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Droughts and floods monitoring in Poland with SMOS, SEVIRI and model data

A.Z. Kotarba (1), K. Stankiewicz (2), J. Słomiński (1), E. Słomińska (1), and W. Marczewski (1)

(1) Space Research Centre of Polish Academy of Science, Warsaw, Poland (akotarba/jan/ewa/wmar@cbk.waw.pl), (2) Warsaw School of Information Technology, Warsaw, Poland (krystyna.stankiewicz@gmail.com)

Droughts and floods represent the extreme cases of hydrological regime. Both significantly influence ecological processes in the environment as well as socio-economic situation of human activity. Measurements of soil moisture and rainfall is being recognized as fundamental for droughts and floods monitoring. We used Soil Moisture and Ocean Salinity (SMOS) L2 soil moisture data and Spinning Enhanced Visible and InfraRed Imager (SEVIRI) rain rate approximation to evaluate the intensity and extend of droughts/floods events in Poland in 2010 and 2011.

SEVIRI Multi-Sensor Precipitation Estimate rain rates were used for calculation of monthly rain accumulation (24 SEVIRI L2 datasets per day), then projected to match SMOS spatial reference. Based on SEVIRI data, monthly sum of precipitation was estimated for each SMOS DGG cell within area of interest (the ROI covers Poland and the closest neighborhood). At the DGG level, SMOS SM and SEVIRI precipitation data were compared for each month since May 2010. Nearly two year series provided a background for droughts and floods events.

Final L3 products of SMOS SM and SEVIRI precipitation were compared with operational, traditionally-developed drought risk maps, in order to evaluate the degree of agreement between remotely sensed products and models calculated with surface-based measurements only.