



Calibrating ensemble weather forecasts for warnings of extreme weather events

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Finnish Meteorological Institute (FMI) is participating in the EU-project I-REACT (Improving Resilience to Emergencies through Advanced Cyber Technologies) in which one objective is to improve European level extreme weather event detection. I-REACT aims to develop a European-wide platform to integrate emergency management data coming from multiple sources. The proposed system will be targeted to public administration authorities, private companies, as well as citizens in order to effectively prevent and react against natural disasters.

The main role of FMI in the project is to bring weather and climate expertise available to other project partners and eventually to end users. FMI offers some observations, and statistically calibrated ensemble weather forecasts from ECMWF and GLAMEPS (and MetCoOP MEPS) models with lead times from a few hours to two weeks for whole European region. FMI will develop and provide the forecasted occurrence risk maps for heavy precipitations, high wind speeds, as well as extreme cold and heat spells in terms of probabilities. In addition, FMI will provide calibrated ensemble forecasts to other project partners who are providing fire and heat wave hazard mapping services to the I-REACT system.

Since ensemble forecasts tend to be underdispersive and biased they are calibrated with statistical methods. For temperature and wind speed forecasts non-Gaussian regression (NGR) is used. The method for calibration of precipitation amount forecasts is still under development. The calibration methods, as well as verification tools, applied in this project are jointly developed within Hirlam-Aladin co-operation. A simple data fusion technique will be applied to merge the different data sources to a seamless data stream for impact applications.

The I-REACT system will be validated through in-field demonstrations to receive feedback from end-users. Five different demonstration areas are decided to be the Po river basin (ITA), Malta, Catalonia (ESP), Southern Ostrobothnia (FIN), and two areas in UK. Finally the system will be provided for whole European region. One goal in the project is to develop I-REACT mobile application for smart phones and tablets that will be used by citizens.