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Combining of Radar altimetry, and MODIS imagery for the monitoring of surface water over central Asian lakes and reservoirs.

J-F Crétaux, M. Bergé-Nguyen, and A. Cazenave
Legos/Cnes, 18 Av Edouard Belin, 31400 Toulouse, France

A method of wetland mapping and flood event monitoring has been developed on the basis of a satellite multi-sensor data combination. This includes radar altimetry in a multi-mission framework (Topex / Poseidon, Jason, GFO and Envisat), and surface reflectance measurements from the MODIS instrument onboard Terra satellite. It has been applied to the monitoring of Aral Sea basin water bodies: North and Small Aral, delta of Syr Darya and Amu Darya, desiccated dry land around the Aral Sea, and reservoirs along the rivers.

MODIS data provide every 8 days, surface extension of free water, from 2000 to 2007, with a spatial resolution of 500 meters. Altimetry provides level variations of the water bodies studied. Some in-situ data were also taken into account in the study that provided external forcing for total water budget of the basin (river runoff, precipitation, evaporation). A precise Digitized elevation model, and results from field campaign carried out by other groups are also used to determine volume variation of Aral Sea.

Based on these different techniques we have determined the extent of water within the Aral Sea basin, as well as volume variations, which is key parameter in the understanding of hydrological regime in ungauged basin, where this type of information may be used as input of hydrodynamical model.