

# Extreme Precipitation and Riverine Flood Risk Analysis

## Project Description

Understanding and quantifying the flood impacts and damages is of great importance in flood risk evaluation and management, especially for coastal areas that might be affected by both high streamflow and surge. Meanwhile, the changing climate and land use are expected to increase the likelihood and intensity of flood damages, due to the exacerbated effect of rainfall, storm surge and sea level rise.

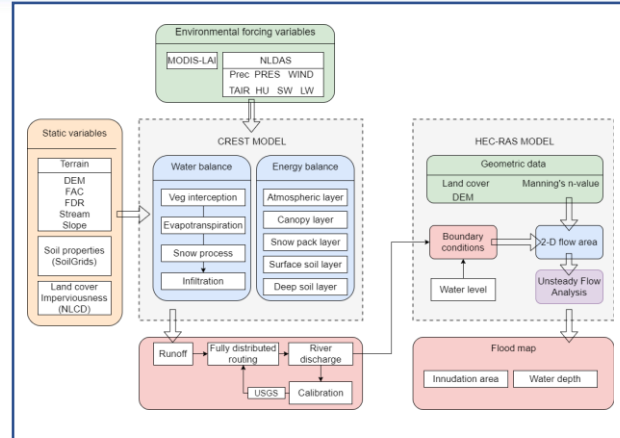


Figure: Methodology of the Project

## Project Findings

- Selected study regions show larger inundation extents when compound flood sources are accounted for than when only one single flood source is considered, suggesting the regions are impacted by compound floods.
- Urbanization would lead to larger streamflow, result in higher inundation depth and larger inundation extent, under the same climate conditions.

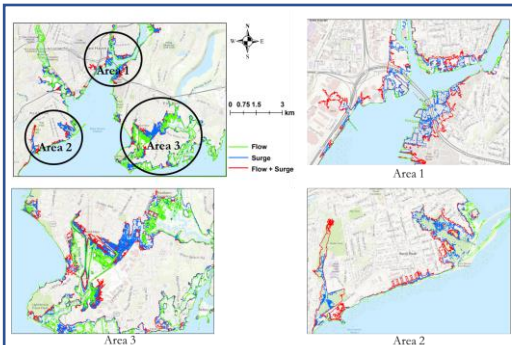


Figure: Flood extent by river flow events, surge events and compound events.

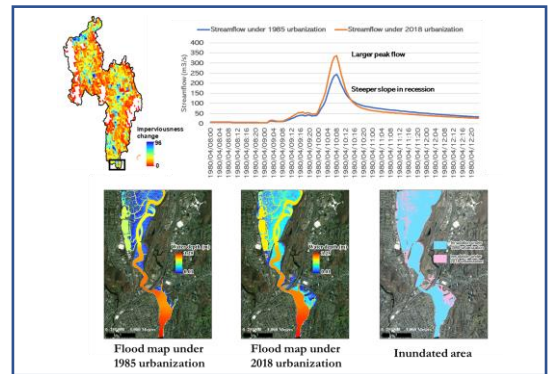


Figure: Hydrographs and flood maps under different urbanization.

## Research Gaps and Recommendations

- Flood management should consider urbanization since it increases the likelihood and intensity of flood events.
- High-resolution hydraulic modelling on marshes are required to provide a detailed inland flooding due to extreme precipitation.
- Parametrizations for hydraulic simulation on compound events should be considered in order to model flood inundation and support flood planning management under different scenarios