



A multi-sensor RST based approach for flooded areas detection and monitoring: the November 2010 Veneto region flood.

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In the last years satellite remote sensing applications in hydrology have considerably progressed and an increasing attention has been placed on floods, which have strong environmental and social impacts and play an important role in the hydrological cycle.

In particular, floods detection and monitoring represent a relevant problem in risk management, above all for civil protection activities, which need of timely, accurate and updated information about the onset, extent, intensity and duration of floods for limiting losses of life, human suffering and damage and for optimizing resources organization and deployment.

In recent years, flood mapping and monitoring efforts have exploited the advantages of both optical and microwave remote sensing technologies for improving risk management and assessment.

Optical sensors aboard meteorological satellites, like NOAA-AVHRR (National Oceanic and Atmospheric Administration-Advanced Very High Resolution Radiometer) and EOS-MODIS (Earth Observing System-Moderate Resolution Imaging Spectroradiometer), thanks to their high temporal resolution, can ensure, in absence of clouds, a frequent monitoring of flood-affected areas.

Passive microwave satellite data, like those acquired by AMSU (Advanced Microwave Sounding Unit), which flies aboard NOAA satellites, and by AMSR-E (Advanced Microwave Scanning Radiometer - EOS), despite their coarse spatial resolution, present a great potential for soil wetness variability and flood monitoring thanks to the microwave signal capability to penetrate through clouds and provide all-day and all-weather data. Moreover, microwave radiances show a general high sensitivity to moisture presence in the superficial layers of soils.

In this work, results achieved by using a multi-sensor system for flood detection and monitoring, based on the RST (Robust Satellite Techniques) approach, will be presented. RST is a general methodology for multi-temporal satellite data analysis which, by means of a change detection technique, is able to identify anomalous values (both in space and time domains) of the observed signal.

Data acquired by the above cited sensors will be used for studying the flood which hit the Veneto region, in early November 2010, involving 121 villages and causing severe damages and about 8.000 displaced people.

The main purpose of such a work is the assessment of RST capability in detecting and monitoring flooded areas in case of events of medium intensity.