GLOBAL WATERPACK - TIME SERIES ANALYSES TO ASSESS SPATIO-TEMPORAL VARIABILITY OF INLAND WATER BODIES

I. Klein [a, *], A. Dietz [a], U. Gessner [a], C. Kuenzer [a], S. Dech [a]

[a] German Aerospace Center (DLR), Earth Observation Center, German Remote Sensing Data Center,
Oberpfaffenhofen, 82234 Weßling, Germany – igor.klein@dlr.de

THEME: Forests, biodiversity and terrestrial ecosystems

KEY WORDS: Water Detection, Time Series Analyses, Dynamic of Water Bodies, MODIS

ABSTRACT:

Natural lakes, lakes under strong anthropogenic influence and artificial reservoirs feature strong intra- and interannual variability in their surface extent. The variability reflects meteorological and environmental conditions as well as human impact. Knowledge of spatio-temporal patterns of such inland water bodies is crucial for many reasons. Since many water bodies are sensitive to short and long term alteration such information might be helpful for water management, climate variability debate and its consequences. In this study we present an approach to detect water bodies on daily scale using dynamic threshold and time series of MODIS data. In first step, daily MODIS near infrared data are used to detect open surface water, whereas a dynamic threshold is calculated for each individual data tile. In second step, the entire time series is being utilized to remove misclassification due to cloud shadow and also to replace cloud covered and no data pixels by temporal closest classification under clear sky conditions. We applied the method for the year 2013 on global scale revealing spatial variability of many water bodies as well as regularly flooded areas. The Global WaterPack product features 250m spatial resolution and includes information such as amount of days classified as water per year, beginning and end of flooding period.

---

* Corresponding author