



# Protecting North Carolina's Economy, Communities and Environment from Global Warming

Global warming is already affecting North Carolina, and will continue to do so for decades to come. In the absence of national policy that jumpstarts the clean energy economy by ramping down dangerous carbon emissions, our economy and wildlands are at an even greater risk. As a result, additional resources are even more necessary for protecting our natural heritage, jobs, and communities from climate disruption. Given the scale of the threat, there is no time to waste.

### Critical Issues for North Carolina:

- Rising sea level
- Damage to local economy
- Increasing temperatures
- Decreasing water availability

## Is Global Warming Affecting Natural Resources in North Carolina?

Yes. North Carolina is warming. Since mid-century, **temperatures across the state have risen approximately 1.2°F,<sup>1</sup> and are expected to rise up to an additional 5°F by 2060.** A temperature rise of just 4° would cause central North Carolina to resemble the climate of central Florida.<sup>2</sup> These changes are significant, and the impacts are already being felt.

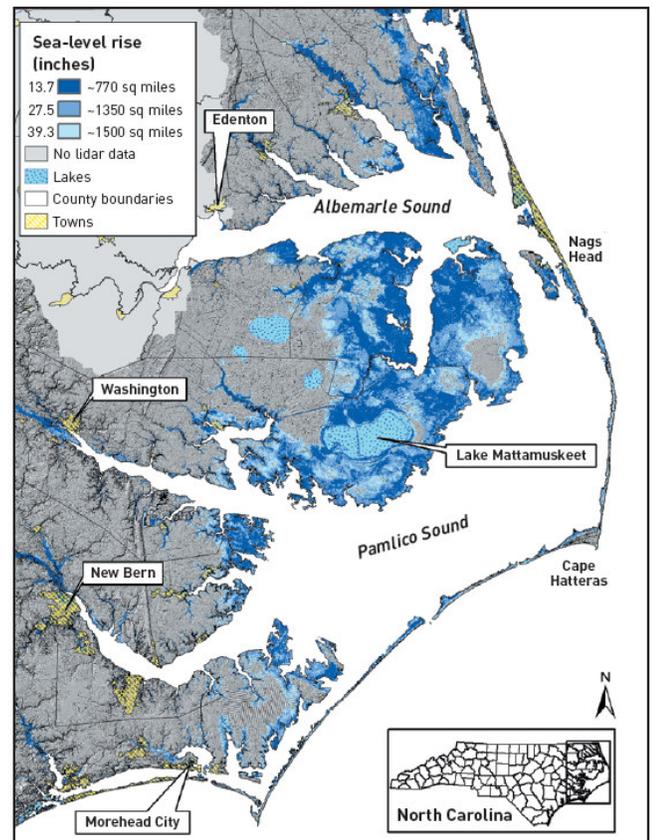
Across the U.S., more than 80% of plant and animal species studied are shifting their ranges in reaction to less than 1° F of warming in the last century.<sup>3</sup> The IPCC predicts further warming could result in **up to 30% of known species becoming extinct**, and the disappearance of more than one-fifth of the world's ecosystems.<sup>4</sup>

From the western forests to the coast, the affects of global warming are being felt across North Carolina. Many areas of North Carolina's coastline are sinking at a rate of nearly 7 inches per century, and studies predict that sea level rise of 18 inches is possible by 2080, **flooding more than 770 miles of the state's coast.**<sup>5</sup> Upland ecosystems are seeing a decline in high elevation spruce firs, loss of brook trout habitat due to rising steam temperatures<sup>6</sup> and the destruction of hemlock forests by invasive species.<sup>7</sup>

### Natural Resources Adaptation Funding Will:

- Create and protect jobs
- Preserve treasured landscapes
- Revive the rural economy
- Provide clean air and water for future generations

Possible North Carolina coastline after continued sea-level rise



Source: Ben Poulter, Duke University, and Sam Pearsall, The Nature Conservancy, 2003

## What's at Stake?

Changes brought on by global warming are disrupting the balance of natural resources and having significant impacts on communities and businesses across the state.

- **Communities:** In four North Carolina counties alone, an 18-inch rise in sea level by 2080 could cause over \$2.8 billion in property value losses. In Bertie County, property losses are projected to be \$9.25 million.<sup>8</sup> This will disproportionately affect low-income families who can least afford to move or take other preventive measures.
- **Clean Water and Agriculture:** With rising temperatures and decreasing precipitation, economic losses from droughts, particularly in the agricultural sector, can be expected to worsen. In 2002 alone, droughts caused over \$600 million in losses to agricultural and other sectors—and affected over 4,000 jobs.<sup>9</sup> With 98% of public supply systems drawing from ground water sources, water shortages from coastal flooding, saltwater intrusion into aquifers, and increased droughts will have severe effects.<sup>10</sup>
- **Health:** The Center for Disease Control considers increased risks associated with air pollution, heat waves, extreme weather events, water and food borne infectious diseases to be major public health issues in the face of climate change.<sup>11</sup> Increased health risks bring with them increased costs. Asthma, expected to worsen as climate change decreases local air quality, cost North Carolina \$631 million in 2003.<sup>12</sup>
- **Local Businesses:** North Carolina's outdoor recreation industry is dependent on healthy ecosystems—businesses that support fishing, rafting, and camping are being threatened by the effects of global warming, putting at risk North Carolina's \$7.5 billion outdoor recreation economy.<sup>13</sup> The Great Smoky Mountains National Park, a World Heritage site and one of the most visited parks in the US, is losing its iconic Fraser firs.<sup>14</sup> As the health of North Carolina's forests suffers, a range of businesses and vital natural services are likely to be negatively affected, such as North Carolina's \$100 million per year Christmas tree industry.<sup>15</sup>



*Protecting North Carolina's forests – and the valuable services they provide – will safeguard communities across the state.*

**Economy at Risk:**  
**\$7.5 Billion**  
*Annual contribution of outdoor recreation to North Carolina's economy*

## Protecting Natural Resources, Creating Jobs

Restoring ecosystem health helps ensure species have the best possible chance to adapt to the effects of global warming. Ecosystem adaptation projects, such as establishing wildlife corridors for animals migrating in search of needed habitat, are critical to the survival of many species and create long-term American jobs. **Investing now in natural resources is the most cost-effective way to protect our treasured landscapes and the clean water, clean air and jobs they provide.**

**Proper climate-smart conservation funding will allow North Carolina's wildlife and land management agencies, as well as the Land and Water Conservation Fund and the Forest Legacy Program, to ramp up important conservation projects.**

## **Climate-smart conservation funding will allow scientists, engineers, construction crews, and others to be employed across North Carolina:**

- Repairing damaged watersheds to ensure clean water for communities through removing impediments and deteriorating structures, restoring eroding river banks, and repairing in-stream habitat.
- Acquiring land and establishing migration corridors to increase species' survival as climates change.
- Monitoring wildlife, their habitat and local climate and developing appropriate adaptation responses.
- Restoring native landscapes to increase resiliency in a warming world by removing unnecessary roads and barriers, constructing buffer strips along river corridors, and removing invasive species.

This work will protect and create American jobs—providing new skills and income to workers and their families across the state and revitalize rural economies.



*Restoring river habitats protects ecosystems, jobs, and drinking water*

## **Investing in Solutions for Families, Businesses and the Planet**

The risks to North Carolina and the nation from global warming are significant—and require an extensive and sustained commitment to reducing heat-trapping pollution, and to protecting our natural resources and the communities that rely on them.

### **Congress must address climate disruption by:**

- **Defending the authority of our public and environmental health agencies to reduce carbon pollution.**
- **Safeguarding our communities and generating new jobs by investing in projects that keep our natural resources resilient in a warming world.**
- **Steering national energy policy away from sources that make the climate crisis worse and towards renewable energy and energy efficiency that generate jobs for the future.**

North Carolina and the nation need your support for reducing carbon pollution, protecting communities by investing in American Jobs on American Lands that safeguard our natural resources, and generating new jobs by steering national energy policy in the direction of non-polluting renewable energy and energy efficiency technologies.

### ***For more information, please contact:***

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Text Box: Outdoor Industry Association. 2007. "State by State Active Outdoor Recreation Economy Report." Available from: [http://www.outdoorindustry.org/research.php?action=detail&research\\_id=52](http://www.outdoorindustry.org/research.php?action=detail&research_id=52)

Map: Munger, Amber and Michael Shore. 2005. "Understanding Global Warming for North Carolina. Sound Science for Making Informed Decisions." Environmental Defense Fund. Available from: [http://www.edf.org/documents/3053\\_NCClimateReport.pdf](http://www.edf.org/documents/3053_NCClimateReport.pdf)

Photo Credits: Thanks to USGS, the State of North Carolina, the State of Massachusetts, and US FWS.

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<sup>1</sup> NOAA National Climatic Data Center. 2009. "U.S. Climate at a Glance – Statewide." Available from:

<http://www.ncdc.noaa.gov/oa/climate/research/cag3/state.html>

<sup>2</sup> Munger, Amber and Michael Shore. 2005. "Understanding Global Warming for North Carolina. Sound Science for Making Informed Decisions." Environmental Defense Fund. Available from: [http://www.edf.org/documents/3053\\_NCClimateReport.pdf](http://www.edf.org/documents/3053_NCClimateReport.pdf)

<sup>3</sup> Sagarin, Raphael. 2002. "Historical Studies of Species' Responses to Climate Change." In: *Wildlife Responses to Climate Change: North American Case Studies*. Ed: Terry L. Root and Stephen H. Schneider. Island Press. Washington, DC.

<sup>4</sup> Intergovernmental Panel on Climate Change. 2007. "Summary for Policy Makers." In: *Climate Change 2007: Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Pg 792.

<sup>5</sup> Bin et al. 2007. "Measuring the Impacts of Climate Change on North Carolina Coastal Resources." National Commission on Energy Policy. Available from: <http://econ.appstate.edu/climate/NC-NCEP%20final%20report.031507.pdf>; Munger and Shore. Pg. 11

<sup>6</sup> Nash, Steve. 2008. "Double Vision. Climate Change Comes to the Mountains." *Blue Ridge Country*. November December 2008.

Available from: <http://www.forestthreats.org/news-events/in-the-news/Blue-Ridge-Country-article.pdf>

<sup>7</sup> Nuckolls, April E. 2008. "Hemlock Declines Rapidly with Hemlock Woolly Adelgid Infestation: Impacts on the Carbon Cycle of Southern Appalachian Forests." In: *Ecosystems*. December 2008. Available from:

<http://www.sciencedaily.com/releases/2009/02/090226122730.htm>

<sup>8</sup> Bin et al. 2007; Center for Integrative Environmental Research. 2008. "North Carolina Economic Impacts of Climate Change Full Report." University of Maryland. Available from:

<http://www.cier.umd.edu/climateadaptation/North%20Carolina%20Economic%20Impacts%20of%20Climate%20Change%20Full%20Report.pdf>

<sup>9</sup> Hayes, M.J., Svoboda, M.D., Knutson C. L., and Wilhite D.A. (2004). 'Estimating the Economic Impacts of Drought.' Joint Session 2, Drought: Variability Monitoring, Impacts, and Prediction (Joint between the 15th Symposium on Global Change and Climate Variations and the 14th Conference on Applied Climatology; Room 6C); Center for Integrative Environmental Research. 2008.

<http://www.cier.umd.edu/climateadaptation/North%20Carolina%20Economic%20Impacts%20of%20Climate%20Change%20Full%20Report.pdf>

<sup>10</sup> Center for Integrative Environmental Research. 2008. Pg. 12.

<sup>11</sup> Frumkin, Howard. 2009. Testimony before the Committee of Energy and Public Works. "Update on the Latest Global Warming Science: Public Health." February 25. Available from: [http://epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore\\_id=aefa9ec4-cb40-449e-a5d0-b5660a508f90](http://epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=aefa9ec4-cb40-449e-a5d0-b5660a508f90)

<sup>12</sup> Jensen, K. (2006). 'Burden of Asthma in North Carolina.' Raleigh, NC: N.C. Department of Health and Human Services.

<sup>13</sup> Outdoor Industry Association. 2007.

<sup>14</sup> National Parks Conservation Association. "Unnatural Disaster: Global Warming and our National Parks." Available from:

[http://www.npca.org/globalwarming/unnatural\\_disaster.pdf](http://www.npca.org/globalwarming/unnatural_disaster.pdf)

<sup>15</sup> North Carolina Department of Agriculture and Consumer Services. "Marketing Division – Christmas Trees." Available from:

<http://www.ncagr.gov/markets/commodit/horticult/xmastree/>