AOGS 2006

New Approaches and Perspectives in Flood Forecasting

EZIO TODINI
University of Bologna

In recent years, the availability of new technological tools based on RADAR and Satellite technology opened new perspectives in flood forecasting. Geomorphologic data, land use and soil maps are today widely available on GIS format together with distributed rainfall fields produced using rain gauges, RADAR or Meteosat images. In addition quantitative rainfall field predictions are generated using nowcasting techniques or meso-scale atmospheric models as single predictions or as part of ensemble predictions. This new availability of data combined with the increased power of available computer resources, promoted the development of new technologically advanced distributed physically based rainfall-runoff models, such as LISFLOOD or TOPKAPI, that can be directly linked to the distributed rainfall forecasts in order to generate flood forecasts. Unfortunately, the level of uncertainty involved in quantitative rainfall field forecasts is still quite large and becomes larger with the increasing lead time. Therefore, the aim of current research approaches is to assess and to account for all the sources of uncertainty that converge in flood forecasts and to estimate the so called "flood forecasting predictive uncertainty". The predictive uncertainty is the key issue to be used in decision schemes, such as for instance relevant to the release from a reservoir or the issue of a flood alert. The paper will be concluded by a presentation of the most recent research programmes funded by the European Union in the domain of flood forecasting and of the International Programme Hydrological Ensemble Prediction EXperiment (HEPEX).