

## Regional Highlight: Southeast

### The US Economic Impacts of Climate Change and the Costs of Inaction

A Review and Assessment by the Center for Integrative Environmental Research (CIER) at the University of Maryland

October 2007

#### Background

As science continues to bring clarity to present and future global climate change, policymakers are beginning to respond and propose policies that aim to curb greenhouse gas emissions. Although these policies are gaining momentum, their importance is not fully understood by many. All too frequently, inaction is motivated by the perceived high cost of reducing greenhouse gas emissions. The costs of not taking on the challenge posed by climate change are frequently neglected and typically not calculated. Throughout the United States, individuals and communities depend on sectors and systems that are expected to be greatly affected by the impacts of continued climate change.

- The **agricultural sector** is likely to experience uneven impacts throughout the country. Initial economic gains from altered growing conditions will likely be lost as temperatures continue to rise. Regional droughts, water shortages, as well as excess precipitation, and spread of pest and diseases will negatively impact agriculture in most regions.
- Storms and sea level rise threaten extensive **coastal infrastructure** – including transportation networks, coastal developments, and water and energy supply systems.
- Current **energy** supply and demand equilibria will be disrupted as electricity consumption climbs when demand grows in peak summer months. At the same time, delivering adequate supply of electricity may become more expensive because of extreme weather events.
- Increased incidence of asthma, heat-related diseases, and other respiratory ailments may result from climate change, affecting **human health** and well-being.
- More frequent and severe **forest fires** are expected, putting ecosystems and human settlements at peril.

- The reliability of **water supply networks** may be compromised, influencing agricultural production, as well as availability of water for household and industrial uses.

#### Southeast

With warmer weather and warmer water in the Atlantic and the Gulf of Mexico, the region may experience an increased frequency and intensity of storms, sea level rise, and the loss of important agricultural areas, crops and timber species. In addition to coastal infrastructure, forests, agriculture and fisheries, water quality and energy may be subject to notable change and damages as well. Although the picture is incomplete because of data limitations, a valuable glimpse of the extent to which climate change will affect these economic sectors can be gleaned from the summary below.

#### Coastal Infrastructure

- Since 1980, the United States has witnessed 70 natural disasters – including hurricanes, floods, heat waves, and droughts – each causing over \$1 billion in damages. Fifty-eight of these events have occurred since 1990 and 29 have been in the Southeast.
- Each state except Kentucky experienced at least 16 natural disasters; Texas, Alabama, Georgia, Florida, and North Carolina each experienced at least 21 from 1980–2006.
- In 2005, the nation was made painfully aware of the damages possible from extreme storm events when Hurricanes Katrina and Rita struck. A total of 90,000 square miles was declared a federal disaster area following Hurricane Katrina, covering four states and 23 coastal counties and parishes. Eighty percent of the City of New Orleans was flooded, and more than 1,700 lives were lost. More than 350,000 homes were destroyed and another 146,000 seriously damaged. A total of 850,791 housing units were damaged. At an estimated \$100,000 repair cost per unit, the total cost to rebuild could exceed \$85 billion. In addition to the urban infrastructure damaged by the storms, it was

estimated that 2,100 oil platforms and over 15,000 miles of pipeline were damaged. Lost revenue due to the damages amounted to almost \$11 billion – 153 million barrels of oil (of an annual total of 547 million) at approximately \$70 per barrel at the time of the hurricanes. The questions of what to rebuild, when, and at what cost have spurred debates locally, regionally and nationally, and have stirred deep-seated environmental justice concerns.

#### Other impacts

- **Forestry** is a major economic sector in the Southeast. For example, the state of South Carolina boasts 60% forest cover and forestry is, after tourism, the second largest economic sector. Given the diversity of species and environmental conditions, short- to medium-term impacts on forests are uncertain. Sea level rise resulting in salt water intrusion may damage forests, particularly in southern Florida and Louisiana. Higher temperatures, decreased soil moisture, and more frequent fires may stress forest ecosystems and ultimately lead to a conversion from forest to savannah and grassland. However, some species may see, at least temporarily, increases in productivity and forested acreage due to a longer growing season, CO<sub>2</sub> fertilization, and a switch from stressed to more acclimatized species.
- As increased storm frequency and intensity impacts coastal infrastructure, they may also reduce **water quality** and harm **fish** populations. Fish and shellfish are at risk in warmer waters and when exposed to increased pollution following major storm events. Much of this pollution will come from stronger storms stressing water management systems and causing sewer systems to overflow, as well as increased nutrient runoff from agricultural lands.
- **Energy** demand will also change in the Southeast as temperatures increase. Increased energy demand to meet cooling needs may stress the energy supply system and waste heat may exacerbate urban heat island effects and their associated human and environmental health impacts.

## Nationwide

An assessment of the possible impacts of inaction is presented in the University of Maryland report, *The US Economic Impacts of Climate Change and the Cost of Inaction*. The range of climate changes anticipated in the United States will have real impacts on the natural environment as well as human-made infrastructure and its ability to contribute to economic activity and quality of life. The assessment suggests a need for immediate national policy to cut emissions, and a federally-funded set of region- and sector-specific studies to guide climate policy and investment.

#### Five key lessons from the complete report:

1. Economic impacts of climate change will occur throughout the country.
2. Economic impacts will be unevenly distributed across regions and within the economy and society.
3. Negative climate impacts will outweigh benefits for most sectors that provide essential goods and services to society.
4. Climate change impacts will place immense strains on public sector budgets.
5. Secondary effects of climate impacts can include higher prices, reduced income and job loss.

#### SOURCES

As documented in the full report, data sources for the Southeast region include:

Burkett, V., R. Ritschard, S. McNulty, J.J. O'Brien, R. Abt, J. Jones, U. Hatch, B. Murray, S. Jagtap and J. Cruise. 2001. *Potential Consequences Of Climate Variability And Change For The Southeastern United States*. Ch. 5, pp 137-164. Report for the US Global Change Research Program. Cambridge University Press, Cambridge, UK. Available online at <http://www.usgcrp.gov/usgcrp/nacc/se-mega-region.htm>.

Lott, N. and T. Ross. 2006. *Tracking and Evaluating U.S. Billion Dollar Weather Disasters, 1980-2005*. National Climatic Data Center (NCDC) Available online at <http://www1.ncdc.noaa.gov/pub/data/papers/200686ams1.2nlfree.pdf>

Pettersen, J.S., L.D. Stanley, E.G. and J. Philipp. 2006. *A Preliminary Assessment of Social and Economic Impacts Associated with Hurricane Katrina*. *American Anthropologist*. Vol 108. No 4. pp. 643-670.

South Carolina State Climatology Office. 2007. *The Impact of Climate Change on South Carolina*. South Carolina Department of Natural Resources. Columbia, SC. Available online at [http://www.dnr.sc.gov/climate/sco/Publications/climate\\_change\\_impacts.php](http://www.dnr.sc.gov/climate/sco/Publications/climate_change_impacts.php)

*For the complete report, The US Economic Impacts of Climate Change and the Cost of Inaction, see: <http://www.cier.umd.edu/climateadaptation>. We thank Environmental Defense for support of this research.*

