

Presentations on Recent Work in Short-Range Quantitative Precipitation Forecasting and its Application in Hydrologic Prediction in the Czech Republic

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Nowcasting of precipitation in the Czech Republic - application

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A statistical-advective model that produces probabilistic quantitative precipitation forecasts for the Czech Republic has been developed and tested. It is designed to provide input to hydrologic models for flood forecasting. The model incorporates input from operational numerical prediction model forecasts, radar, lightning, and satellite infrared observations. The remote-sensor input is forecasted in time by both advective (wind-driven) and extrapolative methods. All inputs have been blended to achieve optimum skill. Incorporation of numerical prediction model output enables the system to generate as well as extrapolate convective storms. The relative merits of the advective and extrapolative forecasts will be presented

Comparison of nowcasting of convective precipitation by statistical and NWP models

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Two precipitation nowcasting methods are compared. The first method uses the NWP model COSMO with assimilation of radar reflectivity and satellite data. The second applies the statistical nowcasting model (NOW) to observed radar, lightning and satellite data, and prognostic data from a low-resolution NWP model. The nowcasting methods are compared for three convective events of locally heavy precipitation.

A simple categorical verification of the forecasts sensitive to the position of the precipitation area is used. A small shift of the forecast area may therefore significantly decrease the skill score.

Results show that both methods have limitations. The NOW model is able to predict further development of already observed precipitation but the forecast is not satisfactory when there are no indications of convective activity contained in the predictors. The physical model does not have this limitation, but the forecasts significantly depend on the initial and boundary conditions and on assimilated data. When assimilation is not used, the COSMO model forecasts are typically poorer than the NOW model forecasts.

Rainfall-runoff model HYDROG and application of radar data in hydrological forecasts

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HYDROG is a distributed event rainfall-runoff model, which has been used routinely in the Czech Hydrometeorological Institute regional offices at Brno and Ostrava since 2000 for operative discharge prediction in the Odra and Morava catchments. The 48h discharge forecast is calculated for 41 river profiles every day (18 of them are published on a web site). The rainfall input data are created by raingauge measurements together with ALADIN numerical model precipitation forecasts.

The product of a radar-raingauge merging algorithm became a standard part of input data in 2004. The 3-h COTREC radar-based extrapolative precipitation forecast has been calculated operationally for these catchments since 2007. This product can also be used as an alternative predicted precipitation input.

This presentation will describe the HYDROG model show some examples of application of above mentioned radar products.