



Global Flood Risk Assessment Using Insurance Loss Data

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All over the world a lot of cities are in flood-prone areas and millions of people are exposed to inundation risk. In this study, we combined AXA Global Flood Risk Maps and historical AXA claims data to provide worldwide flood risk estimates. The main steps to construct this internal Global Flood Risk Assessment tool are as follows. Firstly, a 25m resolution digital elevation model (EU-DEM) for European countries and a 90m resolution digital elevation model (HydroSHEDS-DEM) for the rest of the world are used to extract and analyze hydrological information. Secondly, based on an exhaustive hydrographic database and a 500m resolution rainfall erosivity database, the stream network database was improved. Thirdly, a segmentation by rainfall regionalization was applied. Fourthly, for damage evaluation, for each country the losses of historic floods were evaluated to obtain the average destruction rate by zone of risk. Finally, flood risk maps were obtained by applying the well-known HAND algorithm method for predicting the extent of inundation. Furthermore, we developed a claims-calibrated risk score. The two key issues in the calculation of the flood risk score for each location are (i) the geographical classification combining 4 hydrological zones including runoff and rivers and 5 zones of rainfall intensity, and (ii) the historical AXA claims database. The results show that the Mediterranean region (especially the south of the France and the north of Italy), the west of England (especially the Atlantic coast), and Asia (especially East and Southeast Asia), have the highest risk score.