



Scaling based study of the relation between rainfall and surface runoff across scales

M. Isabel P. de Lima (1,2), Fátima Espírito Santo (3), and Álvaro P. Silva (3)

(1) Institute of Marine Research (IMAR) and Marine and Environmental Sciences Centre (MARE), Portugal, (2) Department of Civil Engineering, Faculty of Science and Technology, University of Coimbra, Coimbra, Portugal (iplima@uc.pt), (3) The Portuguese Sea and Atmosphere Institute, I.P., Meteorology and Geophysics Department, Lisbon, Portugal

The full understanding of the statistics and regimes in hydrological variables requires the study of hydrological processes across a large range of temporal and spatial scales. Scaling, multifractal approaches and methods provide adequate frameworks to these studies, in offering tools to adequately quantify the variability in hydrological processes across scales, which include rainfall and river flows - the focus of our study. These processes can then be modeled using a limited number of parameters, which are nevertheless able to describe the huge dynamic fluctuations that are typical in rainfall and river flows, spanning wide ranges of scales in time and space. In this presentation we show results from scaling and multifractal analysis of rainfall and surface flow data from Portugal (western Iberian Peninsula), and testing the statistics in order to investigate relations between these two processes across time scales. These relations are particularly important to assess and monitor the development of moderate to extreme hydrological events occurring at different scales.