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Warehouses and whorehouses – on the hazard exposure of commercial property in Austria

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The paper presents a nation-wide spatially explicit object-based assessment of commercial buildings exposed to natural hazards in Austria, including river flooding, torrential flooding, and snow avalanches. The GIS assessment was based on two different datasets, (a) hazard information providing input to the exposure of elements at risk, and (b) information on the building stock combined from different spatial data available on the national level.
Hazard information was compiled from two different sources. For torrential flooding and snow avalanches available local-scale hazard maps were used, and for river flooding the results of the countrywide flood modelling eHORA were available. Information on the building stock contained information on the location and size of each building, as well as on the building category (hotels and guest houses, office buildings, whole sale and retail buildings, buildings used for infrastructure and communication facilities, and industrial buildings and warehouses) and the construction period or year, respectively. Additional information related to the individual floors, such as their height and net area, main purpose and configuration, was included for each property. Moreover, this dataset has an interface to the population register and allowed therefore retrieving the number of primary residents for each building.
It is shown that the repeatedly-stated assumption of increasing exposure due to continued population and related economic growth has to be carefully evaluated by the local development of building stock. While some regions have shown a clearly above-average increase in some assets, such as hotels and guest houses in tourist regions, other regions were characterized by an increase in others, such as whole sale and retail buildings due to urban sprawl. While hotels and hostels are extraordinary prone to torrential flooding, distinct types of commercial buildings are considerably exposed to river flooding.
The temporal assessment of exposure has shown considerable differences in the dynamics of exposure to different hazard categories in comparison to the overall property stock. In conclusion, the presented object-based assessment of commercial property is an important and suitable tool for assessing socio-economic dynamics. The exposure assessment supplements already existing results for residential buildings (Fuchs et al., 2015, 2017) and may therefore be used in operational risk management.

References:
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