



# THE WOODS HOLE RESEARCH CENTER

149 Woods Hole Road · Falmouth, MA 02540-1644 USA  
Telephone 508.540.9900 · Fax: 508.540-9700 · [www.wbrc.org](http://www.wbrc.org)

## **Satellites Show Amazon Parks, Indigenous Reserves Stop Forest Clearing**

**January 25, 2006**

Conservation scientists generally agree that many types of protected areas will be needed to protect tropical forests. However, little is known about the comparative performance of inhabited and uninhabited reserves in slowing the most extreme form of forest disturbance: conversion to agriculture. In a paper recently published in *Conservation Biology* (2006, Vol 20, pages 65-73), an international team of scientists, led by Daniel Nepstad of the Woods Hole Research Center and the Instituto de Pesquisa Ambiental da Amazônia, used satellite data to demonstrate, for the first time, that rainforest parks and indigenous territories halt deforestation and forest fires.

According to Nepstad, "Protecting indigenous and traditional peoples' lands and natural areas in the Amazon works to stop deforestation. The idea that many parks in the tropics only exist 'on paper' must be re-examined as must the notion that indigenous reserves are less effective than parks in protecting nature. "

While previous studies had queried park managers about reserve performance, this study is the first to evaluate the effectiveness of tropical protected areas against forest clearing using quantitative analysis of satellite data. The group used satellite-based maps of land cover and fire occurrence between 1997 and 2000 to compare parks and indigenous lands. Deforestation was 1.7 to 20 times higher along the outside versus the inside the perimeter of reserves, while fires were 4 to 9 times higher. Indigenous lands clearly stopped clearing in high-deforestation frontier regions: 33 of 38 indigenous territories with annual deforestation greater than 1.5 percent outside their borders had inner deforestation rates of 0.75 percent or less. Few parks are located in active frontier areas (4 of 15 in the sample) than indigenous lands (33 of 38). But parks' and indigenous lands' ability to inhibit deforestation appear similar.

Indigenous lands occupy one-fifth of the Brazilian Amazon – five times the area under protection in parks – and are currently the most important barrier to Amazon deforestation. Some conservationists argue that with acculturation to market society, indigenous peoples will cease to protect forests. But the authors found that virtually all indigenous lands substantially inhibit deforestation up to 400 years after contact with the national society. There was no correlation between population density in indigenous areas and inhibition of deforestation. In much of the Amazon, not only can protecting nature be reconciled with human habitation – it wouldn't happen without the people.

Extensive intact forests on indigenous territories are central to large-scale conservation in the Amazon. Last year, the Brazilian government created a 5 million hectare mosaic of different kinds of reserves in the Terra do Meio region of Pará state. This connects two existing blocks of indigenous lands into a continuous corridor of protected tropical forest areas of 24 million hectares, the largest in the Amazon and the world. With broad alliances of support from indigenous groups, smallholder farmers, environmentalists, and government, it is possible to create protected areas in the active frontier of the Amazon and elsewhere. This is good news for governments and environmental groups, who have assumed for years that the most important tool for tropical forest conservation is the creation of protected areas.

A tropical forest ecologist, Nepstad has studied Amazon forests and strategies for their conservation for the last 21 years. His research includes forest fires and "savannization", the analysis of public policies to conserve the Amazon's natural resources, the prediction of future trends of Amazon forests and people, and the environmental certification of the region's cattle ranchers and soy farmers. Based in Belém, Brazil, he leads the Center's Amazon program. In 1995, he co-founded the Amazon Institute of Environmental Studies (Instituto de Pesquisa Ambiental da Amazônia), now the largest independent research institution in the Amazon region. He has published more than 75 scientific articles and books on the Amazon. In 1994, he was awarded a Pew Scholars Fellowship in Conservation.