EUROPEAN COMMISSION – WFD COMMON IMPLEMENTATION STRATEGY
WG F Thematic Workshop on Implementation of the Floods Directive 2007/60/EC
"FLASH FLOODS AND PLUVIAL FLOODING"
26th – 28th May 2010, Cagliari, Italy

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NUMERICAL HYDRO-METEO-MARINE MODELLING AT ISPRA IN THE CONTEXT OF THE FLASH-FLOOD EVENTS MONITORING, FORECASTING AND STATISTICAL ANALYSIS ACTIVITIES

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Abstract

For its institutional purposes, from the year 2000, ISPRA runs an integrated numerical model chain, the Hydro-Meteo-Marine forecasting System (SIMM –*Sistema Idro-Meteo-Mare*). It consists of a cascade of meteorological (the hydrostatic BOlogna Limited Area Model; BOLAM), wave propagation (the spectral Wave Model; WAM), and sea elevation (a 2-D version of the Princeton Ocean Model and a finite-element model on the Venice lagoon; POM and VL-FEM) models operational over the whole Mediterranean area with a horizontal grid spacing about 10 km and telescoping to the Venice Lagoon (since forecasting the *acqua alta* phenomenon is, among the others, one of the main tasks of SIMM). The physically based, fully distributed, rainfall-runoff model (TOPKAPI) model is also integrated, in a research configuration, into the system over the Reno (Central-eastern Italy) and Adige (North-eastern Italy) river basins.

The SIMM operational products are a key element for the activities of the ISPRA's Department for Protection of Inland and Marine Waters, including intense and damaging events monitoring and study, development of statistical methodologies suitable for flood risk management tasks, water

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resources assessment, etc. These activities have been often developed in the framework of WMO and EU-funded international projects concerning operational hydro-meteorology tasks and, in particular, flash flood issues. These projects have focussed on either monitoring and modelling events in specific problematic areas (such as the Alpine region within FORALPS – INTERREG IIIB Alpine Space and MAP D-PHASE), developing flood forecasting in itself (INTERREG IIC Floods, HYDROPTIMET – INTERREG IIIB MEDOCC), improving rainfall observational analyses and forecast verification methodologies (VOLTAIRE – FP5), reconstructing the hydrological cycle (HYDROCARE – INTERREG IIIB MEDOCC), or monitoring, coordinating and funding flood research projects at European level (CRUE ERA-Net – FP6). Some results of these activities, relevant to the Workshop aim, are presented here.