



## **Modelling floods at different catchment scales: an inter-comparison between a mixture of hydrologic and hydraulic models**

S. Barbero(1), G. Boni(2,3), A. Crosta(4), L. Ferraris(2,3), S. Gabellani(2), D. Rabuffetti(1), N. Reborà(2)

(1) Arpa Piemonte, Area Previsione e Monitoraggio Ambientale, Torino, Italy, (2) CIMA - Università degli studi di Genova, Italy, (3) DIST, Università degli Studi di Genova, Italy, (4) Consorzio Intecno-DHI, Torino, Italy

The choice of a set of mathematical models to reproduce a flood event should be based on a variety of considerations. Among them, one of the most important is models capability to reliably reproduce the main physical underlying processes, which affects flood formation and propagation at catchment scale. The relative importance of these processes changes according to the river basin spatial scale. In the present work, performances of a combination of lumped, semi-distributed hydrological models and a 1-D hydrodynamic model, is analysed at different spatial scales. Several combinations are tested. The best model configuration for every analysed catchment scale is singled-out. Models used here are MIKE 11NAM, MIKE 11DRiFt and MIKE 11HD. The test case is the Tanaro river basin in Northern Italy. The performance is tested in two ways. First the capability of different model configurations to reproduce the observed discharges is analysed. Second a probabilistic flood forecast chain is simulated and the capability of the model configurations to provide useful information to the decision maker is tested.