



Main drivers of flood-risk dynamics along the Po River

Alessio Domeneghetti, Francesca Carisi, Attilio Castellarin, and Armando Brath

University of Bologna, School of Engineering, DICAM, Bologna, Italy (alessio.domeneghetti@unibo.it)

The increasing frequency with which floods damages are recorded, or reported by media, strengthen the common perception that the flood risk is dramatically increasing in Europe and other areas of the world, due to a combination of different causes, among which climate change is often described as the major factor. However, there is a growing awareness of how anthropogenic pressures, such as uncontrolled urban and industrial expansion on flood-prone areas, may strongly impact the evolution of flood-risk in a given area, increasing potential flood damages and losses. Starting from these considerations, our study aims at shedding some light on the impact and relative importance of different factors controlling the flood risk. Focusing in particular on the middle-lower portion of the River Po, we analyze the evolution of flood hazard in the last half century referring to long streamflow series for different gauging stations located along the study reach (~450 km), while the modification of anthropogenic pressure is evaluated by referring to land-use and demographic dynamics observed from 1950s. Our study proposes simplified flood-vulnerability indices to be used for large scale flood-risk assessments and, on the basis of these indices, (1) we assess the importance of the different elements contributing to the definition of flood risk and (2) represent the evolution of flood risk in time along the middle and lower portion of the River Po.