



Union of Concerned Scientists

Northeast Climate Impacts Assessment

Overview

The Union of Concerned Scientists is collaborating with a team of independent experts to develop and communicate a new assessment of climate change and associated impacts on key climate-sensitive sectors in the Northeast region. The NECIA approach combines state-of-the-art analyses with effective outreach to provide opinion leaders, policymakers, and the public with the best available science upon which to base informed choices about climate change mitigation and adaptation. NECIA released the core climate projections for the Northeast on October 4, 2006 and will release a second report focusing on sectoral impacts in 2007.

1. Core design features

- **Analytic approach:** NECIA is assessing projected changes in climate and potential impacts through 2100 under future scenarios of both lower and higher greenhouse gas emissions.
- **Geographic scope:** The climate analyses covers nine northeastern states, from Maine to Pennsylvania.
- **Sectoral scope:** NECIA is developing a range of analyses to assess climate change impacts on forests and agriculture, coastal and marine resources, human health, and urban centers across the Northeast.
- **Participation:** Collaborators include over forty physical, biological, and social scientists based primarily at universities and other research institutions across the Northeast. Oversight and guidance is provided by a multidisciplinary Synthesis Team of senior scientists. UCS is facilitating this assessment.

2. Observed and Projected Climate for the Northeast

- **Objective:** To develop a robust understanding of observed historical and projected future changes in surface climate and climate-related processes over the Northeastern United States.
- **Approach:** Using historical weather and hydrological observations, historical climate simulations and future climate projections for the SRES B1 (lower) and A1fi (higher) emission scenarios from four atmosphere-ocean general circulation models (AOGCMs), statistical and dynamical downscaling, and dynamical hydrologic modeling, NECIA authors assessed changes in mean and extreme climate, atmospheric dynamics, climate indicators, and hydrology for the Northeast region.

Specifically, NECIA addressed the following:

- **Region-wide past climate:** What are the observed region-wide trends in key indicators of climate change and broad-scale atmospheric circulation patterns? How well do GCM simulations compare with the means, variance and trends in these observations?
- **Spatially-resolved past climate:** How well do statistically and regionally downscaled climate variables compare with observations? What does this tell us regarding the degree of confidence that we can place in future projections?
- **Future climate:** What trends in Northeast climate, as projected from GCM output, downscaled model simulations and indicator models, appear realistic (relative to observations) and show significant differences between emission scenarios?
- **Climate model selection:** The three global climate models were prioritized for use in the impacts analyses are HADCM3, PCM, and GFDL. Criteria for selecting global climate models included the length of model history, model documentation and evaluation in the peer-reviewed literature, availability of the higher A1fi scenario, consistency with previous studies, and model performance in simulating Northeast regional climate across a range of climate variables.
- **Technical products:** Inter-model comparisons of observed and projected climate change across the Northeast were completed. One component of the analysis has been published in the journal, *Climate Dynamics*, while the other is in review with the *Bulletin of the American Meteorological Society*.

3. Sectoral Impacts Assessment

- **Objective:** To develop quantitative analyses of climate change impacts on key sectors and issues across the Northeast under higher and lower pathways of future heat-trapping emissions, and to frame considerations for societal responses—both adaptation and mitigation.
- **Approach:** The NECIA used several filters to identify and develop specific impacts analyses, including robust methods, technical feasibility, strong engagement of the expert community, and high salience for non-technical audiences (e.g. high economic and/or iconic importance to the region).
- **Current Status:** More than thirty research collaborators are engaged in the sectoral impacts phase of the assessment and have worked together to develop and refine analytical approaches to this research. A core set of more than a dozen quantitative analyses are poised for completion and synthesis within the assessment timeframe.

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