

MINUTES
TECHNICAL ADVISORY COMMITTEE
TO THE WATER ADVISORY BOARD
December 20, 2019

MEMBERS PRESENT

Albert Carbon (Chair), Kevin Hart (Co-Chair), Harold Aiken, Doug Bell, Randy Brown, Mark Collins, Sara Forelle, Rafael Frias, Susan Bodmann for Alan Garcia, Barry Heimlich, Steve Holmes, Diego Munoz, Jennifer Jurado, Pete Kwiatkowski, Jose Lopez, Lisa Milenkovic, Marta Reczko for Renuka Mohammed, Stephanie Pearson, Steve Urich, Sean Dineen

OTHERS PRESENT

Carlos Adoriso, J. Martin Cala, Matt Davis, Mark Ellard, Norma Ellison, Vivek Galav, Susan Juncosa, John Loper, Carolina Maran, Lorraine Mayers, Robert McColgan, Johana Narvaez, Rajendra Ramgulam, Guillermo Regalado, Corry Taylor, Alyssa Jones Wood

(A sign-in sheet reflecting those present is filed with the supplemental papers of the meeting, as well as copies of the presentations.)

CALL TO ORDER

A meeting of the Technical Advisory Committee to the Water Advisory Board was held on December 20, 2019; commencing at 9:35 am in the Hearing Room of the Broward County Government Center West in Plantation, FL. A quorum was present.

APPROVAL OF MINUTES

The minutes of the October 18, 2019 meeting were motioned and approved.

PRESENTATIONS

The Chair announced that the order of presentations are changed, as follows:

1. Hallandale Green Infrastructure Initiatives
2. FEMA Coastal Flood Risk Study
3. Future Conditions 100-Year Flood Map – Future Simulations
4. Future Conditions 100-Year Flood Map – Rainfall Projections

Hallandale Green Infrastructure Initiatives

Alyssa Jones Wood, Green Initiatives Coordinator, City of Hallandale

Referring to her hand-out, Alyssa Jones Wood provided background information and statistics on the City of Hallandale's size, residential and seasonal population, and percentage of buildings within FEMA Special Flood Hazard Area. She provided an update on the City's comprehensive plan amendments relating to new Peril of Flood and Low Impact Development (LID) policies promoting the use of native landscaping methods and incorporating LID into all new public projects within FEMA flood zones.

Ms. Wood outlined the components of both short-term and long-term goals of the City's Sustainability Action Plan involving resiliency, conservation, efficiency, outreach, recycling, funding, evaluation, land use, and transportation. Referring to her hand-out, she described the Sustainability Action Plan's Green Infrastructure Projects, particularly illustrating the benefits of the City's Pilot Bioswale Project. Ms. Wood emphasized the importance of how bioswales function as part of the stormwater management system. She outlined the various components of the City's Low Impact Development Maintenance Plan, and some of the obstacles encountered.

Ms. Woods then explained the City's new Ocean Friendly Landscape Rebate Program which was launched October 2019. The program provides a \$1 per square foot rebate to residents/business owners to convert sections of their lawn to rain gardens, bioswales, or other green infrastructure applications. This program is linked with the Coral Reef Protection Ordinance. She outlined the rebate process, its guideline details, projects in process, and the City's present inventory of green infrastructure.

The Chair thanked Ms. Woods for her presentation. A question and answer period followed.

FEMA Coastal Flood Risk Study

Carlos Adoriso, Engineering Supervisor, Environmental Engineering & Permitting, Broward County

Carlos Adoriso provided some background information on the FEMA FIRM (Flood Insurance Rate Map) maps. FEMA Region IV coastal risk studies include Palm Beach, Broward, Miami-Dade, and Monroe counties. Broward County's scope involves 25 miles of shoreline and 27 out of 31 communities. The last update was in August 18, 2014 using information from the 1980's coastal flooding analysis (storm surge and wave action). Because the current study is based on outdated hurricane modeling and topographic data, the coastal flood risk study is being updated.

Mr. Adoriso outlined the basic elements of a coastal flood risk study. Base Flood Elevations (BFE's) of a FIRM include 4 components:

- Storm surge Stillwater elevation (SWEL)
- Amount of wave setup
- Wave height above storm surge (SWEL) elevation
- Wave runup above storm surge elevation (where present)

He then explained in detail the modeling highlights. Referring to various graphs in his hand-out, he compared the current study to the newest data used in the new study using LIDAR and Bathymetric Data. After reviewing many historical storms, 5 storms were selected to validate the hurricane/surge model:

- Hurricane Betsy (1965)
- Hurricane David (1979)
- Hurricane Andrew (1992)
- Hurricane George (1998)
- Hurricane Wilma (2005)

Mr. Adoriso referred to maps and photos in his hand-out depicting storm surge results and various statistics and calculations on overland wave analysis. The final coastal flood risk study will produce a flood risk report, a flood risk map, and a flood risk database. The benefits included in these changes to the last FIRM will help communities understand changes to flood maps, identify areas of flooding

increases and decreases and zone changes, and also identify structures and parcels that are at risk. He referred to his maps illustrating those changes.

Mr. Adoriso then outlined the status on the completed phase of the study:

- Phase I – Data collection and set up/run of hurricane model
- Phase II – Calculation of 1-percent-annual-chance flood elevations
- Phase III – Run Wave Model and calculation of special flood zone areas - Zones AE and VE
- Phase IV – Map results

In summary, Mr. Adoriso provided the upcoming schedule and the next steps:

- Preliminary FIRMS and FIS Reports were delivered on 12/31/19
- CCO meetings and flood risk open houses will be held in February 2020
- 90-day appeal periods will start in 2020
- Letters of final determination will be issued in 2020/2021 timeframe
- FIRMS and FIS Reports will be distributed in 2021
- Resilience meetings will be held in 2021
- FIRMS and FIS Reports will be effective in 2021

The Chair thanked Mr. Adoriso for his presentation. A question and answer session ensued.

approval process. The upcoming stakeholder involvement steps were shared. Three stakeholder workshops are scheduled for late January. Final stakeholder comments will be included and shared in the updated flood map for presentation at this committee's February meeting. Two informal workshops are scheduled for March.

The Co-chair thanked Mr. Loper for his update. A question and answer session continued.

Future Conditions 100-Year Flood Map – Rainfall Projections

Mark Ellard, P.E., CFM, Senior Principal, Water Resources, Geosyntec Consultants
Carolina Maran, Ph.D., P.E., Water Resources Manager, Broward County EPCRD

Mark Ellard acknowledged the members of the project team:

- Broward County – Jennifer Jurado, Carolina Maran, Mike Zygnerski
- GeoSyntec – Prime consultant in charge of data collection, stakeholder outreach, rainfall Analysis, model tool development, evaluation and recommendations
- Taylor Engineering – Hydrologic & Hydraulic Modeling – updating current conditions, developing Future conditions, integrating coastal analysis
- CLIMsystems and Jupiter Intelligence: Future Rainfall Development
- Stoner & Associates: Surveying
- Adept Strategy and Public Relations

Mr. Ellard outlined the project goals involved in mapping future flood risk and enhancing infrastructure resilience. He outlined the major tasks of data collection and review, stakeholder outreach and coordination, updating the current conditions model, development of the future conditions model, development of the future 100-year flood contour map, and CRS evaluation and recommendations.

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coordination, updating the current conditions model, development of the future conditions model, development of the future 100-year flood contour map, and CRS evaluation and recommendations.

He referred to a chart depicting the unified sea level rise projections and a map depicting future groundwater conditions for Broward County. He remarked that there are large associated uncertainties pertaining to future rainfall analysis. There are large biases calculated between climate model data and observations. All results and associated uncertainty ranges show increasing rainfall. There is a 13% increase in 100-year rainfall projection by 2060-2070. The consensus on a strategy for moving forward is to adopt one factor for the entire urban area, a super-ensemble approach.

Mr. Ellard announced that a workshop is scheduled for September 17th with representatives from Broward County, SFWMD, FIU, USGS, the consultant team, and other interested parties.

In summary, Mr. Ellard outlined the super-ensemble results for design storms. A technical question and answer session continued. The Chair thanked Mr. Ellard for his update.

Future Conditions 100-Year Flood Map – Future Simulations

Mark Ellard, P.E., CFM, Senior Principal, Water Resources, Geosyntec Consultants

John Loper, P.E., Associate Vice President, Taylor Engineering

Referring to a map in his hand-out, John Loper depicted the model input changes of the 4 categories of the County's permitted areas:

- Category 1: Areas controlled by operable structures
- Category 2: Areas with at least 10% waterbody land coverage
- Category 3a: Areas with < 10% waterbody land coverage and at least 6" groundwater storage
- Category 3b: Areas with < 10% waterbody land coverage and < 6" groundwater storage

Mr. Loper also outlined the various model setup changes regarding; i.e., correcting "pump on" elevations, implementing pump logs, etc. Other graphs in his hand-out depicted various rainfall discharge statistics of the G-54, S9, S37A, and S38A structures. He discussed the design storm runs that were completed for 10, 25, 50, 100 and 500-year, 3-day rainfall events. Regarding future conditions modeling; future land use, future groundwater, future rainfall were all factored in. For future rainfall, current conditions for 3-day depths were increased by 1.09 for 10 yrs, 1.12 for both 25 and 50-yrs, 1.13 for 100 yrs, and 1.18 for 500 yrs. Unified sea level rise projections illustrated that tidal boundaries would increase by 26" by Year 2060. Various charts illustrated the future conditions results for both current and future 100-yr results of the main gates in the main tidal outfall structures. Tidal boundaries along the coast are predicted to exceed the "gate closed" overtopping elevations, even with no storm surge. Combinations of rainfall-induced flooding and coastal surge will be evaluated as part of SFWMD FPLOS Program.

The Chair left the meeting at 11:35 am.

In summary, the current progress from 2018 and next steps thru 2020 were outlined; from data collection and review, up to final stakeholder workshops, and thru final future conditions flood map approval process. The upcoming stakeholder involvement steps were shared. Three stakeholder workshops are scheduled for late January. Final stakeholder comments will be included and shared in the updated flood map for presentation at this committee's February meeting. Two informal workshops are scheduled for March.

The Co-chair thanked Mr. Loper for his update. A question and answer session continued.

NEXT SCHEDULED JOINT WAB/TAC MEETING: January 24, 2020
NEXT SCHEDULED TAC MEETING: February 21, 2020

ADJOURNMENT

There being no further business to discuss, the meeting adjourned at 11:50 am.