Flood Analysis & Mapping
Town of North Beach
Calvert County, Maryland
Advanced Flood Planning Technical Support

Background

The Towns of Chesapeake and North Beach would like to enhance their capacity to understand, plan and implement projects that mitigate current and future flood impacts. The Towns are both susceptible to tidal flooding, shoreline erosion and stormwater flooding. Each Town is creating an action plan that will identify and characterize both tidal and stormwater flooding, assess the vulnerability of specific geographic areas in their community; recommend mitigation and adaptation options tailored to each specific area to address flooding impacts including sea level rise; and prepare implementation strategies.

It is recognized that because of their shared boundary and similar vulnerabilities that it would be to their benefit to work in collaboration to create flood visualizations that show current day risk and how that will change between 2030, 2050, and 2100. The visualizations will serve as a foundational step in the action planning process.

The 2018 Maryland Sea Level Rise Projections and the 2021 Draft Guidance for Using the 2018 SLR projections will be used to determine which SLR projections to utilize. In spring 2021, a Framework was completed which each Town will use as a basis for their action plan. This scope of work will complete the work proposed in Sections 3.B.i; 3.B.iii and 3.C of the Phase I Framework. The data products should be easily accessible and residents/property owners/Town staff/County staff should all be able to use to easily determine where flood impacts may occur in each Town and how that will change overtime under different conditions.

Purpose

The Eastern Shore Regional GIS Cooperative (ESRGC) will assist the Town of North Beach, in Calvert County, Maryland, with the analysis and processing of data to predict sea-level rise. The ESRGC will provide expertise in defining the study, analysis of the latest sea-level predictions in Maryland (UMCES, 2018), and processing LiDAR derivative products to develop forecasted depth grids, and support mapping needs.

Details

Task 1: Forecast Depth Grid Development

Develop depth grids representing sea-level rise and periodic flooding with a 1% annual-chance of occurrence for the 'forecast' 2030 and 2050 scenarios. *If available, addressed building*

footprints and foundation heights will be used to determine classified (minimal, moderate, substantial, and total) structure damage estimates during the periodic flood event(s). Classification of structure damage is based on the percent of total damage to the structure.

Task 2: Forecast Depth Grid Development with Emission Pathways

Develop a depth grid representing sea-level rise with an emissions pathway for 2100 and a depth grid representing sea-level rise with an emissions pathway and a 1% annual-chance of occurrence for 2100. The greenhouse gas emissions scenario should be chosen from declining, stabilizing, or growing. *If available, addressed building footprints and foundation heights will be used to determine classified (minimal, moderate, substantial, and total) structure damage estimates during the periodic flood event(s). Classification of structure damage is based on the percent of total damage to the structure.*

Task 3: Mapping Results

The ESRGC will develop maps of the forecasted depth grid results. The maps will show the depth grid results, open water, roads, town boundary, and other data layers identified by the Town of North Beach. The maps will identify flood depths of spot elevations, locations provided by the Town of North Beach.

Task 4: Documentation

The ESRGC will create a non-technical review document outlining the analysis included in Tasks 1 and 2. The review will include data source information, assumptions made, limitations, and intended use of products.

For the development of the spatial data layers, the following specifications will be adhered to:

a. A horizontal data scale of 1:1200 will be used.
b. Vector data will be projected in Maryland State Plane, NAD 1983, meters.
c. Raster data will be projected in native 2017 Calvert County LiDAR projection.
d. Raster and vector data layers will include metadata.

Deliverables

The deliverables for this project include the following:

1. Representing 2030, two depth grids (as rasters) from Task 1:
    a. Sea-level rise for 2030
    b. Sea-level rise for 2030 and 1% annual chance periodic flooding
2. Representing 2050, two depth grids (as rasters) from Task 1:
    a. Sea-level rise for 2050
    b. Sea-level rise for 2050 and 1% annual chance periodic flooding
3. Representing 2100, two depth grids (as rasters) from Task 2:
    a. Sea-level rise for 2100 with an emissions pathway
    b. Sea-level rise for 2100 with an emissions pathway and 1% annual chance periodic flooding
4. Maps of depth grids from Task 3 (30 total maps):
    a. 2030 SLR (11x14)
    b. 2030 SLR (24x36)
    c. 2030 SLR Area A

d. 2030 SLR Area B
e. 2030 SLR Area C
f. 2030 + 1% (11x14)
g. 2030 + 1% (24x36)
h. 2030 + 1% Area A
i. 2030 + 1% Area B
j. 2030 + 1% Area C
k. 2050 SLR (11x14)
l. 2050 SLR (24x36)
m. 2050 SLR Area A
n. 2050 SLR Area B
o. 2050 SLR Area C
p. 2050 + 1% (11x14)
q. 2050 + 1% (24x36)
r. 2050 + 1% Area A
s. 2050 + 1% Area B
t. 2050 + 1% Area C
u. 2100 SLR C02 EMISSIONS PATHWAY (11x14)
v. 2100 SLR C02 EMISSIONS PATHWAY (24x36)
w. 2100 SLR C02 EMISSIONS PATHWAY Area A
x. 2100 SLR C02 EMISSIONS PATHWAY Area B
y. 2100 SLR C02 EMISSIONS PATHWAY Area C
z. 2100 + 1% C02 EMISSIONS PATHWAY (11x14)
aa. 2100 + 1% C02 EMISSIONS PATHWAY (24x36)
bb. 2100 + 1% C02 EMISSIONS PATHWAY Area A
cc. 2100 + 1% C02 EMISSIONS PATHWAY Area B
dd. 2100 + 1% C02 EMISSIONS PATHWAY Area C

5. Non-technical documentation outlining the analysis included in Tasks 1 and 2.

Tentative Project Schedule*

February 1, 2022	Project begins
March 9, 2022	Draft data and maps delivered for review
March 25, 2022	Project complete, all deliverables received by Town

*Project begin date is dependent on date of Town approval

Cost

The total cost of the project is **$5,817.01** (includes a 15.5% indirect cost recovery fee for Salisbury University).