

Coastal Flood Risk Assessment Considering Population Decline Under Climate Change

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Climate change-induced hazards pose significant threat to coastal communities, exemplifying the demand of robust adaptation strategies. Although existing studies have demonstrated the efficiency of adaptation measures in mitigating climate risks, few research have examined the effects related to population decline and elderly population's influence on both exposure and vulnerability of future risk estimation.

Our study demonstrates a comprehensive approach to the evaluation of future economic impact of coastal flooding, incorporating both climatic and socioeconomic uncertainties. Expanding beyond traditional considerations of sea-level rise, our framework includes projections of both asset losses and human casualties which are related to anticipated population changes. By examining future population changes, we can avoid over exemplification of the scale of the exposure and underestimation of vulnerability,

thus obtaining a better understanding of how social impact changes, and how the benefits and rate of return may vary under different social and community changes.

For this year's presentation, we extend our study are to Ise Bay and Tokyo Bay areas, by incorporating HiPIMS and SRH-2D models and compare with real cases, we are having the first glimpse of how population increases and declines have different effects on optimal adaptation strategy selection as shown in the three areas with different population change trends.

We also discuss new approaches for estimating coastal flooding casualties by incorporating building data into evacuation rate calculation which corrected errors caused by underestimating the effect of high-rise buildings.