Forests Devastated By Hurricane Katrina Become Major Carbon Source, Study Finds

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DURHAM, N.H. — In a paper to be published November 16 in the journal Science, a research team of scientists from Tulane University and the University of New Hampshire has estimated that Hurricane Katrina killed or severely damaged approximately 320 million large trees in Gulf Coast forests. Over time, the decaying trees will release approximately 105 million metric tons of carbon dioxide to the atmosphere – roughly equaling the net annual sink in U.S. forest trees.

Katrina’s huge footprint affected five million acres of forest across Mississippi, Louisiana and Alabama, causing damage from downed trees, snapped trunks, and broken limbs to stripped leaves.

“The loss of so many trees will cause these forests to be a net source of carbon dioxide to the atmosphere for years to come,” said the study’s lead author, Jeffrey Chambers, a biologist at Tulane University in New Orleans, La.

Complicating matters, in a world already seeing fast-increasing carbon dioxide levels and resulting global warming, many scientists believe a warming climate will cause a rise in the intensity of extreme events like Hurricane Katrina.

According to study co-author George Hurtt of the UNH Institute for the Study of Earth, Oceans, and Space (EOS) and department of natural resources, if this increase in storm intensity occurs, it could result in a self-perpetuating “positive feedback mechanism” of increasingly intense storms, more decaying trees, and an ongoing release of carbon dioxide from forests.

Says Hurtt, “This could potentially escalate the problem of global warming.” Hurtt, an ecologist who specializes in mathematical modeling, says the work represented by the Science paper was a step towards better understanding the role severe windstorms play in the carbon balance of the planet. The next step is to put the data into sophisticated computer models to better gauge the magnitude of the potential positive feedback mechanism.

“We now need to figure out how strong of a feedback this might be, how much more severe these storms might become for every unit of global warming, and how the forests will be affected by the storms.” Hurtt says. “Until that work is done, it’s not clear if current projections are overly alarmist or too conservative,” adds Hurtt.

To map the forests harmed by Hurricane Katrina and estimate the carbon footprint, the research team from Tulane and UNH studied satellite data captured before and after the storm by Landsat 5 and the Moderate Resolution Imaging Spectroradiometer (MODIS) instrument.
aboard NASA’s Terra satellite. The scientists also used field data gathered on forest trees damaged by the hurricane.

Photos:

http://unh.edu/news/img/IMAGE_1_LandsatPre-Katrina.png

http://unh.edu/news/img/IMAGE_1_LandsatPost-Katrina.png

Caption: Landsat 5 satellite imagery validated the degree of devastation to Gulf Coasts forests, as seen here in pre- and post-Katrina images of the Interstate 10 "twin-span" bridges that cross Lake Ponchartrain east of New Orleans. Bayou Sauvage National Wildlife Refuge is the large patch of forest (green) in the lower left portion of the top image, which suffered heavy tree mortality (seen in red in the bottom image after the storm). Credit: USGS