

WATER EXTENT MONITORING EXPLOITING MR AND HR REMOTE SENSING DATA: SYNERGY, CONSTRAINTS AND LIMITS

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EO MR and HR imagery, particularly SAR data, are powerful tools to monitor water extent that allow to understand the mechanism of complex key ecosystems such as Poyang Lake, considered as a key element for flood natural control and reduction as well as major resources within the Yangtze middle basin. To assess and validate a such long monitoring (2000 to 2011 with an image every 10 days), a particular attention was paid on data quality : the assessment of water extent synergy derived from multi-resolution dataset, and the impact of meteorological conditions, wind (inducing an increasing of surface roughness) and rain, on the SAR signal quality with bands C and X.

The cross comparisons of water surfaces extracted from Beijing-1, ENVISAT ASAR GMM, WSM and MERIS data are concordant despite the difference of resolutions. The best synergy was obtained with Beijing-1 and ENVISAT WSM. In average, 80% of water extracted on the coarser resolution data is recognized on the better resolution data. But limitations exist; results are less satisfying with GMM.

Meteorological conditions can disturb a SAR signal. Over a water surface, wind or rain can modify the smoothness of the surface and thus its backscattering. Clouds can also disturb SAR signals and shadow areas appear like on optical data. These case are very rare with band C (1/250) but much more regular on band X (1/15). By the way, lot of precaution have to be taken for interpreting such X-band SAR data.