Global Warming Impacts on Coral, Invasive Species in the Southern United States

U.S.D.A. Assessment

The final U.S. Department of Agriculture report released in May 2008 predicts that climate change will continue to inflict serious damage on the region's coral reefs, and will spur the northward advance of invasive weeds such as kudzu while lessening the effectiveness of popular herbicides. The full report is available online at: http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm

The report estimates that in the next 30 years, CO2 concentrations are expected to have increased about 60 ppm, from today's 380 ppm to about 440 ppm, and temperatures over the contiguous United States are expected to have increased by an average of 2.2 degrees Fahrenheit.[1]

Impacts on two key Southern resource issues include:

Invasive Weeds: The report predicts that kudzu, a rapacious weed that is already listed as invasive in 22 states (AR, CT, DC, DE, FL, GA, IL, IN, KY, MD, MO, MS, NC, ND, NJ, OR, PA, SC, TN, TX, VA and WV),[2] will expand its range northward as temperatures continue to rise. *"The habitable zone of many weed species is largely determined by temperature, and weed scientists have long recognized the potential for northward expansion of weed species' ranges as the climate changes… more than 15 years ago, (researchers) utilized climate model projections… to forecast the northward expansion of kudzu, an aggressive invasive weed that currently infests more than (2.5 million acres) in the southeastern U.S."*[3] In addition, the report says that the herbicide glyphosate (whose trade names include Roundup, Rodeo and Pondmaster), the nation's most widely used weed killer, loses its effectiveness on weeds grown at CO2 concentrations that *"likely will occur in the coming decades."*[4]

Coral Reefs: Increasing water temperatures, lowered water acidity and a rise in the number and intensity of storms already have inflicted serious damage on U.S. coral reefs, particularly in the Florida Keys and U.S. Virgin Islands. U.S. coral reefs provide an estimated $30 billion in annual ecosystem services value, from tourism and other

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[1] U.S. Dept. of Agriculture, "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;" final report, May 2008; p. 31, http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm

[2] U.S. Dept. of Agriculture, National Agriculture Library, http://www.nps.gov/plants/ALIEN/map/pumol.htm

[3] U.S. Dept. of Agriculture, "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;" final report, May 2008; p. 60, http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm

[4] U.S. Dept. of Agriculture, "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;" final report, May 2008; p. 59, http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm

non-market services such as fish breeding habitat and coastline protection.[5] "The effects of climate change in marine systems are highlighted by the 2006 proposed listing as Threatened under the Endangered Species Act of two species of corals in the Caribbean. The major threats that motivated the proposed listings… were disease, elevated sea surface temperatures, and hurricanes– all of which relate to climate change and its effects."[6] The report estimates that future damage to the reefs could be catastrophic. *"More recent reviews of experimental studies, modeling projections, and field observations suggest that the combination of changes in ocean surface temperatures, increasing ocean acidity, and a host of other stresses could bring coral reef ecosystems to critical ecological tipping points within decades rather than centuries, and that some regions of the ocean are already near that point from a biogeochemical perspective."*[7]

[5] U.S. Dept. of Agriculture, "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;" final report, May 2008; p. 159, http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm

[6] U.S. Dept. of Agriculture, "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;" final report, May 2008; p. 160, http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm

[7] U.S. Dept. of Agriculture, "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity;" final report, May 2008; p. 162, http://www.climatescience.gov/Library/sap/sap4-3/final-report/default.htm