Calibration / Validation Subgroup on Land Product Validation

GOFC-Fire
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Estimate of Burned Areas in the Brazilian Cerrado: Initial AVHRR Algorithm and TM Validation

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This presentation summarizes recent developments and tests of a first-version algorithm to estimate burned areas in the Brazilian contiguous Cerrado (savanas), comprising ~2.2 million km^2. Composite mosaics with 1.5 km spatial definition for periods of 15 days were produced from AVHRR images of the NOAA-14 weather satellite, from May/98 to April/99. The temoral response of different targets such as vegetation affected by fires, agricultural land, exposed soils and water bodies was studied in the AVHRR's mosaics of bands 1 (0.6um), 2 (0.9um), 3 (3.7 um), and NDVI (Normalized Difference Vegetation Index of bands 1 and 2). Thresholds and criteria for band 3 and NDVI variations were obtained to discriminate burned areas; because of reflective soils a Cerrado subdivision was introduced with different thresholds. According to the algorithm about 429,000 km^2 burned in the 12 months studied. The results were validated using 30 m resolution Landsat-TM data in three sites for which two images with 16 days of difference could be found; AVHRR mosaics for the same periods and regions were used in the validation. TM data showed that 8% of the fires accounted for 74% of the surface burned, and these were larger than 10 km^2. The AVHRR area estimates had errors smaller than 15%. Statisitical analyses confirmed the consistency of the data. Regular use of the algorithm started in 2001 and its adaptation for MODIS data is also planned.