

Overview

The code in this replication package constructs the table and figures in Hsiao (2025), which can be cited as follows. Expected runtime is one minute.

Hsiao, Allan. 2025. "Sea Level Rise and Urban Infrastructure." *AEA Papers and Proceedings*, 115.

Code

The root folder contains `main.jl`, which is the main code file. It is written in Julia. It executes three tasks.

1. It reads the data from `suds.csv`, and it calculates exposure to inundation risk.
2. It tabulates inundation risk for the top 10 cities under sea level rise of 1, 2, and 3 meters. It collects and exports these tabulations to `paper/tab.csv`. This file corresponds to table 1 of the paper.
3. It aggregates and plots inundation risk for groups of cities under sea level rise of 0 to 5 meters in 0.1-meter increments. It exports these plots to `paper/fig*.pdf`. These files correspond to figure 2 of the paper.

Data

The root folder contains `suds.csv`, which is the main data file. Each row records sea level rise exposure for land or infrastructure in a city or part of a city.

1. Columns 1 through 7 are city-level information: population rank (`g`), GHS-UCDB ID (`ghs`), city name (`city`), country name (`country`), land area in square kilometers (`area`), population in 2025 (`pop`), and country GDP quartile in 2020 (`gdp`). If rows have the same value in column 1, then they have the same values in columns 2 through 7.
2. Column 8 breaks out calculations within cities, classifying cells by quartile of night light intensity within each city (`light`).
3. Column 9 records whether calculations are for land or a particular type of infrastructure (`var`).
4. Column 10 is total quantities (`total`). I round to the nearest integer.
5. Columns 11 through 61 are quantities impacted by sea level rise of 0 to 5 meters in 0.1-meter increments (`slr0` to `slr50`). I round to the nearest integer.

These data come from the Sea level rise and Urban infrastructure Data Set (SUDS). The SUDS data and code are publicly available. Total runtime for the code is roughly 4 days for all cities. It produces inundation maps for each city, and I present SUDS maps for Osaka and Bangkok in figure 1 of Hsiao (2025). I include these maps here as `paper/map*.pdf`. The SUDS readme file describes the data, its construction, and the code for replication.

Data: <https://allanhsiao.com/files/suds/data.zip>

Code: <https://allanhsiao.com/files/suds/code.zip>

Readme: <https://allanhsiao.com/files/suds/readme.pdf>