Geophysical Research Abstracts,
Vol. 11, EGU2009-6599, 2009
EGU General Assembly 2009

Evaluation of risk to flooding for built environment under extreme sea level rise: Varna Bay (Bulgarian Black Sea coast)

A. Palazov, H Stanchev, and M Stancheva

Institute of Oceanology, Bulgarian Academy of Sciences, Varna, Bulgaria (palazov@io-bas.bg)

Over the last decade some extreme events, including storm surges, sea level rise and subsequent river/sea floods have become one of the most crucial problems along the coasts. With regard to currently changing global climate these events are expected to increase in their frequency and intensity. For example sudden sea level rise, resulting of severe storms, tsunamis or seiches and often combined with heavy rainfalls, would be much more hazardous for low-laying coastal territories. Beside short-term duration of such events, they could have particularly intensive impact on coastal systems thus causing huge disasters both for people living at the coast and near-shore infrastructure. The increase of damages and economical losses is due to continuously growing population and expanding urban developments in flood-prone coastal areas. In this context, an accurate analysis and evaluation of risk to flooding could serve as a valuable tool to inform public authorities and coastal communities on potential impacts. Establishing flood risks maps to identify adverse consequences for coasts associated with different flood scenarios is an essential part of a thorough hazards management under the Floods Directive 2007/60/EC.
This research presents flood risk evaluation of built environment around the large Bay of Varna, North Bulgarian Black Sea coast due to extreme sea level rise. The study was implemented with the help of 3D GIS modelling for flood risks mapping and analysis. Different types of spatial data were used: i) large scale topographic maps (1:5 000) for identifying low-laying coastal areas at several sea level rise scenarios; and ii) high resolution satellite images for assessing individual and public buildings potentially endangered by extreme sea level rise. The applied GIS approach allows visualisation, interpretation and accurate assessment of coastal territories and urban infrastructure in the studied area being at high risk during the extreme events. The results obtained could be used as primary base for flood hazards management and would be later updated or extended with additional information and more detailed flood survey.