

FIRST FLOOR ELEVATIONS PROJECT UPDATE

HRPDC Coastal Resiliency Committee

June 26, 2020

PROJECT BACKGROUND

MOTIVATION

First floor elevations (FFE) are important for estimating damages from flood events, but available data is limited.

GOALS

Develop an FFE inventory using multiple estimation methods to inform flooding vulnerability assessments

FUNDING

3-year effort with grant funding from the Virginia Coastal Zone Management Program



Virginia Coastal Zone
MANAGEMENT PROGRAM

PROJECT TIMELINE



PHASE 1

Developed elevation
certificate inventory and
FFH predictive model

Concluded February 2019



PHASE 2

Applied FFH estimates in a
flooding vulnerability analysis
in pilot communities

Concluded February 2020



PHASE 3

Expand Phase 1 and 2
methodologies/analysis
to the regional scale

Currently underway

PHASE 1

METHODS AND FINDINGS

METHODS

- Elevation certificate data entered into GIS and is available at HRGEO.org
- Developed a Random Forest model that use building attributes to estimate FFH in Chesapeake and Hampton

FINDINGS

- Foundation type is important for predicting FFH.
- Random Forest model has reasonable accuracy, but requires a relatively large FFH sample.





PHASE 2

METHODS

DATA DEVELOPMENT

- Developed model in York County
- Compared accuracy of Google Street View stair counting and measuring to default values

VULNERABILITY ASSESSMENT

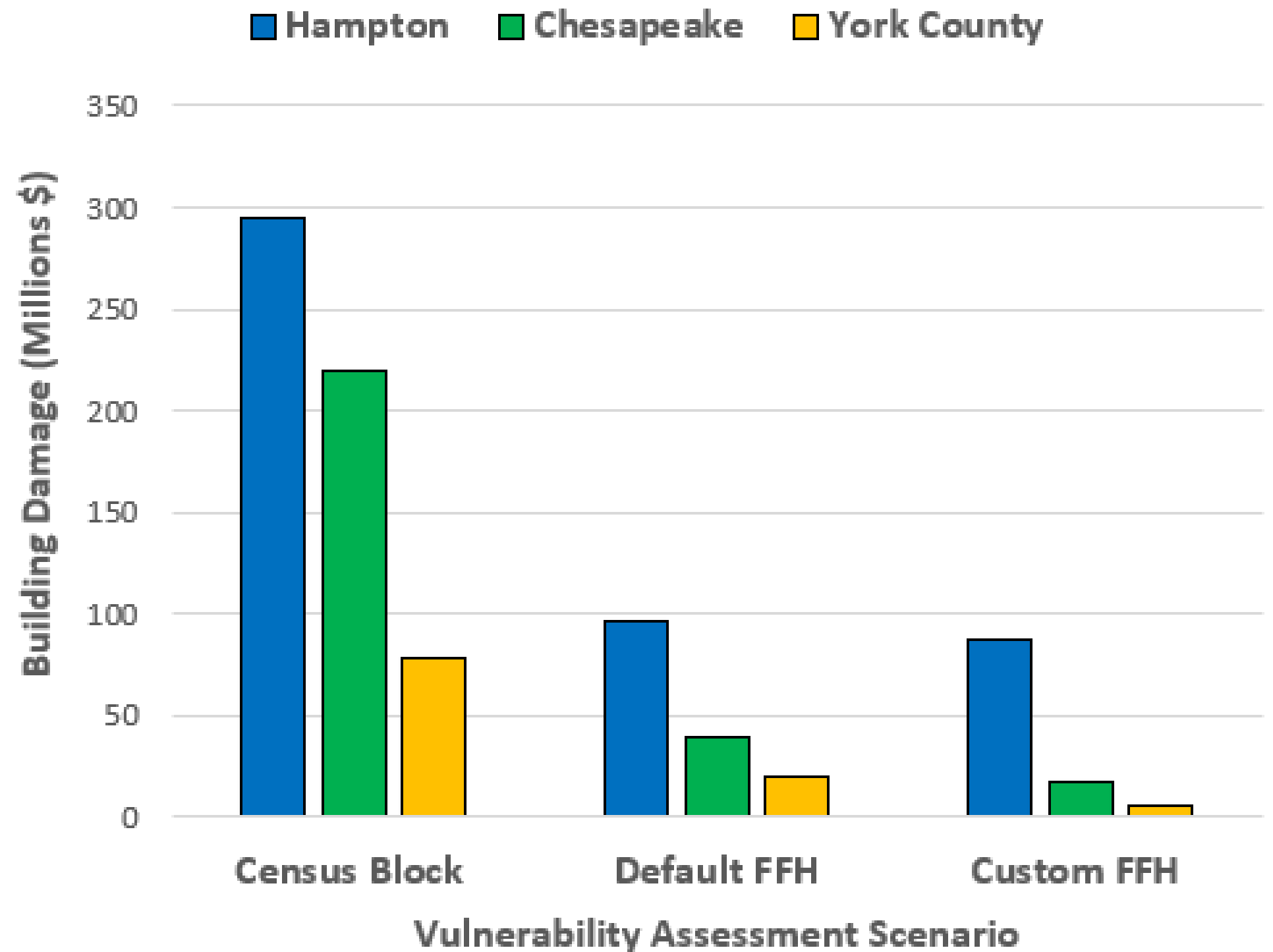
Estimated damages for the 100-year flood:

- FEMA Hazus Census Block analysis
- FEMA FAST tool with default FFH
- FEMA FAST tool with custom FFH
- Probability-based approach (Hampton only)

PHASE 2

KEY FINDINGS

- Individual structure-level analysis is recommended over Census Block analysis.
- Adjusting FFH by <1ft can change flood damage estimates by hundreds of structures and millions of dollars.
- Developing a regional FFH inventory will require multiple methods:
 - Predictive model
 - Google Street View
 - Hazus default values

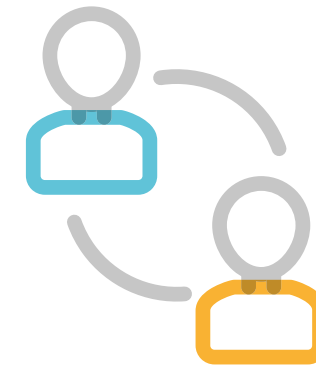


PHASE 3



DATA PRODUCTS

Regional FFH layer for residential structures in the Special Flood Hazard Area



COORDINATION

Develop recommended practices for creating and applying FFH data



TIMELINE

Final report and data anticipated late fall 2020



ANALYSIS

Apply FFH estimates in a regional vulnerability analysis:

- 100-year flood
- Additional sea level rise