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8 years water bodies monitoring analysis using MODIS over the African continent

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Detecting water bodies in nearly real time over the whole Africa is a challenge addressed by the Geoland-2 project. This information was found critical by end-users for natural resource management as well as for environmental monitoring. Non-permanent water bodies dynamic is also expected to be affected by climate change and requires appropriate system development for operational monitoring.
In the framework of Geoland-2 project, a water bodies detection algorithm based on a standardized multispectral transformation has been developed. The processing of an 8 years detection archive provided sufficient detection information to characterize the normal "absence or presence" of water along the season and thus to build a reference map for each 10-days period along the year. Comparing detections with this reference allows to identify dry or wet anomalies and to characterize their duration. Mapping and analysing these anomalies represents valuable information both for regional users and for research purposes. This paper presents the application of the methodology to a large dataset and the analysis of the anomalies mapped.
The methodology developed is suited to detect the water occurrence in various ecological conditions and appears to be more generic than classification approaches over continental extent. The methodology was applied on MODIS 250 m Aqua and Terra daily Reflectance data (MYD09 and MOD09) acquired for the African extent continuously from year 2004 to 2011. The processing and interpretation of this challenging dataset bring to light regional trends over time.