

## **2.005 Spatial and temporal distribution of agricultural fires in Mexico and Central America: A 14-year preliminary climatology.**

Early Career Scientist

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Abstract:

Crop residue burning is a common practice for reducing the volume of combustible materials resulting from agricultural activities in Mexico and Central America. A characterization of the spatial and temporal distribution of agricultural burning is required to assess its environmental impacts and to support fire management. The spatial and temporal variation of fires were investigated using combined multiple satellite observations, focusing on agricultural burning. The burned area approach combines 500 m Moderate-Resolution Imaging Spectroradiometer (MODIS) burned area product (MCD45) with a MODIS Land Cover product (MCD12Q1) and a map of North American land cover produced by the North American Land Change Monitoring System (NALCMS), from 2001 to 2014. Monthly fire counts were analyzed for eight countries, and three case studies within the Mexican territory were selected for further analysis. The smoke emission from crop burning were analyzed using the Ichoku and Kaufman method. The annual total number of fire counts in Mexico ranged from 30,489 to 141,061 during the 14 years. Agricultural fires on average accounted for 37% of total detected burns. In Central America, MODIS detected a total annual maximum of 26,012 fires in 2003 and a minimum of 7128 in 2012. Agricultural burning accounted for an average of 43% of all burning in Central America. While the spatial distribution of fires in the eight countries was similar among the 14 years, notable interannual variability was observed in the total number of fire events.

An analysis of the spatio-temporal distribution within Mexico indicates that agricultural fire activity exhibits different seasonality in the north, center and south. In the north of Mexico, monthly agricultural burning counts showed two peaks, one during April to May, and the other in November to December. In the center and the south of Mexico and in Central America, only the former peak is observed.