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Recent developments on the calibration of LISFLOOD model for the european flood alert system: case-study on The March-April 2006 flood event in the Czech Part of the Elbe River Basin

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The European Flood Alert System (EFAS) is under development and running in pre-operational mode at the Joint Research Center (JRC) of the European Commission to support Member States' activities in flood forecasting. The current system is set-up for the whole Europe on a 5-km grid-based spatial resolution. Selected pilot catchments, like the Elbe catchment, have also being set-up on a 1-km grid, with more detailed calibration and validation procedures based on high-resolution meteorological and hydrological data. This paper presents a case-study on the performance of the EFAS forecasting system for the recent flood event observed late March-early April 2006 in the Elbe/Vltava catchment. From 27^{th} March to 10^{th} April 2006, the Elbe catchment was hit by severe flooding due to high amounts of snow melting and rainfall, strongly affecting the Czech part of the Elbe catchment, as well as the Elbe River at the Germany/Czech Republic border. We investigate the first results obtained through the comparison of observed hydrographs from local gauging stations and the forecasts obtained with the recent developed 1-km set-up and calibration of the hydrological LISFLOOD model used in EFAS. Calibration was carried out for three distinct time periods: 1993-1998, 1997-2000 and 1999-2002. When calibrating for one period, the other two were selected for validation. All simulations were performed at a daily time step. The effect of increasing spatial resolution and of a calibration with local discharge data and more detailed hydrologic information on the parameters of the

rainfall-runoff model is assessed. The analysis shows that although high levels were already well forecasted by the current 5-km system for the core period of the flood event (29^{th} March-8^{th} April), a great benefit could be expected from the introduction of a finer calibrated model into the forecasting system to better capture the magnitude and the timing of floods. The study highlights the importance of more detailed modeling in order to better reproduce the flood volume and quantify the part of runoff due to snow melting, the physical process dominating this type of flood event.

Keywords: floods, forecasting, hydrologic modelling, calibration, Vltava/Elbe catchment.