

# Parallel Session 1

## PS 1/P52

### FRAGMENTATION OF THE BRAZILIAN AMAZON

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Numerous studies have highlighted the significant effects of forest fragmentation in tropical regions. Though deforestation, and now logging, have been documented in the Brazilian Amazon, few large-scale studies have been conducted to understand the extent of forest area potentially impacted by edges caused by deforestation, and no study has done this at a fine scale that includes selectively logged forest. In this study we conduct a literature review (77 articles and 147 impacts) to identify the range of edge effects in intact forest, and then use remote sensing and GIS to quantify the annual impacts from 2000 – 2002 of deforestation and logging edges over more than 1.1 million square kilometers of the Brazilian Amazon. Preliminary findings show not only significant and rapid fragmentation of the Amazon from deforestation, but also high impacts from logging.

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### THE FUTURE OF AGRO-INDUSTRY: MODELING SOYBEAN YIELD IN THE AMAZON BASIN

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Industrial agriculture has become one of the main economic forces driving the expansion of the agricultural frontier in the Brazilian Amazon, led by soybean production. Between 1990 and 2003, soybean production grew from 3 to 14 million tons/year and the area planted increased from 16,000 to 47,000 km<sup>2</sup>. This expansion has been stimulated by several factors, including growing international demand, money devaluation, and improvements in infrastructure. The future expansion of soybean production into the Amazon is still unknown. Here, we present a model of soybean yield that integrates the major climatic, ecological, economic, and spatial determinants in the Amazon Basin. Yield is modeled as a function of: Soybean Physiological Model that captures the effects of climate and physical attributes on the development of soybean plant; fertilizer applications; transport costs; and latitude. The results indicate that these parameters can account for about 45 percent of the spatial variation in yield. We estimated that 20% of Amazon Region has potential to develop soybean crops. The hybrid model provides a mathematical and cartographic framework that the scientific community and policymakers can use in their efforts to maximize the benefits from soybean economic activity while minimizing its negative externalities for Amazon economies and ecosystems.

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### CAN THE AMAZON SURVIVE THE HUMAN SPECIES IN THE 21<sup>ST</sup> CENTURY?

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In this paper we propose to provide an overview of the state of knowledge to date on the impacts of people on the Amazon landscape in recent decades and what this implies for the future. This will