

Changes in Storm Tracks

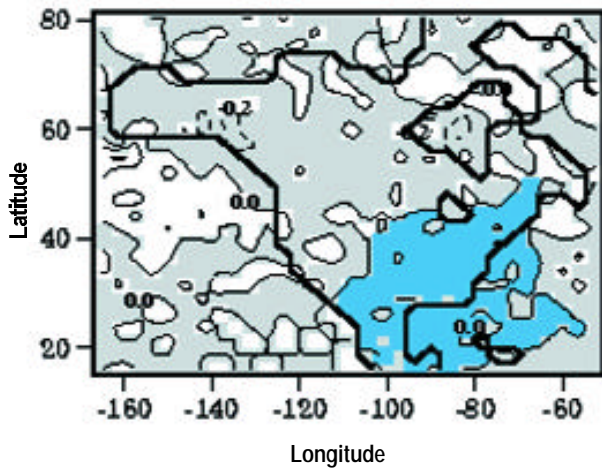


Figure 1. A storm track analysis from the Hadley climate model scenario projects a slightly strengthened wintertime storm track through the Northeast in the 2020s, because the jet stream has a more north-to-south position along the East Coast. This scenario projects a slightly stronger winter storm area (dark shaded region). The Canadian climate scenario has a more east-west jet, and in general indicates slightly weaker storminess.

Palmer Drought Severity Index Change

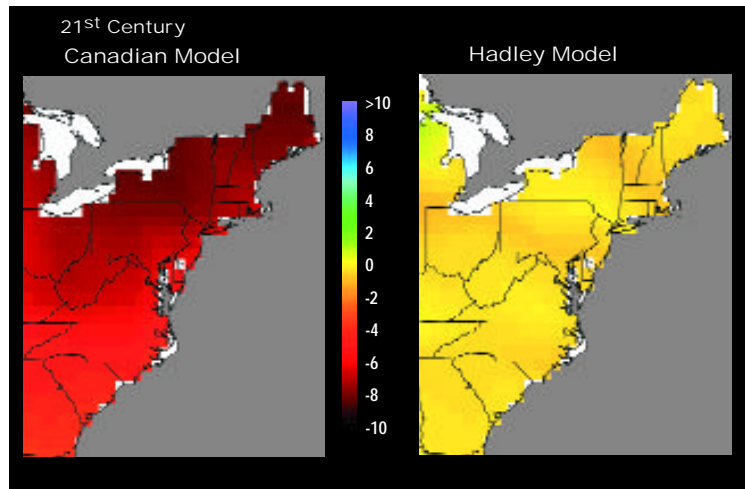


Figure 2. The projected trends in the Palmer Drought Severity Index (PDSI) are dependent on the projections of temperature and precipitation. Large increases in drought tendencies occur in the Northeast in the Canadian model associated with substantial warming and small changes in precipitation. In contrast, the Hadley model yields larger increases in precipitation and a more modest warming, conditions under which the drought tendency tends to decline.

Ecosystem Models

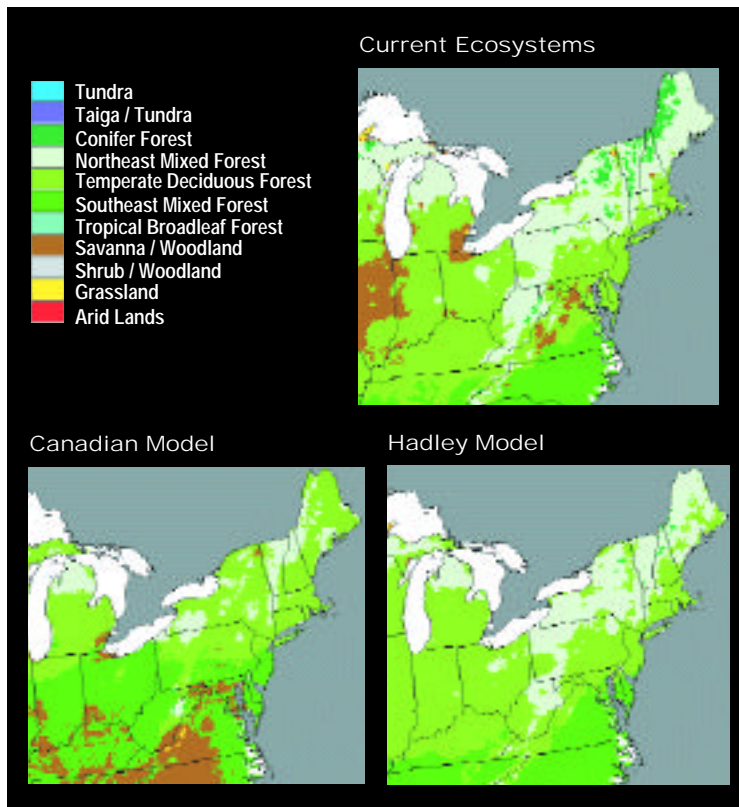


Figure 3. The projected changes in vegetation character using output of the Canadian (a) and the Hadley (b) models indicates a substantial northward shift in the vegetation types. These changes are significantly larger in the Canadian model scenario, which projects a greater warming trend with little change or a decrease in precipitation. Based on the model of Neilson and Drapek (1998).

Percent Salinity Change in the Chesapeake Bay

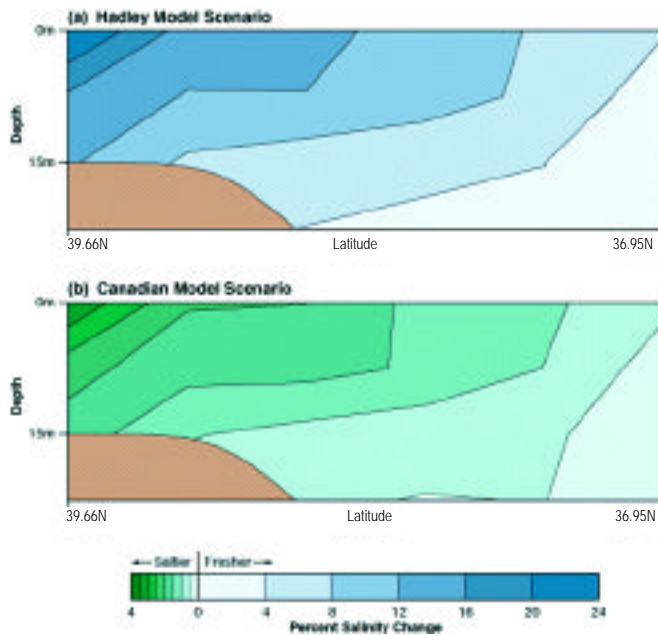


Figure 7. Calculated salinity within the Chesapeake given the runoff calculated from the Hadley (top) and Canadian (bottom) climate scenarios by Gibson and Najjar (2000). The distribution of salinities ranges from the upper reaches of the Bay (39.66N) to the Lower Chesapeake near its Atlantic opening (36.95N).

Potential Changes In Severe Weather

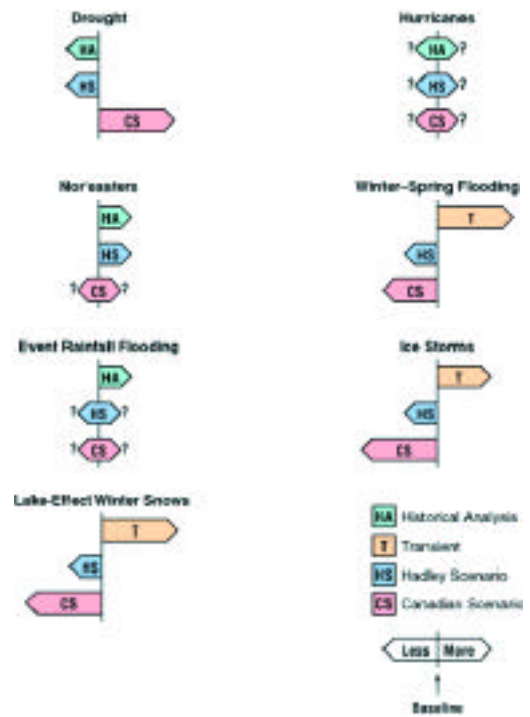


Figure 5. Schematic of the potential changes in severe weather for the Northeast based on historical data (H), the Hadley model scenario (HS), the Canadian model scenario (CS) or an assessment of possible transient effects (T).

Northeast

Nor'easter of December 1992

The December 11-12, 1992 nor'easter produced some of the worst flooding and strongest winds on record for the area. It resulted in a near shutdown of the New York metropolitan transportation system and evacuation of many seaside communities in New Jersey and Long Island.

This storm should have provided a "wake-up" call, heralding the vulnerability of the transportation system to major nor'easters and hurricanes. Had flood levels been only 1 to 2 feet above the actual high water level of 8.5-foot above mean sea level, massive inundation of rail and subway tunnels could have resulted in loss of life. With rising sea levels, even a weaker storm would produce comparable damage. While hurricanes are much less frequent than nor'easters in this area, they can be even more destructive because the geometry of the New Jersey and Long Island coasts amplifies surge levels toward the New York City harbor. For a worst-case scenario category-3 hurricane, surge levels could rise 25 feet above mean sea level at JFK airport and 21 feet at the Lincoln tunnel entrance.



Figure 8. Vulnerable coastal areas for Manhattan, based on a 20-foot high flooding zone for the year 2100, derived by Klaus Jacob of Lamont-Doherty Earth Observatory for the Metroeast workshop.

Dominant Forest Types

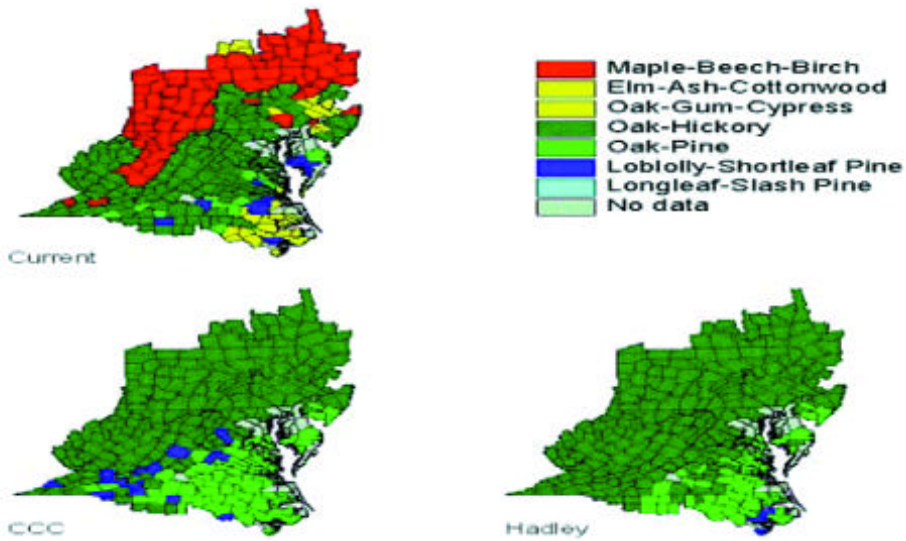


Figure 12. Dominant forest types for the mid-Atlantic region for current climate, and the potential distribution of these forest types for the Canadian and Hadley climate scenarios based on the Mid-Atlantic Assessment. Based on the model of Iverson and Prasad (1998).



Figure 11. On warm humid days when temperatures exceed 90°F, ozone problems are exacerbated across the region. The top figure shows the view on a clear day at the Great Gulf of Mount Washington, New Hampshire. The bottom figure shows the same view when temperatures exceed 90°F and air quality problems occur.

Figure 10. Outdoor recreation is of major economic importance in the Northeast, and it is tightly coupled to climatic conditions.