicate, very little sugar maple is likely to remain in the US by the late 21st century.

Current and Projected Forest Communities in the Eastern US

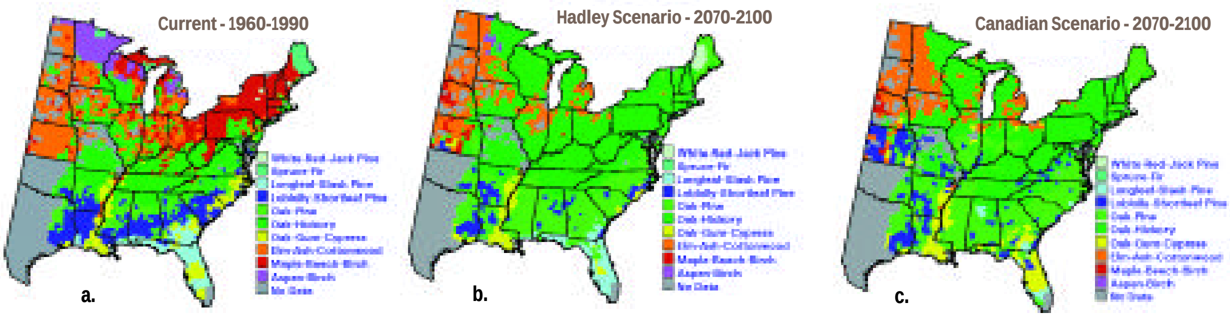

Figure 6. Projected forest communities under (a) current climate, (b) the Hadley climate scenario, and (c) the Canadian climate scenario, based on the results of individual analyses of 80 tree species shifts (see Prasad and Iverson, 1999-ongoing http://www.fs.fed.us/ne/delaware/atlas/index.html)

Paper Birch and Douglas Fir Tree Distributions under Future Climate Change Scenarios

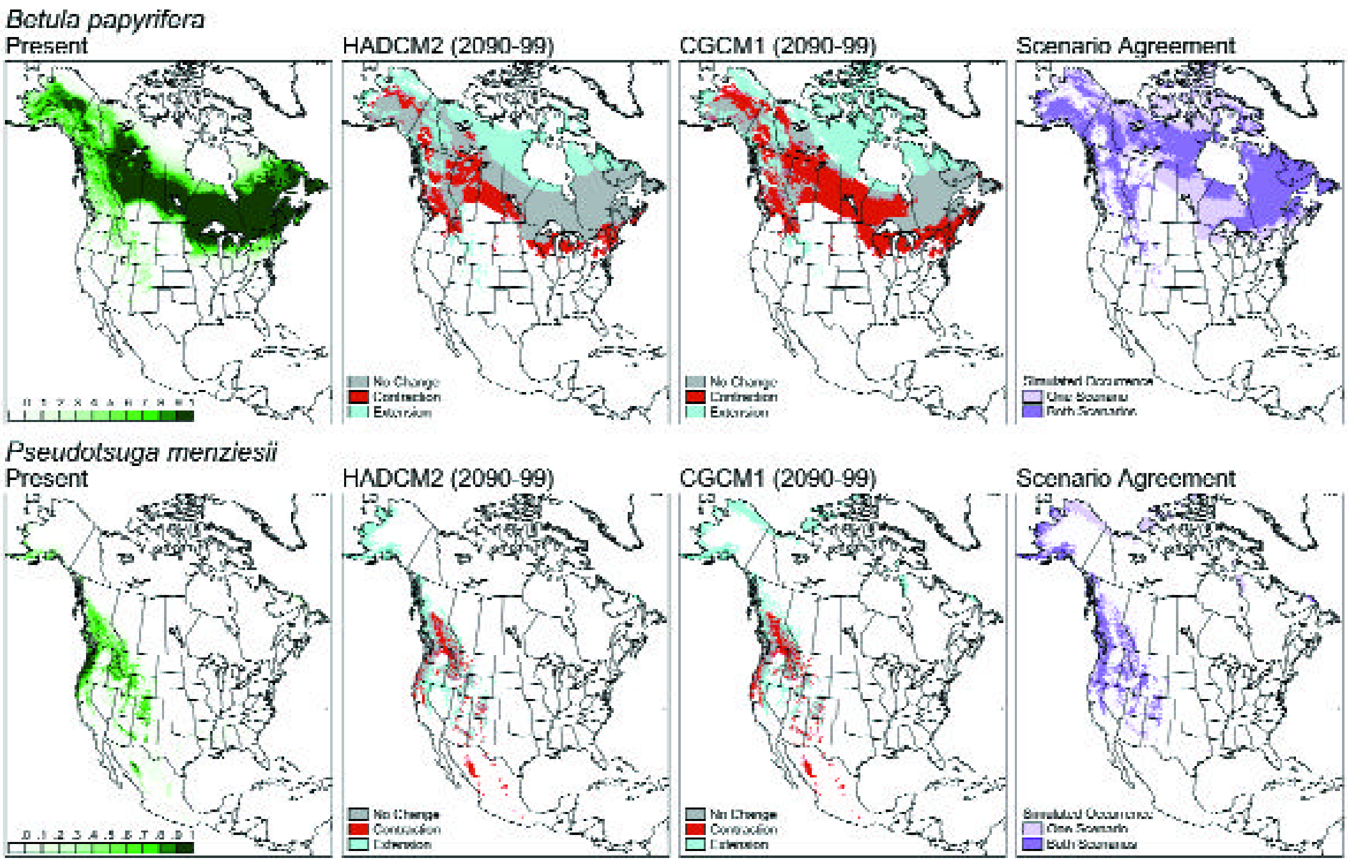

Figure 7. Simulated distributions and scenario agreement for *Betula papyrifera* and *Pseudotsuga menziesii* (after Hansen et al., 2001). Estimated probabilities of occurrence for each taxon simulated with observed modern climate (left panel). Comparison of the observed distributions with the simulated future distributions under future climate conditions as generated by the Hadley (HADCM2) and Canadian (CGCM1) scenarios for 2090-2099 (middle panels). Gray indicates locations where the taxon is observed today and is simulated to occur under future climate conditions; red indicates locations where the taxon is observed today but is simulated to be absent under future climate conditions; and blue indicates locations where the taxon is absent today but is simulated to occur under future climate conditions. Scenario agreement (right panel). Light purple indicates locations where the species is simulated to be present under the future climate of either the HADCM2 or CGCM1 scenario; dark purple indicates locations where the species is simulated to be present under both future climate scenarios.

Forests

Average Price for Standing Timber in US Forests

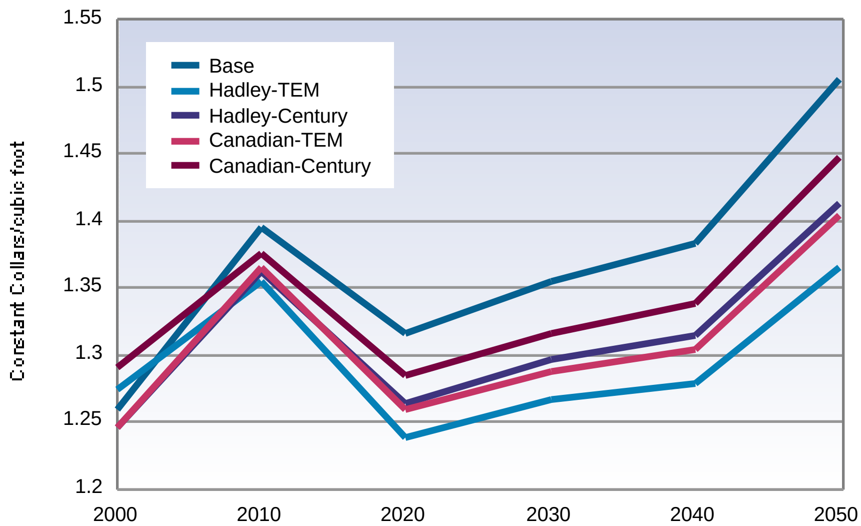

Figure 8. Prices for standing timber under all climate change scenarios remain lower than a future without climate change (baseline). Prices under the Canadian scenario remain higher than prices under the Hadley scenario when either the TEM or the Century model are used. (Irland et al., 2001).

Change in Timber Product Welfare from 2001 to 2100

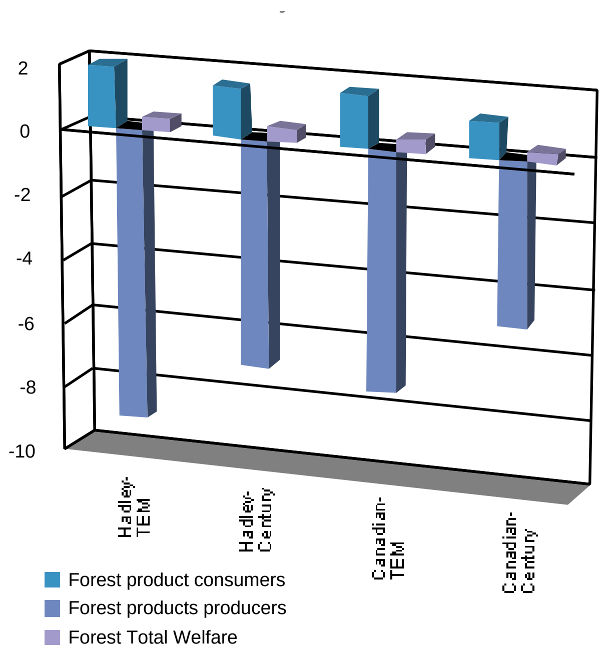

Figure 9. Increased forest growth overall leads to increased wood supply; reductions in log prices decrease producers' welfare (profits), but generally benefit consumers through lower wood-product prices. Welfare is present value of consumer and producer surplus discounted at 4% for 2000-2100. (Irland et al., 2001).