Geophysical Research Abstracts
Vol. 17, EGU2015-13333, 2015
EGU General Assembly 2015

Coupling of a hydrodynamic numerical model, extreme value analysis and climate change for a flooding assessment.

Byron Quan Luna and Luca Garrè
DNV GL, Strategic Research and Innovation, Høvik, Norway (byron.quan.luna@dnvgl.com)

The effects of climate change for future flooding events are one of the most debated issues for risk managers and spatial planners today. It is essential to incorporate the expected impacts of climate change and information of past events in order to assess the flood hazard where long term infrastructure has been planned or has been installed. In this study, an integrated procedure for detailed analysis of river flooding in a localized area was developed and applied. This was achieved by coupling hydrodynamic (using LIDAR data) and statistical (extreme values) modeling, that allowed to obtain flood probabilities for the near and distant future. This was done via a regression line which allowed the inclusion of genuinely recorded flooding measurements together with model-generated flooding occurrences. A better reproduction of the flooding behavior in the tail of the extreme distribution was achieved, and by virtue of this, some shortcomings of extreme value extrapolation encountered in the present application were surpassed. The procedure was applied to measurements of flooding in the Rhine river in The Netherlands and provides useful flooding information for the development of hazard maps and future adaptation measures.