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HR: 1340h
AN: **B43A-0134**
TI: Uncertainties in Satellite Based Fire Emission Inventories in the Amazon
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AB: The uncertainties of developing satellite geolocation based fire emissions inventories for air quality models are discussed in this work. Various satellite hot spot detection and burn scar area products are routinely combined with emission factors to develop monthly and daily gridded fire emission inventories for both air quality modeling applications and global models Here, we compare the spatial autocorrelations between fire hot spots detected in the infrared by the Geostationary Operational Environmental Satellites (GOES) Wildfire Automated Biomass Burning Algorithm (WF ABBA), the Moderate Resolution Imaging Spectroradiometer (MODIS) 5 minute L2 thermal anomaly, and the NOAA-14 Advanced Very High Resolution Radiometer (AVHRR), and the Defense Meteorological Satellite Program (DMSP) visible channel for one month from 20 September 2002 to 20 October 2002 for an approximately 1000 km x 1000 km domain in Amazonia. Because of the differing overpass times of the polar orbiting satellites and the differing temporal and spatial resolutions of the sun-synchronous satellites and geosynchronous satellites, there is no discernable spatial autocorrelation between the detected hot spots on a 1 to 2.5 kilometer scale. Once these hot spots are counted and allocated to either 10 km2 or 20 km2 grid cells typically used for regional air quality modeling applications, spatial autocorrelation increases from 0.55 to 0.69, indicating that all the satellites examined here detect fires in the same general geographic locations. Further inventories of hot spots detected as a function of ecosystem type (GLCC version 2.0) in the GOES WF ABBA data are consistent with recent fire spots as a function of ecosystem type in the Global Wildland Fire Emission Model as reported by Hoelzemann et al in

2004. Comparison of the number of hotspots in South America month period, respectively 227,159 for GOES WF ABBA, 28,359 for MODIS L2 and 13,334 for AVHRR indicate that although these satellites observe similar spatial patterns, the number of hot spot detections observed by the different satellites differs substantially and therefore emissions modelers must take this into consideration. Examination of the fire area, maximum fire duration, and the diurnal pattern in the GOES WF ABBA dataset further indicates that no one satellite product, is appropriate for detecting small short duration fires. The uncertainties in emissions inventories can be reduced by using a combination of satellite products.
DE: 0394 Instruments and techniques
DE: 0399 General or miscellaneous
SC: Biogeosciences [B]
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