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Cartografía de la dinámica y la intensificación de los cultivos de arroz y maíz amarillo duro en Guayas y Los Ríos – Ecuador, mediante el Análisis de Series Temporales de NDVI derivadas de imágenes del sensor MODIS

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ABSTRACT

The most important transient crops in Ecuador are rice (forming an essential part of the basic food basket) and yellow corn (raw material for the feed's making for animal consumption). The implementation of methodologies that allow constant monitoring of these crops is important. This research aims to perform mapping intensification of these crops in two provinces of Ecuador. We have used the Normalized Difference Vegetation Index (NDVI) time series from MODIS sensor (MOD09A1) over a period of 14 years (2001-2014). The autocorrelation function (FAC) was calculated from the NDVI time series to determine the dynamics present in the crops. To observe changes in the intensification was divided the series of 14 years in 3 sub-periods (2001-04, 2005-09, 2010 -14) and the FAC was calculated for each sub-period. The results show that the crops present autocorrelations with two distinct dynamics, one with an annual cycle and other with two cycles per year. Rice presented these two dynamics, while the annual cycle dynamics prevailed in yellow corn. Some changes between the sub-periods analyzed were observed, with a significant increase in rice pixels with 2 cycles going from 6.4% of pixels in the sub-period 2001-04 to 19.5% in the sub-period 2010-14. Validation pixels 68% of rice and 85% of yellow corn pixel coincided with official data. This does not happen in the pixels mapped as 2 cycles where the percentages are lower. Despite the validation made, this methodology has great potential for differentiation of crop cycles and its intensification in areas where cloud cover does not allow any differentiation.

Keywords: Autocorrelation function, MODIS, NDVI, time series, crop's dynamic, monitoring, rice crop, yellow corn crop.