

## Phenological analysis for cultivated area in Northern Asia using MODIS NDVI data

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### Abstract

Identification of cropland distribution is important task to agricultural management, land degradation therefore to making social and economic decisions. Although accurate identification of cultivated area from natural vegetated area is not easy because of their similar characteristics in semi-arid zone. The vegetated coverage is characterized by a short growing season, with a rapid transition from vegetation dormancy to activity.

Analysis of phenological stages and growth period using remote sensing data has long been used at regional to global scales. Past large scale mapping efforts have developed mostly at low spatial resolution and have low accuracy in some similar classes. The development of a large-scale crop mapping methodology is challenging because it requires remotely sensed data that have large geographic coverage, high temporal resolution, adequate spatial resolution relative to the typical field size, and minimal cost. Recent studies have indicated that the Moderate Resolution Imaging Spectroradiometer (MODIS) data has high potential for mapping crops and estimation of seasonal biophysical changes of vegetation. Time-series VI data from MODIS are produced at a moderate spatial resolution and high temporal resolution attributes that corresponding to relatively homogeneous land cover types and major phenological events.

This study used multi-temporal NDVI data to provide needed vegetation phenological pattern. 16 day composite MODIS VI grid data (MOD13Q1) from NAS Terra/MODIS (AM-1) satellite is selected and it acquired from Land Processes Distributed Active Archive Center (LP DAAC) located at the USGS Earth Resources Observation and Science (EROS) Center at free of charge. MODIS NDVI data consists of tiles 10 degree by 10-degree in HDF format at 250 m resolution. This data is validated at stage 2 and totally 12 tiles covering for h21v03, h27-v04, and h22 to h26, v03 to v04 tiles are acquired for 2000 year. Phenology based results indicate that the consequence MODIS images have high potential for large scale monitoring.

Keywords: cultivated area, semi-arid area, cropping phenology, MODIS NDVI data