



Global storm surge hazard zones: results from a novel high-resolution model

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Tropical cyclones put many areas of the world at risk from strong winds, storm surges and heavy rainfall. Hurricane Katrina in the US or Cyclone Nargis in Myanmar showed that if such storms hit flat coastal areas, storm surges can be the main driver of damage. While the loss potential is huge, there has only been limited availability of risk information and no global overview up to now. We introduce storm surge hazard zones that provide high-resolution, consistent, and worldwide information about the frequency of flooding due to storm surge from the ocean. In areas prone to tropical cyclones and tropical storms, the zones are based on our in-house probabilistic Tropical Cyclone Track Set, consisting of more than 800'000 tracks globally. We used these tracks as input for our in-house global storm surge model which we used to calculate the zones. In areas not affected by tropical cyclones, the zones are based on a different model, where simulated tides were combined with global sea surface height reanalysis data and calibrated using a network of global buoy measurements. The zones show that globally almost 230 million people – roughly 3% of the world's population – are exposed to storm surge risk. Asia is by far the most exposed region. Eight out of 10 metropolitan areas with the most people at risk are in Asia, with areas in China and Japan in the top ranks.