BIOMASS BURNING IN TROPICAL DEFORESTATION SITES: YEAR-TO-YEAR PRACTICES.

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Concern about biomass burning associated to recent deforestation or to common agriculture practices became a critical issue in biogeochemistry. Estimates about the numbers and frequencies of fires have been obtained in areas of tropical deforestation in Brazil from orbital remote sensing (NOAA-AVHRR-band 3 thermal technique). However, very little is known about the actual practices of fire use, e.g., the number of years a same area is burned until all wood is consumed by fire, or how often an area of forest converted to pasture is burned.

This paper describes preliminary results of a temporal analysis of fire and deforestation regimes based on information from high resolution Landsat images digitized in a Geographical Information System (GIS) for about 15,000km2 in the region of Alta Floresta, MT, Brazil (56oW & 10oS), located in the tropical Amazon forest.

The images analyzed were those of 1978 (Landsat-MSS), and of 1984, 1987, 1988 and 1989 (Landsat-TM), in the scale of 1:250,000, and covered the period when development in the region began and also when intense deforestation with biomass burning took place. The approximate deforested areas in km2 with and without fire scars, as well as the total cumulative deforested area found for these years is in the table bellow.

Date of image	31JUL78	08AUG84	16JUL87	20SEP88	22AUG89
km2 not burned	70	1110	1738	770	1280
km2 burned	210	38	97	1500	1250
km2 deforested	280	1148	1836	2270	2530

Preliminary conclusions show that 1) biomass burning is not frequent before August, in agreement with the occurrence of rains in the region; 2) more than 50% of the deforested area is burned every year; 3) deforestation rates were not constant, and had a peak in 1987-88.

On-going work should also include results of the TM images of 1985 and 1986, and the GIS will provide estimates of re-occurrence of fires in the same areas. Fire detection and vegetation index products from NOAA-AVHRR in the same area will also be matched in the GIS to provide calibration for the use AVHRR in real time biomass monitoring and emission inventories. The information from this work should add a significant contribution to the already operational Brazilian systems of AVHRR detection of fires, and of fire density in grid units.