

**Suggested Topics:** Remote Sensing Applications: Agriculture & Crops

**Paper Title:** Phenology-based classification of major crop areas in Central Luzon, Philippines from 2001-2013

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**Abstract:**

Annual crops such as rice, corn and sugarcane are the major source of livelihood for a third of the Philippine population and in view of a changing climate and increasing demand for food, information on the spatial extent and distribution of these crops are important for farmers and policymakers alike. This paper will present a method to map annual crop areas in the Central Luzon Region of the Philippines using time-series Normalized Difference Vegetation Index (NDVI) maps derived from the Terra-borne MODIS 250-m resolution 8-day surface reflectance product (MOD09Q1) from 2001-2013. We developed an algorithm using the following steps: 1) Reference points for classifier training and subsequent accuracy assessment were obtained using a combination of *in situ* observations, high resolution imagery interpretation from Google Earth and land cover classification maps; 2) the algorithm applied a filter to smoothen the time-series NDVI of pixel-wise observations and removed spikes and outliers; 3) the processed dataset was then used to extract phenological or seasonality parameters including start of season, end of season, peak of season, and length of growing season; and 4) a supervised classification scheme using the phenological parameters as inputs was implemented using an artificial neural network trained using scaled conjugate gradient backpropagation. Biannual maps were produced using the algorithm to reflect the changing crop extent through the wet and dry seasons. Crop area for each map was quantified and compared between years.

**Keywords:** MODIS, neural network, land cover classification, crop area maps