Geophysical Research Abstracts
Vol. 16, EGU2014-11779, 2014
EGU General Assembly 2014

An assessment on the MODIS quality data over the Iberian Peninsula (Southern Europe)

Margarita Huesca (1), Silvia Merino-de-Miguel (2), Víctor Cicuéndez (1), Javier Litago (3), and Alicia Palacios-Orueta (1)

(1) Universidad Politécnica de Madrid, Departamento de Silvopascicultura. Madrid, Spain, (2) Universidad Politécnica de Madrid, Departamento de Construcción y Vías Rurales. Madrid, Spain, (3) Universidad Politécnica de Madrid, Departamento de Estadística. Madrid, Spain

Satellite remote sensing may provide land surface processes observations at high temporal frequency over long periods of time. However, many influences have a bearing on the spectral properties which may be derived from multi-spectral data. The MODIS (Moderate Resolution Imaging Spectroradiometer) Land Science Team provides quality assessment (QA) data. QA is key information for the correct interpretation of remote sensing products since we need to discrimite between real changes on the Earth surface and satellite product artefacts (Roy et al., 2002).

The present work focuses on evaluating the quality of the MOD09A1 (Surface Reflectance 8-Day L3 Global 500m) product over the Iberian Peninsula during the period 2000-2008. The quality was estimated in terms of identifying the most important noise sources that might distort the data as well as identifying the areas and seasons where they were dominant. The specific objectives were: (i) to select the most relevant QA parameters based on their frequency over the study area, (ii) to analyze the spatial distribution of the QA parameters and stratify the territory based on this information, and (iii) to analyze the temporal distribution of the QA parameters.

The quality data founded within the MOD09A1 product provides information: (i) at the pixel level, (ii) per reflectance band and (iii) for the whole file. In particular, QA is stored in two different layers or bands, one related to each band and based on sensor characteristics and image acquisition (named ‘Surface Reflectance Data’ QA layer), and the other one related to each pixel and based on external conditions (named ‘Surface Reflectance Data State’ QA layer). The present work focuses only on this second one.

The QA parameters were analyzed in terms of the number of dates where we found low quality pixels, and of the presence of long gaps (four or more consecutive low quality dates). The next step consisted of using the number of low quality dates and the number of pixels that belong to long gaps to stratify the study area. Finally, the mean annual pattern was used to assess the generic intra-annual evolution of the number of low quality dates and log gaps within the classes that showed the worst pixel quality conditions. The intra-annual evolution was evaluated in order to select those periods of the year when each quality parameter was dominant.

Results showed that the most significant quality flags in the study area were clouds, cloud shadows, pixels adjacent to cloud and aerosols; in both the spatial and temporal frequency terms. Besides, developed maps provided a useful tool in the selection of the best method to improve the quality of the MODIS time series (e.g. spatial and temporal interpolation, function fitting, pixel removal, etc).

References:
David P Roy, Jordan S Borak, Sadashiva Devadiga, Robert E Wolfe, Min Zheng, Jacques Descloitres. 2002. The MODIS Land product quality assessment approach. Remote Sensing of Environment, Volume 83, Issues 1–2, Pages 62–76.