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Killer heatwave may have fuelled global warming

- Heat and drought of 2003 stifled forest growth
- Carbon dioxide released as plants suffered



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Tim Radford, science editor
Thursday September 22, 2005
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Europe's great heatwave of 2003, which claimed an estimated 35,000 lives and cost the continent's economies an estimated £7bn altogether, may also have fuelled further global warming. A team of more than 30 scientists reports in Nature today that the scorching temperatures and prolonged drought have stifled Europe's forest growth and released huge quantities of carbon dioxide into the atmosphere, to feed still warmer summers in future.

Philippe Ciais from the Laboratory for Climate Sciences and the Environment at Gif-sur-Yvette, France and colleagues from Germany, Italy, Switzerland, Belgium, Spain, Finland and Portugal, took a snapshot of plant life across Europe using satellite data to measure the sunlight being absorbed by beech woodland and pine and oak forests, as well as grassland and stands of spruce.

They measured crop yields and the rate of plant growth to construct a picture of how much carbon was absorbed from the atmosphere, and how much returned.

In temperate climates, forests act as a carbon

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"sink", with some of the greenhouse gases released from fossil fuels becoming locked away again as wood, leaf litter and buried vegetation. But the picture in the summer of 2003 was dramatically different. Plant growth in Europe dropped that summer by 30% overall, and much of the carbon dioxide removed from the atmosphere in the previous four years was released again.

"Such a reduction in Europe's primary productivity is unprecedented during the last century," the scientists report. "An increase in future drought events could turn temperate ecosystems into carbon sources, contributing to positive carbon dioxide feedbacks already anticipated in the tropics and high latitudes."

This is the third warning in three weeks that global warming could be moving to a point of no return. A week ago, US scientists calculated that hurricanes categorised as the most violent had almost doubled in frequency over the past 35 years as sea surface temperatures rose. Two weeks ago a Cranfield University team, who sampled topsoil at 6,000 places in England and Wales over 25 years, reported in *Nature* that England's soils were sending back carbon to the atmosphere at the rate of 4m tonnes a year. The latest news dashes the hope, nursed by climate scientists, that the mix of longer growing seasons and greater levels of carbon dioxide would "fertilise" more vigorous plant growth and offset some of the discharges from factory chimneys and car exhausts.

Climate scientists have already warned that heatwaves of the kind that parched vineyards, ruined orchards, damaged harvests, set forests blazing and claimed so many lives in 2003 that mortuaries overflowed could become more frequent. No one can guess quite how the trees will react as the temperature rises.

"It is reasonable to expect that forests will acclimate if mean temperatures continue to rise gradually across Europe," Dennis Baldocchi, of the University of California, Berkeley, writes, also in *Nature*. "A repeat of extreme temperatures in the near term, on the other hand, could have detrimental, even lethal consequences."

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