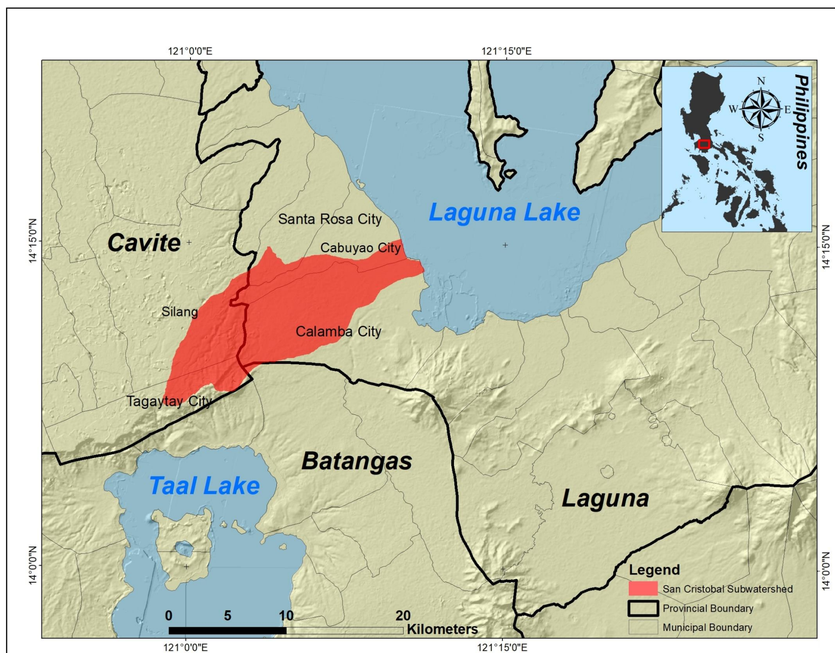
# Land cover change and flood extent in San Cristobal Subwatershed, Philippines

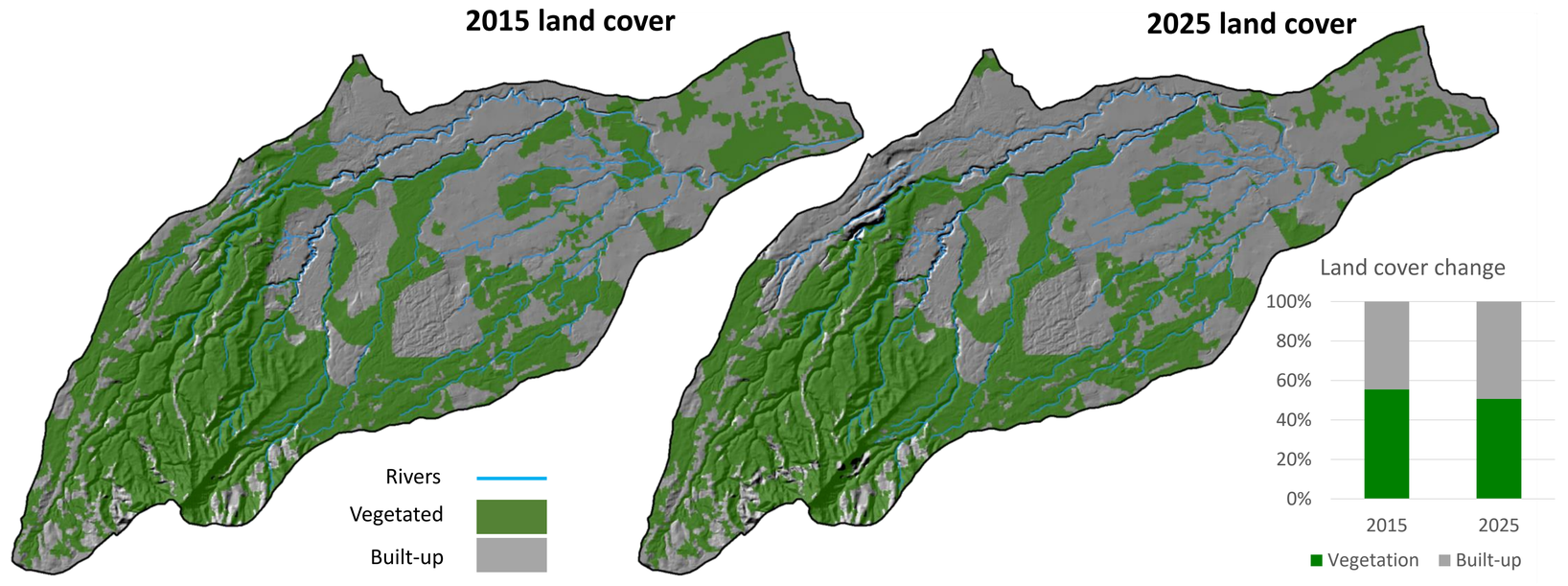
Milben A. Bragais[a], Brian A. Johnson[b], Damasa B. Magcale-Macandog[a], Masayuki Kawai[b] , Pankaj Kumar[b], Rajarshi Dasgupta[b]

[a] University of the Philippines Los Baños, [b] Institute for Global Environmental Strategies, and [c] Tokyo City University

## Overview

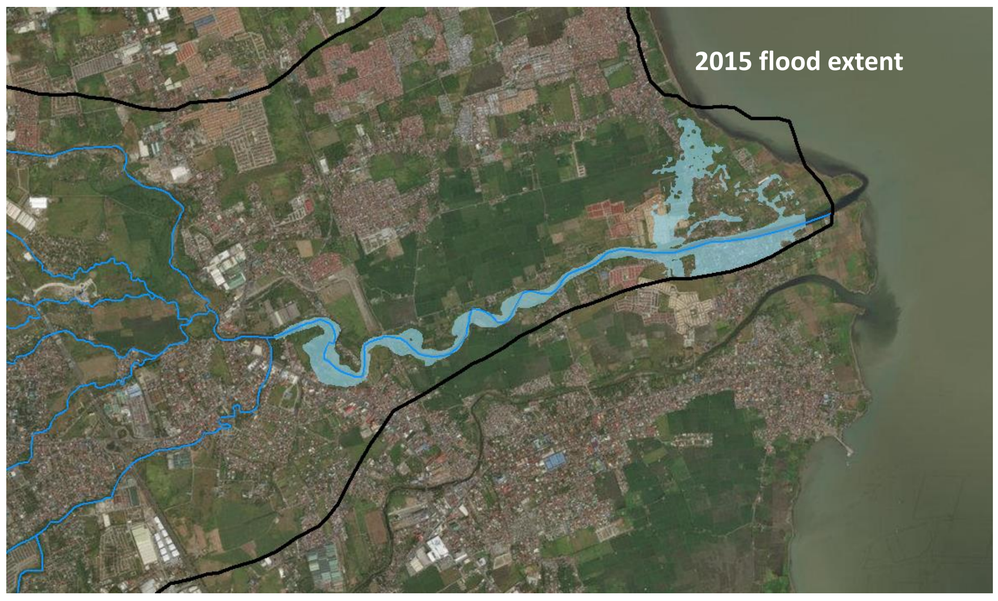
- Year 2015[1] and 2025[2] land cover maps were generated and used as inputs for flood modelling.
- Event-based rainfall[3] with 10-year return period and high resolution digital terrain model[4] were used to generate a detailed flood simulation [5].
- Local government units in the subwatershed can use the results of this study to make their land-use planning climate sensitive.

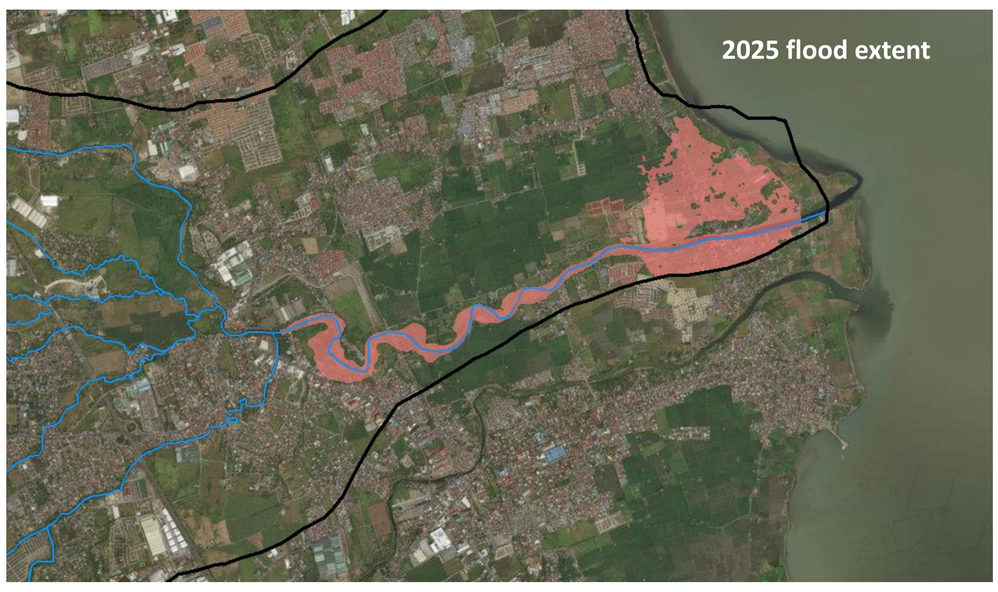


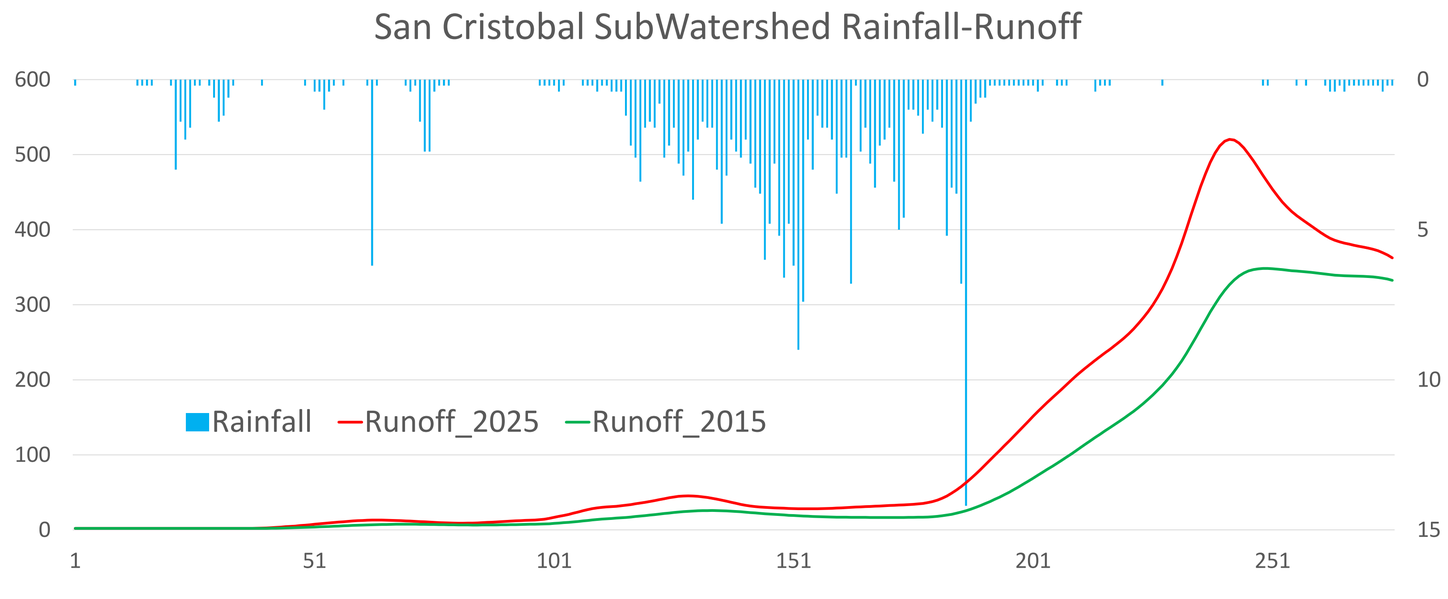



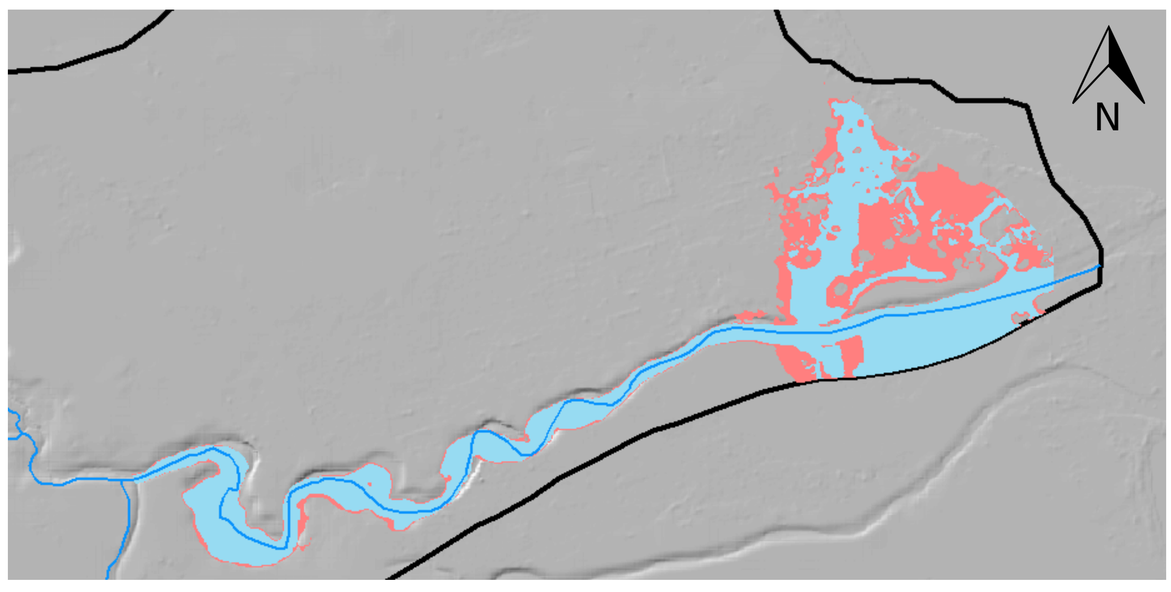

## Key Points

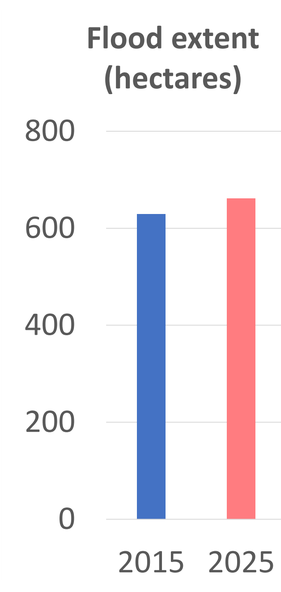
- According to a participatory mapping activity, the built-up area is expected increase by 11% (from 6,158 has to 6,836 has) from year 2015 to 2025.
- Running the model using the same rainfall event, the 2025 land cover will result in a 47% increase in flood extent compared to the 2015 land cover.
- Further calibration and long term simulation should be conducted using down-scaled General Circulation Models (GCMs) to assess the effects of climate change on flooding.




[1] Land cover classification of Landsat 8 and Palsar-2 satellite images, courtesy of the United States Geologic Survey (USGS) and the Japan Aerospace Exploration Agency (JAXA).

[2] Future land cover (2025) of San Cristobal sub-watershed derived from the participatory mapping activity participated by the five local government units (Municipality of Silang, and Cities of Santa Rosa, Cabuyao, Tagaytay, and Calamba).

[3]Selected extreme rainfall event: Typhoon Ofel (Int. Name: Son-Tinh) Oct. 25, 2012; Duration: 12 hours; Amount: 224.4 mm collected using Tipping Bucket Rain Gauge. Classified as 10 year rain return period based on Ambulong Station RIDF (Rainfall Intensity-Duration Frequency Curve) which has a 54 years record, prepared by Hydrometeorological Data Application Section (HMDAS), Hydro-Meteology Division, PAGASA.

[4] IfSAR (Interferometric Synthetic Aperture Radar) derived DTM with 5m x 5m resolution from the National Mapping and Resource Information Authority (NAMRIA).

[5] Flood extent boundaries were generated using the Hydrologic Engineering Center-River Analysis System (HEC-RAS), a freeware designed and coded for the U.S Army Corps of Engineers that allows both one dimensional and two dimensional hydraulic analysis for steady and unsteady flow in rivers.

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