

EXHIBIT F

DEP AGREEMENT NO. R1821

City of Atlantic Beach Vulnerability Assessment

City of Atlantic Beach

Final Project Report



This report funded in part, through a grant agreement from the Florida Department of Environmental Protection. The views, statements, findings, conclusions and recommendations expressed herein are those of the author(s) and do not necessarily reflect the views of the State of Florida or any of its subagencies.

July 2019

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Executive Summary

Sea levels have risen measurably over the years in Atlantic Beach. The question is how will this rate of sea level rise change in the future and how will it affect us as a City? To help answer these questions, the City embarked on a study to evaluate the vulnerability of the City with respect to nuisance flooding and storm induced flooding from sea level rise in the 25-, 50- and 100-year timeframe. This report details the methodology utilized to develop a statistically based approach to vulnerability from sea level rise and assessed the vulnerability of critical facilities and infrastructure. The assessment also included an evaluation of the potential impact to all properties and structures within the city limits. The results of this effort are series of maps that are essentially future versions of the FEMA Flood Insurance Rate Maps utilized for planning and building requirements today. The analysis reveals that there may be significant future impacts from sea level rise in the not so distant future that will have to be taken into account with respect to planning, development and redevelopment. This report forms the basis for the next step in planning for the impacts of sea level rise through development of an adaptation plan. The adaptation plan will consider policies, planning measures, future projects, etc. to help adapt to and mitigate for impacts to vulnerable areas of the City.

Methodology

For this vulnerability assessment, the baseline is the existing mean higher high water (MHHW) level and the current FEMA FIRMs for the City. The MHHW level, which is the average of the higher of each of the two daily high tides, provides an indication of the frequency of sunny day flooding occurrences due to normal tidal cycles and does not include storm events.

The FIRMs for the City of Atlantic Beach provide a prediction of what the 100-year flood event water levels will be. While FEMA does not consider sea level rise (SLR) in the development of a FIRM, they do conduct a rigorous analysis of storm surge flooding and flooding due to upland inundation from rainfall. FIRMs are currently used to map properties with respect to the 100-year flood event to set flood insurance premiums as well as to determine where stricter building and development standards apply for flood protection.

Given the common use of FIRMs for regulatory purposes and general familiarity many people have with these maps, this vulnerability assessment utilizes the FEMA methodology to predict the extents of a 100-year flood event in the future considering the effects of SLR. The technical analyses that serve as the foundation for this vulnerability assessment resulted in essentially producing maps of what the FIRM may look like in 25, 50 and 100 years considering sea level rise. The analyses also incorporated the loss of soil storage that may result from rising sea levels as well as predicted future build-out conditions within the city boundaries.

Outcome

Future flood maps were developed using the same process FEMA utilized to create current Flood Insurance Rate Maps that depict the current extent of flooding expected from a 100-Year storm event. The extent of flooding from a 100-year storm event associated with projected sea levels in 2119 are provided for illustrative purposes only. The 2044 and 2069 scenarios are used for the Vulnerability Assessment due to the high level of uncertainty in sea level rise projections beyond 50 years.

Based on the projected impacts of sea level rise, there will likely be additional properties in the future that will be subject to both nuisance flooding and located within a Special Flood Hazard Area (SFHA, which is the area inundated by flood waters from a 100-year storm event).

Nuisance flooding totals are important because they reflect what is likely to happen at least annually year. By 2069, nuisance flooding is predicted to impact 13% of properties in Atlantic Beach totaling \$232,210,034 in taxable value. In 2069, 38% of properties will fall within the projected 100 year flood risk map totaling \$603,815,032 in taxable value.

Existing development standards in place will help mitigate the impacts from sea level rise on property up to a certain point. These standards relate to the required minimum finished floor elevation (FFE) for all new construction that creates a buffer between flood water and living areas. The City currently requires a minimum finished floor elevation of 7.5 feet above mean sea level or 2.5 feet above the 100- year flood elevation or base flood elevation (BFE) per Chapter 24, Sec. 24-251(c) of the Land Development Code. However, the buffer provided by FFE standards that apply today to properties located in a SFHA will be reduced in the future as sea levels rise. Note that many structures currently located in a SFHA were built before these standards were required and will experience higher risk unless they are elevated.

The impact of SLR with respect to the vulnerability of critical facilities and infrastructure within the City is important with respect to planning. Critical facilities and infrastructure within the city limits located within areas subject to future inundation were picked up in the assessment. Facilities and infrastructure located outside of the city limits are noted and will be assessed in a separately to this report. The assessment showed no direct impacts from the projected sea level in 2044 and direct impact to one wastewater lift station from the 2069 projection. However, one additional lift station, the City Commission Chambers, and sections of five of the nine critical roadways are located within just twenty feet of the projected 2069 sea level.

An assessment of critical facilities and infrastructure within the city was also completed for projected nuisance flooding in years 25 and 50. The results show one lift station projected to be impacted by nuisance flooding in 2044 and four lift stations projected to be impacted in 2069. Further, the models show the City Commission Chambers, the City Hall parking lot, and various sections of critical roadways may be prone to nuisance flooding by 2069.

Using the projected 100-year flood zones in 2044 and 2069, an assessment of critical facilities and infrastructure within the city limits was completed. In both scenarios, critical facilities including the Police and Fire Station, City Hall, the Gail Baker Community Center, and Atlantic Beach Elementary School are located within the projected flood zones. In addition, the only water plant located within city limits, four gas stations, and sections of all nine identified critical roadways are within both flood zone scenarios. Lastly, one potable water well is within the projected 2044 flood zone and two potable water wells are located within the projected 2069 flood zone.

[A webpage with all supporting materials and final document can be found here.](#)

Further Recommendations

The final vulnerability assessment was presented to the Environmental Stewardship Committee on June 12th for feedback and consideration. The Committee recommended staff use the findings in the assessment to begin an adaptation planning process using the structure provided from the Department of Economic Development. Staff intends to build an adaptation planning committee to address the findings and propose long term solutions.

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