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Editorial: Building flood resilience under climate change

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Editorial on the Research Topic
Building flood resilience under climate change

In many regions of the world, flooding is one of the most dangerous natural hazards and is ranked as the most catastrophic natural disaster in terms of both the total of casualties and the percentage of fatalities (Jonkman, 2005). Storm surges, high tides, heavy precipitations, and quick snowmelt are some of the main factors that can cause flooding. Billions of people who are in danger of flooding worldwide live in low- and middle-income nations (Rentschler et al., 2022). Furthermore, millions of people live in severe poverty and are directly in danger of flooding because of their economic disadvantages. Approximately one-third of global economic losses are attributed to the catastrophic effects of flood occurrences. Flood risk assessment is especially crucial since flood threats are broad, expensive, and disproportionately affect economically vulnerable people (Tascón-González et al., 2020). One of the most critical issues to be solved is how to make our societies more resilient to flooding in the face of climate change. To tackle this critical issue, a paradigm change from reactive crisis management to proactive evaluation and mitigation of flooding risk is necessary (Wenger, 2016).

Documenting the most recent advancements in flood resilience considering climate change is the aim of this Research Topic. We gathered five relevant articles for this Research Topic.

- The paper titled "The Stackelberg Game Model of Cross-Border River Flood Control" by Wang et al. uses cooperative governance among the nations in the Lancang-Mekong River Basin (LMRB) as an example. The paper demonstrates flood control in the upstream region has a larger impact on the downstream region. Flood control in the downstream region progressively grew and flood control in the upstream region gradually diminished with an increase in flood control compensation.
- The paper titled "Resilience to Unusual Flooding After 2021 Tropical Storms in Part of Mainland Southeast Asia" by Wattanachareekul et al. examines several publicly available satellite pictures from the Google Earth engine platform that were captured by Sentinel-1 C band GRD and Sentinel-2. The paper has demonstrated that the typical flow of water was hindered by the existence of man-made buildings, particularly highways. In addition, this study has emphasized and clarified the role of the rural community and the ecosystem's ability to withstand extreme weather occurrences in the future.

- The paper titled "Analytical Advances in Homeowner Flood Risk Quantification Considering Insurance, Building Replacement Value, And Freeboard" by Rahim et al. evaluates the average annual loss (AAL) to determine the flood risk incurred by the homeowner versus the flood insurer for properties in the United States. Using Monte Carlo simulation, the AAL is estimated and partitioned at the individual home scale, considering insurance coverage and deductibles as well as the height of the ground floor above the ground. The study results revealed new perspectives about how flood insurance protects homeowners from flood risk.
- The paper titled "National Assessment of Extreme Sea-Level Driven Inundation Under Rising Sea Levels" by Paulik et al. presents the estimation of the Extreme Sea Level (ESL) heights for nine annual recurrence intervals (ARI) between 2 years and one thousand years and then converted those values into space-varying water surface grids to quantify New Zealand's land area exposure to inundation from ESLs and Rising Sea Levels (RSLs). In the process, a composite topographical dataset consisting of Airborne Light Detection and Ranging (LIDAR) and bias-corrected Shuttle Radar Topography Mission (SRTM) data was developed. Topographical data was modified to represent mitigation structures, and a scalable static model was executed to map land inundation areas for 0.1 m RSL increments.
- The paper titled "Freeboard Life-Cycle Benefit-Cost Analysis of a Rental Singlefamily Residence for Landlord, Tenant, and Insurer" by Gnan et al. presents a life-cycle benefit-cost analysis to maximize the choice of freeboard—an extra first-floor height over the base flood elevation (BFE) for a rental single-family home—for the landlord, tenant, and insurer, or the National Flood Insurance Program (NFIP). The study offers useful data that landlords, tenants, and other decision-makers can use to support their decision-making, which improves investment and occupancy choices.

We hope that the readers will find this Research Topic interesting, and the published papers will stimulate further research to develop appropriate measures for improving flood resilience in the face of climate change.

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