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III Conferência Científica do LBA

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12.9 **Coupling soil hydraulics to stomatal conductance; a mechanism for modelling the impacts of drought on forest gas exchange.** (Rosie Alice Fisher, Mathew Williams, Antônio Carlos Lôla da Costa, Maria de Lourdes Pinheiro Ruivo, *Patrick Meir*)

S7: Sessões Especiais - Estradas e Mudanças no Uso da Terra e Desflorestamento na Amazônia Brasileira. (*Roads, Land-Cover and Land-Use Changes in Brazilian Amazon*)

Coordenadores *(Chairs)*: **Eustáquio Reis, Marcellus Caldas**

13.1 **Understanding the Function of Roads in Land Cover Change** (Robert Walker, *Marcellus Caldas*, Stephen G Perz, Eugenio Arima)

13.2 **Determinantes e Tendências da Ocupação da Amazônia** (Eustáquio J Reis, *Ajax B Moreira*)

13.3 **Amazon Soybean Transport Costs** (*Maria del Carmen Vera-Diaz*, Robert Kaufmann, Daniel Curtis Nepstad)

13.4 **Land Use and Transportation Costs in the Brazilian Amazon** (*Diana Weinhold*, Eustaquio Reis)

13.5 **As mudanças sócio-ambientais na Amazônia Sul-Ocidental: Avalaiação pelas populações ao longo da Estrada Interoceanica no Estado do Acre, Brasil e no Departamento de Madre de Dios, Peru.** (*Elsa Huamán Mendoza*, Irving Foster Brown, Daniel Curtis Nepstad, Armando Muñante, Rodrigo Serrano, Denise Temporim Furtado, Sumaia Vasconcelos, Mercedes Peralta, Jessica Swansson, Socorro Pea)

13.6 **Roads: A Proximate or Underlying Cause of Deforestation?** (*Marie Scouvart*, Eric Lambin)

13.7 **Heterogeneity in Road-building Processes and Road Network Architecture: A Comparison of Two Amazonian Arenas and Implications for Projecting Future Land Cover** (*Stephen G Perz*, Marcellus M Caldas, Robert T Walker)

13.8 **Logging roads in the Amazon basin and forest fragmentation: modeling challenges** (*Eugenio Arima*)

13.9 **Basin-Scale Econometric Modeling I: road endogeneity and road impacts** (*Alexander Pfaff*, Eustaquio Reis, Claudio Bohrer, Juan Robalino)

13.10 **Basin-Scale Econometric Modeling II: spatial disaggregation and spatial impacts** (*Alexander Pfaff*, Eustaquio Reis, Claudio Bohrer, Juan Robalino)

S19: Sessões Especiais - Avaliações de Precisão e Suas Implicações Para o Monitoramento de Fogo e Desflorestamento (*Accuracy Assessments and their Implications for Fire and Deforestation Monitoring*)

Coordenadores *(Chairs)*: **I. Foster Brown, Jeffrey Morisette**

14.1 **Números de Desflorestamento Devem Incorporar Fundamentos de Medidas** (*Alberto W Setzer*)

14.2 **Public policy implications of accuracy assessment for fire and deforestation monitoring: Don't forget the error bars** (*Irving Foster Brown*)

14.3 **Incorporating the use of MODIS data into INPE deforestation mapping** (*Yosio Shimabukuro*, Ruth DeFries, Douglas Morton, Liana Anderson, Marcelo Lopes Latorre, Matthew Hansen, Ellen Jasinski)

14.4 **Representatividade e limitações dos dados da detecção orbital de queimadas do INPE** (*Alberto W Setzer*)

14.5 **Characterizing Vegetation Fire Regimes in Brazil Through Adjusted Satellite Fire Detection Data** (*Wilfrid Schroeder*, *Jeffrey Thomas Morisette*, Louis Giglio, Ivan Csiszar, Douglas Morton, Christopher O. Justice, João Antonio Raposo Pereira)

14.6 **Validation and comparison of Terra/MODIS active fire detections from INPE and NASA/UMd algorithms** (*Jeffrey Thomas Morisette*, Ivan Csiszar, Louis Giglio, Wilfrid Schroeder, Douglas Morton, João Antonio Raposo Pereira, Christopher O. Justice)

14.7 **Dinâmica das queimadas no Estado do Mato Grosso** (*Alexandre Camargo Coutinho*)

14.8 **Passive ground-based analyses for interpreting satellite fire data - Applications to AVHRR and MODIS active fire detections in Amazonia** (*Manoel Cardoso*, George Hurtt, Berrien Moore III, Carlos Afonso Nobre, Heather Bain)

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Moderate resolution satellite data, such as those from the EO-1 Terra and Aqua MODIS sensors, permit more rapid analysis of deforestation in the Brazilian Amazon than high resolution Landsat data due to their regional coverage with small data volumes. We evaluated the use of MODIS data to prioritize high resolution analysis in the INPE PRODES program by comparing MODIS deforestation maps generated by four different algorithms to 2002 INPE PRODES deforestation maps from Landsat ETM data. For 6 Landsat scene test areas, NDVI differencing and linear mixture model techniques were performed on both daily surface reflectance and 16-day composite surface reflectance MODIS products at 250 m resolution. Vegetation Cover Change (VCC) and Vegetation Continuous Fields (VCF) algorithms were also run on 250 m resolution MODIS data. The accuracy of each MODIS deforestation map with respect to the 2002 PRODES analysis was calculated as the percent of true positives, percent of PRODES deforestation area, and percent of PRODES deforestation polygons detected by polygon size. Results from all four algorithms show a high degree of potential to reliably identify new deforestation. The relative importance of minimizing false positives, maximizing deforestation area identified, or maximizing the percent of small (0.25-3 ha) deforestation areas detected will determine the most appropriate algorithm and data type. The accuracy and speed of MODIS data analysis techniques show a high degree of potential to assist priority setting for high-resolution analysis as part of operational deforestation monitoring at INPE.

14.4: Representatividade e limitações dos dados da detecção orbital de queimadas do INPE

Alberto W Setzer, INPE/CPTEC, asetzer@cptec.inpe.br (Apresentador / Presenting)

Este trabalho resume informações da representatividade da detecção de queimadas feita pelo INPE em imagens de satélites em relação aos focos observados por equipes de campo, assim como das limitações inerentes ao processo de detecção. Para tanto, são usados relatórios de usuários e comparações da detecção feita por satélites e sensores distintos. Por exemplo, no caso das unidades de conservação federais em 2003, apenas o satélite NOAA-12 detectou 88% das ocorrências registradas nas unidades. O uso de outros satélites aumenta esta representatividade, levando à conclusão esperada de que quanto maior o número de imagens, maior o número de detecções. Condições locais altamente variáveis como cobertura de nuvens, pequenos focos e fogo rasteiro no interior de florestas densas, e características do imageamento como horário da imagem, ângulo de visada, ruídos do sensor e na recepção, resultam em restrições no número de focos detectáveis. Características dos algoritmos de detecção que têm finalidade de eliminar falsos sinais de queimadas, tendem a minimizar o número de ocorrências registradas. E imprecisões no cálculo da posição real dos focos também adiciona limitações aos dados. A detecção orbital de queimadas deve ser considerada como o melhor dado possível, mas sempre subestimado em relação à realidade.

14.5: Characterizing Vegetation Fire Regimes in Brazil Through Adjusted Satellite Fire Detection Data

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The role of biomass burning on the terrestrial climate system has been widely studied over the last two decades. In particular, correctly characterizing the frequency and distribution of fire occurrence is a fundamental question for better understanding the resulting environmental impacts of burning. Satellite data have been developed and applied operationally to map vegetation fires over different regions of the globe. Hot spots detected by both the NOAA/AVHRR and NASA/MODIS sensors are used to report clearly apparent annual trends in fire activity through Brazil. However, while relative numbers of spatial and temporal distribution of hot spots correctly describe the situation, absolute values are known to underestimate total number of vegetation fires that occur at the surface. Satellite overpass time, cloud coverage and image acquisition characteristic are the main issues affecting detection performance and thereby the resulting fire statistics. Here we quantify the influence of clouds and viewing geometry on satellite fire detection statistics and develop a straightforward curve-fitting approach to adjust the total fire counts from MODIS-Terra, MODIS-Aqua and NOAA-12 throughout Brazil. The method compensates for day-to-day variation due to cloud cover and changing image acquisition geometry. The results of this adjusted number of fire counts are used to calculate monthly fire counts for each Brazilian state for the past four years to establish Brazilian fire regimes.

14.6: Validation and comparison of Terra/MODIS active fire detections from INPE and NASA/UMd algorithms

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The Committee on Earth Observing Satellites defines validation as "the process of assessing, by independent means, the