

# EVALUATION OF TIME SERIES OF MODIS DATA FOR TRANSITIONAL LAND MAPPING IN SUPPORT OF BIOENERGY POLICY DEVELOPMENT

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## ABSTRACT:

Earth observation-based operational environmental assessment often requires images with a large coverage, frequent revisiting and adequate spatial resolution. MODIS (Moderate Resolution Imaging Spectroradiometer) is a key instrument aboard the Terra and Aqua satellites. Because of its medium spatial resolution, daily coverage, and large swath, its data are suitable for environmental studies at a regional level. With the daily revisit capability, each coming with 7 bands, MODIS has generated a large volume of time-series data, making it a challenge for the remote sensing community to efficiently use the information. Multi-temporal analysis methods have been developed to take advantage of the time-series information for various applications. However, how to select a subset of operationally manageable images from the large volume remains a challenge. To take up this challenge, we adopted a data mining strategy and developed an optimization method to extract information for land cover mapping from combination of MODIS bands with different time stamps. In particular, we used 10 days cloud-free composites in the vegetation-growing season from April to October. In total, there are 3 cloud-free composites per month, and 7 bands per composite. From the cloud-free composites, we evaluated all the possible time and band combinations for land cover discrimination based on an analysis of differences in vegetation phenology using the spectral information. The land cover maps generated based on the combinations using a decision tree approach were evaluated against field ground truth data. Our result reveals that the method that we have developed is efficient to identify the combinations of subset data from the large volume of MODIS time-series data. Also, the method produces higher accurate land cover maps than using a single date image or any random combination of multi-temporal MODIS images.

**TOPIC:** Land cover classification

**ALTERNATIVE TOPIC:** Remote sensing applications