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MWBS 2015 Conference

Day 2, Thursday 19 March 2015

2.1 WATER BODIES IN TEMPERATE TO TROPICAL REGIONS

Chairs: A. Hartley, Met Office / A. Mangin, ACRI

09:00	Mapping Water for Europe: Operational Mapping and Data Products in the Context of Copernicus: EU Hydro and High Resolution Layer on Water Bodies. Status, Outline, Developments, Lessons Learned	Langanke, Tobias	EEA, Denmark
09:20	Water quality of lakes over Europe using Sentinel-2: Atmospheric Correction and Validation	Mangin, Antoine	ACRI, France
09:40	Automated Mapping of Surface Water Bodies for Operational Applications in South Africa using Landsat 8 Satellite Imagery	Mhangara, Paidamwoyo	SANSA, South Africa
10:00	The temporal mapping of water bodies from the perspective of climate modelling	Kergoat, Laurent	GET, France
10:20	Monitoring the Water Balance of Small Reservoirs in Semi-arid Regions from Space	Annor, Frank Ohene	Delft University of Technology, Netherlands

2.2 WETLANDS

Chairs: M. Paganini, ESA-ESRIN / K. Weise, Jena-Optronik GmbH

11:10	Assessment of Wetlands Extend and Sensitivity of	Georgievski,	Max Planck
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Monitoring the Water Balance of Small Reservoirs in Semi-arid Regions from Space

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Multipurpose small reservoirs (surface from 1 to 100 ha) have crucial roles for many livelihoods in rural areas of semi-arid regions like Northern Ghana, Southern Burkina Faso and Zambia. The correct representation of the hydrological functions of the small reservoirs is important for regional (hydro-) climate models and scaling out the intervention. The application of remote sensing techniques to provide meteorological and physical parameters (surface area and volume) over the water surface, where field-based information is rarely available due to logistical and technical constraints, will greatly improve the understanding of the water balance and hydrology of small reservoirs. Open water evaporation as an important component of small water bodies hydrology, remains a difficult and complex process to measure or estimate mainly due to the fact that the required meteorological parameters are rarely measured over these small water surfaces.

In this study the trends in water surface fluctuations, and thereby water storage in small reservoirs in the Upper East Region (UER) of Ghana were examined. This was done using Radarsat-2 and Landsat-8 datasets from November 2012 till April 2014. Assuming minimal seepage condition during the observation period (when these reservoirs were not used), the water balance of small reservoirs was parameterized to estimate evaporation losses and compared with evaporation estimates from numerical methods based on ground-based (land-based) measurements. The measurements from the field using an Eddy Covariance (EC) System over the water surface correlates very well with the satellite measurements using time series of satellite observations and the numerical (evaporation aerodynamic and energy balance) methods. The results show a great potential for using a combination of Sentinel-1 and Sentinel-2 data sets for operational management of small reservoirs to enhance food production with enhanced irrigation scheduling.

Keyword: *Small Reservoirs, Evaporation, Water balance, Sentinel-1, Sentinel-2, Semi-arid, Food Security.*