

# Wildfires in South America

**María I Manta** and **Patricio Sanhueza** report on the current situation and trends of wildfires in South America, and the Amazon Basin as a whole

## THIS ARTICLE PROVIDES AN

overview of the wildfire situation in the ten most affected countries of South America: Argentina, Bolivia, Brazil, Colombia, Chile, Ecuador, Paraguay, Peru, Uruguay and Venezuela. Forest covers 50.7 per cent of the region's surface (a total of 8.85 million km<sup>2</sup>) and tropical rain forest covers around 95 per cent of the Amazon Basin. Temperate forests are located primarily in Argentina, Chile, Paraguay and southern Brazil, covering only five per cent of the continent's forested area.

Although South America could be a big forest market thanks to its high proportion of natural forest soils, only four countries have a major stake in forestry and timber production: Brazil, Chile, Argentina, and Uruguay have 78 per cent of planted forests in the region. The main species are eucalypts and pines (*Eucalyptus* and *Pinus* species) which, in general, have a high wildfire risk. There are only a few broadleaved tree plantations in South America.

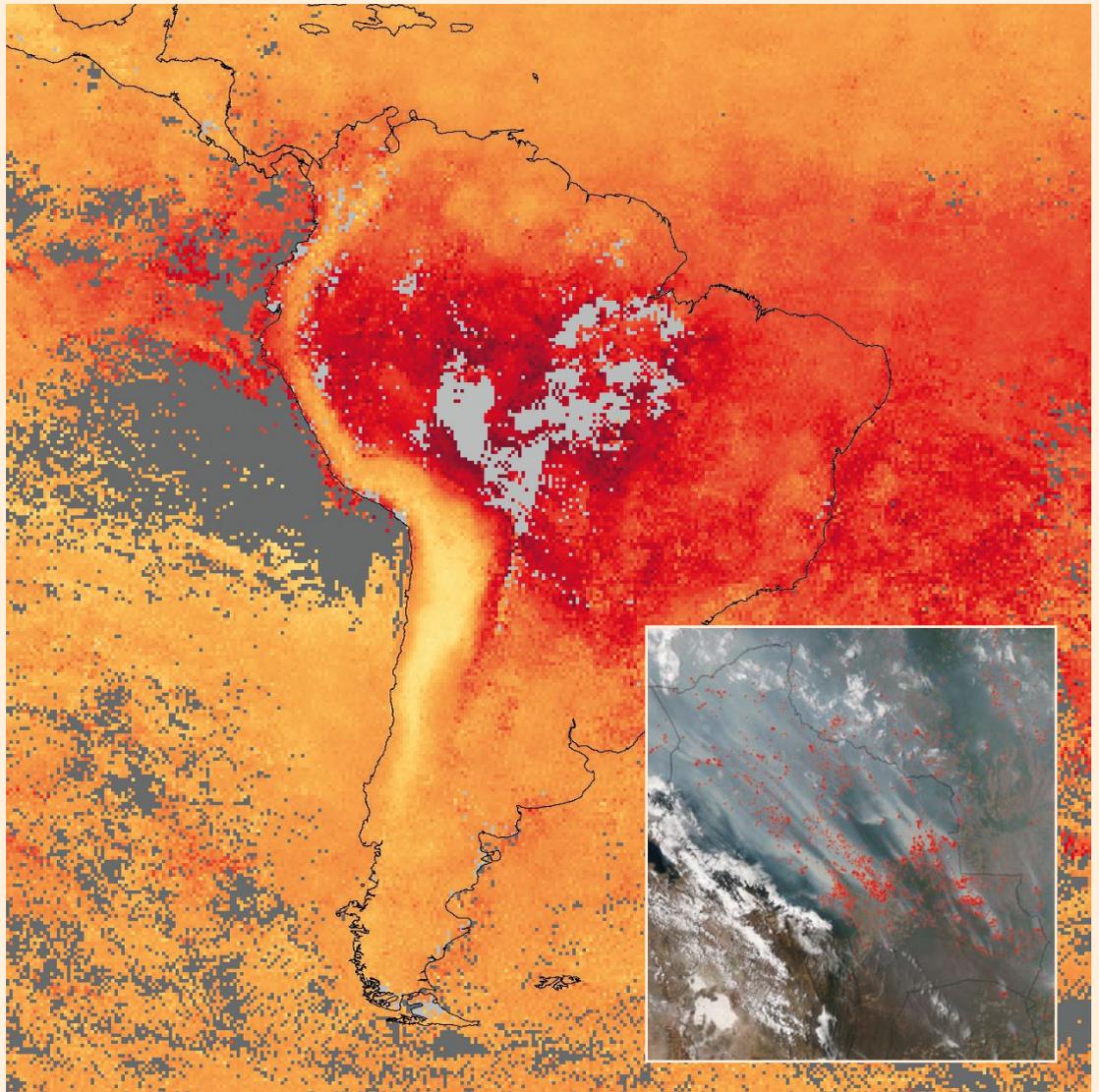
## PROTECTED AREAS

The creation of protected areas has been essential for environmental protection at regional and global level. South America hosts 24 per cent of the world's protected areas. In 2007, Latin America and the Caribbean hosted about four per cent (12 million hectares) of all certified forests in the world.

However, wildfires are present in the ecosystems of all South American countries that are from 12°N to 56°S. Although accurate regional wildfire statistics are not available, it was estimated that during the 1990s about 25,000 wildfires burned 4.3 million hectares of vegetated lands on average each year. Most of the area burned is on forest land (17 per cent), other wooded lands (26 per cent) and other vegetation types (20 per cent), mainly in Brazil, followed by Bolivia and Argentina. The whole annual area burned is thus equivalent to the size of the surface of Venezuela.

Most wildfires are caused by people (approximately more than 85 per cent). There are some aggravating natural factors affecting wildfire risk, intensity and severity, eg lightning or extreme droughts, some of which are related to the effects of El Niño.

The expansion of agriculture, bio energy



*Throughout September 2007, intense fires burned across South America and resulted in widespread smoke pollution. High concentrations of carbon monoxide (dark red) were depicted over the Amazon Basin by the MOPITT sensor on NASA's Terra satellite. Active fires and smoke plumes in Bolivia were depicted by the MODIS sensor on NASA's Aqua satellite*

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production, logging, road construction and livestock ranching, as well as population growth and increased rural and urban development, contribute to an increase of land use fires and wildfires that become out of control. Land clearing involving the targeted use of fire has led to an accumulated deforestation and fire equivalent of approximately 80,000 to 92,000km<sup>2</sup> per year during the past decade.

Policies favouring the construction of oil and gas pipelines and highways in Brazil (from 1975 to 2005 the road net growth was 10 times higher than previously), Colombia, Ecuador, Peru and Venezuela, have indirectly

contributed to deforestation and fires.

Agrarian policies also involve large scale burning for conversion of natural vegetation to agricultural plantations or pastures. The promotion of the expansion of agriculture and livestock sectors lack adequate planning and control mechanisms.

During the 1970s to 1980s, the Atlantic Forest in the south of Brazil and the east of Paraguay almost disappeared because of the expansion of soybean cultivation. Millions of hectares of the 'Chaco' of Argentina and the 'Cerrado' of Brazil have been converted to soybean plantations. The size of cultivation

has duplicated in Argentina, Bolivia, Brazil and Paraguay during the last decade.

It is estimated that in 2020, soybean plantation in the Amazon Basin will reach 22 million hectares. What will be the consequences of this increasing replacement of natural vegetation by agro-ecosystems? Will these be sustainable or result in exhausted soils and desertification?

Political action in most countries of South America is reactive rather than proactive and only when wildfires events reach colossal magnitudes – as in Brazil in 1998 (Roraima, four million ha), Bolivia 1999 (Beni, 12 million ha), Paraguay 1997 (100,000 ha), and Argentina 2003 (3.1 million ha) – are the national authorities prompted to respond and to combat the fires. In Chile, Argentina and Uruguay, however, authorities are prepared to respond to wildfires every year because of the frequent occurrence of wildfires in forest plantations.

## RESPONSIBILITIES

Most South American governments do not provide adequate financial resources to develop and implement national fire management plans, with the exception of Chile, Argentina and Brazil. Also, there is in general no clarity on assigning clear responsibilities to institutions involved in fire management, from local to national level. The professionally skilled human resources responsible for wildfire prevention and suppression are minimal. Furthermore, this problem does not allow for the formulation of local fire management plans and programmes. Most provinces in the countries of South America do not have fire suppression capabilities, and usually the rains or the lack of combustible materials put an end to the wildfires. Argentina, Brazil and Chile – and, in some instances, Venezuela – have terrestrial and aerial resources for firefighting. Elsewhere, six of the ten South American countries do not have any aerial suppression capability and are restricted to ground suppression techniques. Bolivia, Ecuador, Paraguay and Peru do not have any professionally trained and equipped ground crews.

There is a trend in South America towards developing co-operative agreements for mutual assistance in fire management. Chile has signed the highest number of bilateral agreements on collaborative fire management and also has a standard annual operating plan, which details procedures for provision and receiving emergency assistance within the country and at an international level. Other countries like Bolivia, Ecuador, Paraguay, Peru, Uruguay and Venezuela are lagging behind in developing such agreements.

In July 2005, the South American Fire Management Working Group was established within the framework of the 'Regional Co-operation Strategy for the Prevention, Control and Combat of Forest Fires in Latin America

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and the Caribbean' financed by the United Nations' Food and Agriculture Organisation (FAO) and supported technically by the Global Fire Monitoring Centre. This group is supporting governments and civil society in developing fire

management capacities throughout the region.

Deforestation, excessive burning for land use change and wildfires have caused serious environmental damage in the region. A high concern is deforestation, which by 2009 has already modified the structure of 17 per cent of the tropical rain forest in the Amazon basin. If deforestation reaches 30 per cent of the basin, the trend of reduced precipitation will continue, involving more fires and regional smoke pollution which, in turn, will reduce the formation of rain. Forest destruction by 30 per cent may become a point of no return – and the formerly rain-forest covered Amazonian basin will change to a savannah at end of the century, with irreversible effects on the regional and global environment, atmosphere and climate.

Thus, governments of South American countries and the international community are challenged to act swiftly and responsively to reduce planned deforestation, excessive use of fire and wildfires in the region.

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*Wildfires burning at the wildland-urban interface – increasingly observed throughout South America – are a threat to human health and security*

## AUTHORS

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