

Keynote presentation – Abstract No. 54890

Session - Late Quaternary Ecosystem Dynamics and Carbon Cycling in the Tropics

Title of presentation - Indonesia Burning: The Contemporary Role of Fire in the Carbon Dynamics of Tropical Peatlands

Presenter – Dr Susan Page, Department of Geography, University of Leicester, UK

## **NO HEAT WITHOUT FIRE**

### ***How peatland fires contribute to global warming***

An international group of scientists led by University of Leicester (U.K.) researcher Dr Susan Page has highlighted how peatland fires contribute significantly to global warming through the release of greenhouse gases.

Their research presents new insights into the effects of tropical forest and peatland fires on global climate

Dr Susan Page, of the Department of Geography, University of Leicester, UK and a team of European and Indonesian scientists, used a combination of satellite-based earth observation and intensive field data collection to estimate the amount of the greenhouse gas CO<sub>2</sub> released by fires in the forested and deforested peatlands of Indonesia.

The retrospective study evaluated the impact of the 1997/1998 El Niño driven fire disaster. During that time, fires destroyed huge areas of rainforest and peat soils in South-east Asia, especially in Indonesia.

Dr Page said: “It was the biggest fire catastrophe ever observed in that region. A noxious, yellow cloud of haze extending 3000 x 5000 kilometres covered the region for several months, affecting Indonesia, and neighbouring countries of Singapore, Malaysia, Brunei and Thailand. The economic damage resulting from the smoke alone was estimated to exceed two billion dollars, closing airports, closing down schools and offices and disrupting trade. The polluting ‘haze’ also had a serious impact on human health by increasing respiratory problems, especially amongst the young and elderly.”

For their studies, the scientists focused on tropical peat swamp forest, a largely unknown ecosystem that occurs on deep organic deposits that can exceed 12 metres. Some of these peatlands, particularly in parts of Indonesian Borneo, began to form more than 20,000 yrs ago, and have developed a thick peat layer covering extensive tracts of land. In South-east Asia, tropical peatlands cover 20 Mha (million hectares) and contain an estimated 100 Gt (giga tonnes) of carbon.

Owing to the high carbon content of these organic soils, surface fires spread underground into the peat layer. These fires are characterised by incomplete burning and produce huge amounts of smoke and fine-particled 'haze'. Peat swamp forests represent approximately 40 per cent of the land area in Indonesia that burned during the 1997/1998 fires. The amount of carbon released into the atmosphere during that time is estimated to be in the range 0.81-2.57 Billion tonnes, corresponding to 13 to 40 percent of the annual global production by burning fossil fuels, such as oil, coal and gas.

Dr Page said: "Our work highlights the fact that tropical peatlands store huge amounts of carbon that will continue to be released to the atmosphere as CO<sub>2</sub> during future forest fires and land conversion from forest to agriculture. Carbon dioxide is known to be responsible for the global warming of the atmosphere of the earth. Recurrent fires have, therefore, the threatening potential of making a very significant contribution to this warming, particularly during El Niño weather events, which lead to extended drought conditions throughout South-east Asia and the Pacific region."

Dr Page added: "The data presented during the INQUA conference are as relevant as ever because the forests in Indonesia were again burning during last year's extended dry season, caused by a weak El Niño weather event. Most fires are started for land clearance purposes, but during El Niño years they rapidly spread out of control, consuming both vegetation and underlying peat. The combination of drought with poor land management practices, in particular excessive logging and drainage of the peat swamps, have made this ecosystem very susceptible to fire."

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Staying at Hilton Hotel, Reno for the duration of the INQUA conference.