



How close do we live to streams and rivers? A spatio-temporal analysis of flood risk vulnerability using nightlight data

Serena Ceola (1), Francesco Laio (2), and Alberto Montanari (1)

(1) University of Bologna, DICAM, Bologna, Italy (serena.ceola@unibo.it), (2) Politecnico di Torino, Dipartimento di Idraulica, Trasporti e Infrastrutture Civili, Torino, Italy

Flood is the first cause of human fatalities and economic losses among natural disasters, see for instance the recent flooding event in Sardinia (Italy) last November. Significant political efforts (e.g. the EU Flood directive 2007/760/EC) and a continuous scientific progress on flood risk assessment have been already achieved. However a spatially and temporally detailed analysis on the hydraulic vulnerability to floods is still lacking, when considering in particular the human pressure close to fluvial water-bodies and its interactions during floods. To this aim we use here nightlight data to interpret the anthropogenic presence. More specifically, we map nightlight trends in correspondence of the river network from 1992 to 2010, with a spatial resolution of nearly 1 km. First we start from the European continent, and then we focus on single countries. Our results show an overall temporal enhancement of artificial luminosity, thus revealing an increased vulnerability of human settlements to flooding events. Snapshots on single areas characterized by largest nightlight increment and decline will be finally shown, in relation to positive demographic trends and the development of policies against light pollution, respectively.