

Broward County Future Conditions 100-Year Flood Map

Environmental Protection
Growth Management Department
June 2021



Flood Risk and Climate Change Challenges

- ▶ Sea level rise
- ▶ Groundwater table rise
- ▶ Extreme rainfall
- ▶ Increased storm intensity
- ▶ Extreme tides
- ▶ Storm surge
- ▶ Compounded flooding

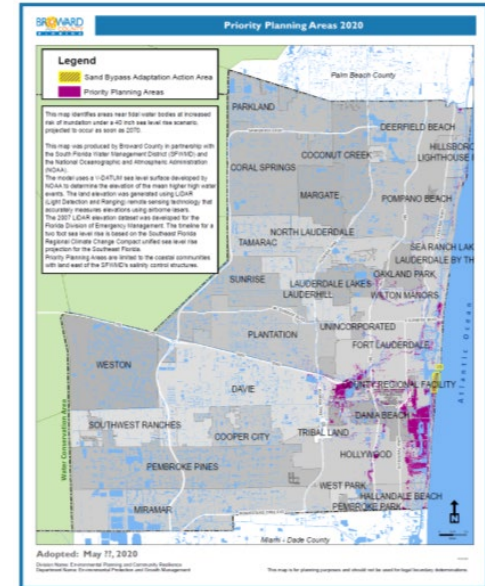
Coastal Flooding



Inland Flooding

Broward's Resilience Planning Approach

- ▶ Adopted Sea Level Rise Projection
- ▶ Priority Planning Area Map
- ▶ Future Conditions Map Series
- ▶ Resilience Standards
 - Drainage infrastructure
 - Tidal flood barriers
 - 100-Yr Flood elevations
 - Design storms



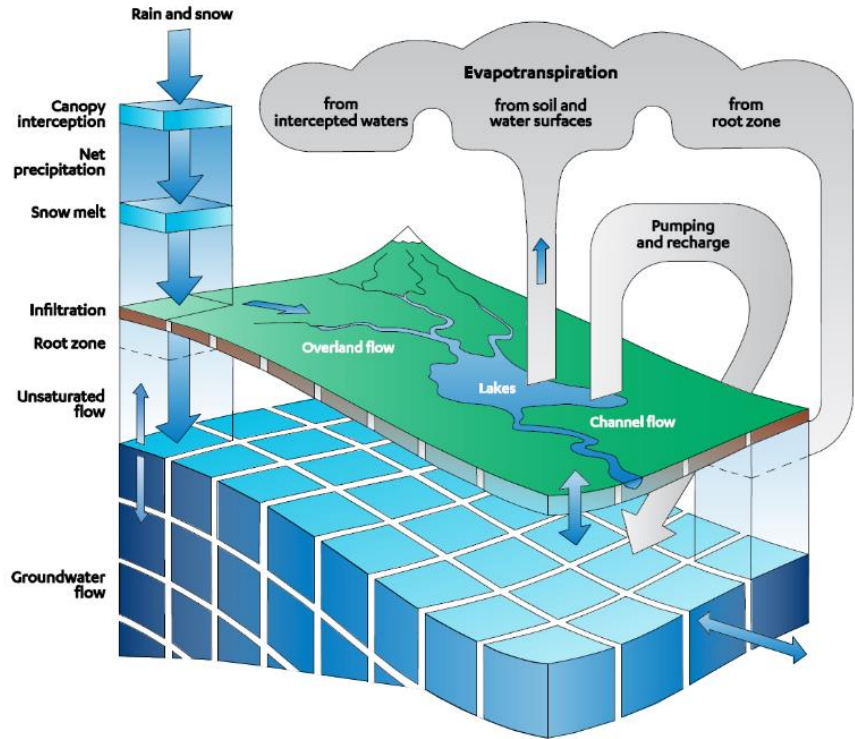
Integrated Modeling: Future Conditions 100-Year Flood Elevations

► Factors:

- 50-year planning horizon
- 2 feet sea level rise
- Increased rainfall
- Increased runoff
- Land use changes

► Will enhance infrastructure resilience:

- Planning and regulatory applications
- Vulnerability assessments
- Finished floor elevations
- Infrastructure siting



Source: DHI, Inc.

Broward's Finish Floor Requirements

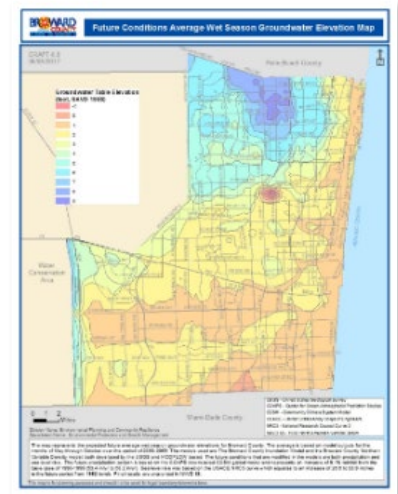
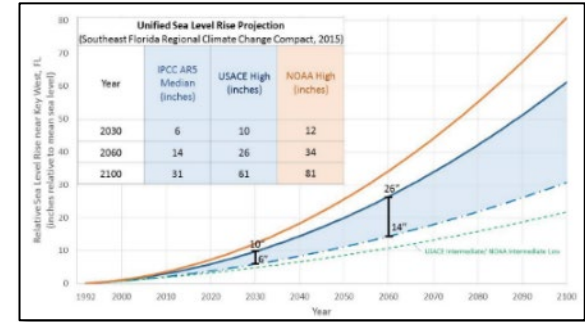
Highest of the following:

- ▶ Current 100-yr flood map developed in 1977
- ▶ FEMA maps – existing conditions
- ▶ Site specific 100-year calculation
- ▶ 18 inches above crown of road



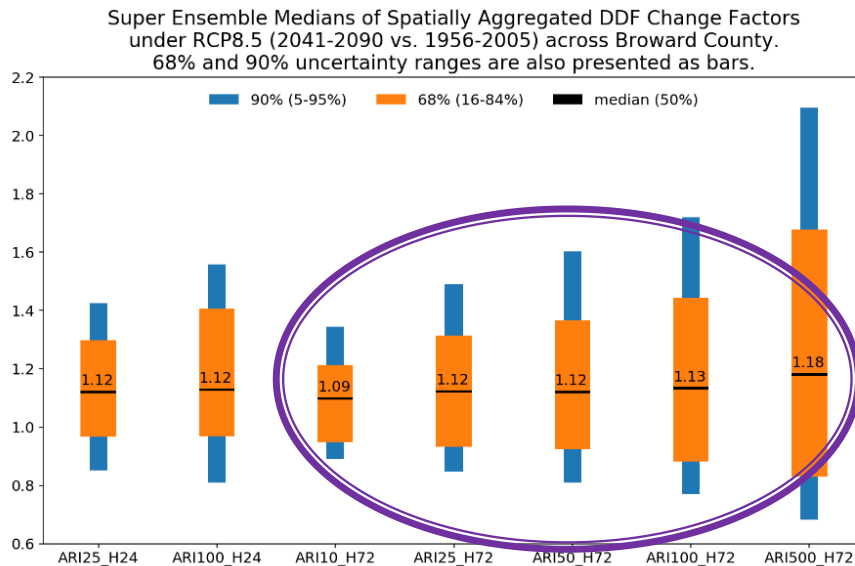
Future Conditions Model Updates

- ▶ 2ft Sea Level Rise (2015 Projection)
- ▶ Future Groundwater Conditions (Broward County GW Elev. Map)
- ▶ Future Rainfall DDF/IDF
- ▶ Future Land Use
- ▶ Future Major Infrastructure Projects
- ▶ Future Control Structure Operations



Future Rainfall Analysis Datasets

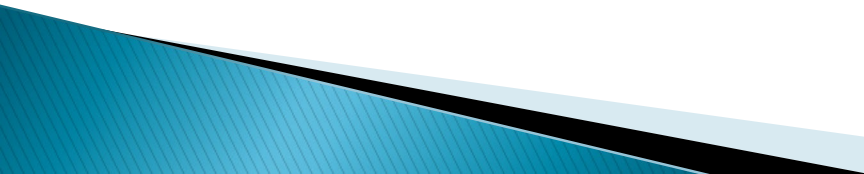
- ▶ Target Future Year 2060
- ▶ Leverage Atlas 14 Rainfall Stations
- ▶ Evaluated commonly available downscaled climate datasets
- ▶ Technical Work Group
 - Broward County, SFWMD, FIU, USGS, Consultant Team, Other interested parties
 - Super-Ensemble approach
- ▶ **ADOPT ONE FACTOR (%) FOR THE ENTIRE URBAN AREA**



Team Climate Science Partners

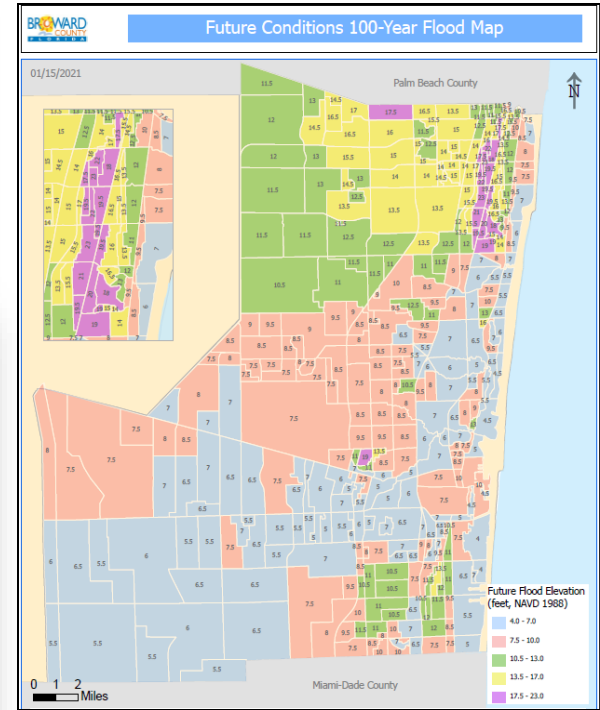
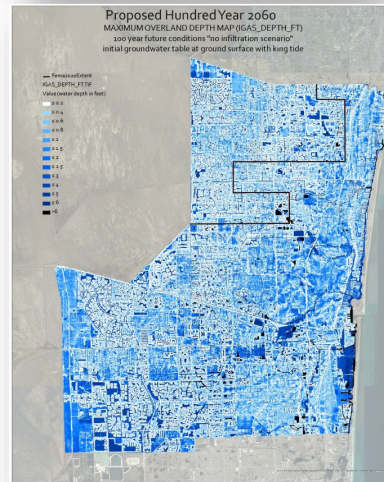
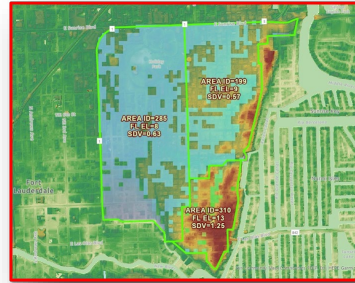


Modeled Hydrologic Conditions

- ▶ Seasonal high “King” tide conditions (October)
 - ▶ Wet season antecedent conditions (system saturation)
 - ▶ High Groundwater / Limited Soil Storage
 - ▶ 13% Increase in 100-year 3-day rainfall event
 - ▶ Map peak elevations and 0.5' flood depth threshold
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100-year Future Conditions Flood Map

- ▶ Accounts for:
 - 2 Feet SLR
 - King tides
 - Increase rainfall (13%)
 - Ground saturation
- ▶ 368 discrete flood areas
- ▶ Informed by basins, topographic features, drainage
- ▶ Similar to Eta conditions



Financial Benefits vs. Liabilities

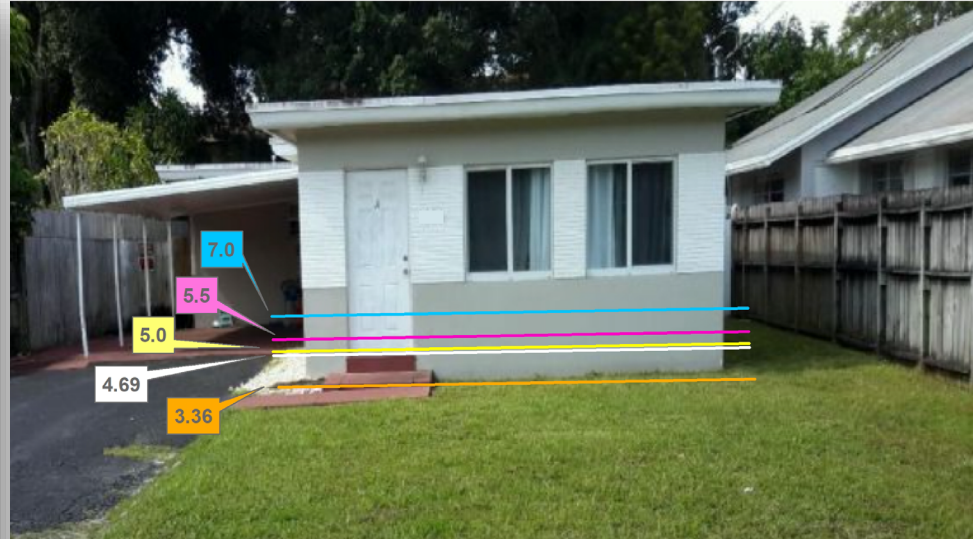


Credit: L. Vialpando

Commercial and Residential Relevance



- Future Conditions 100-Year Flood Map: 7.0 Feet —
- Minimum Floor Elevation per SFWMD ERP: 6.5 Ft —
- FEMA 2014 Flood Elevation: 6.0 Feet —
- Existing 100-Year Flood Map: 5.5 Feet —



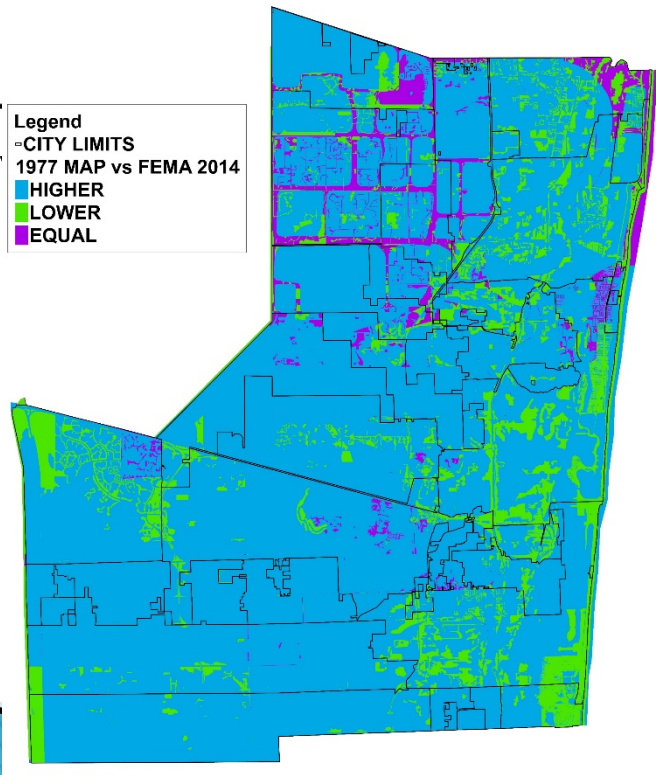
- Future Conditions 100-Year Flood Map: 7.0 Ft —
- Existing 100-Year flood map: 5.5 Ft —
- FEMA 2014 Flood Elevation: 5.0 Ft —
- Finished Floor Elevation: 4.69 Ft —
- Lowest Adjacent Grade next to Building: 3.36 Ft —

Flood Elevation Change Comparison

1977 COMMUNITY MAP COMPARED TO
ADOPTED FEMA 2014 FLOOD ELEVATIONS

Legend
-CITY LIMITS
1977 MAP
HIGHER
LOWER
EQUAL

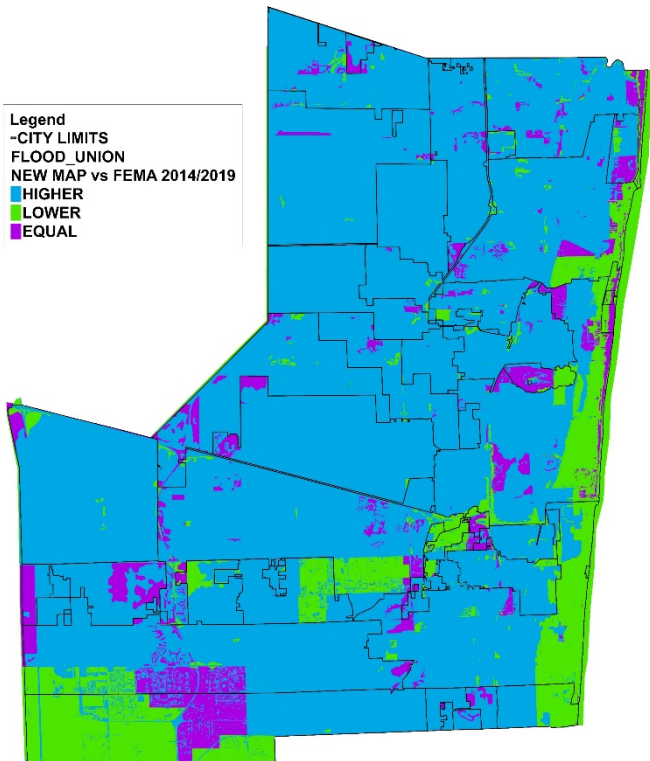
Legend
-CITY LIMITS
1977 MAP vs FEMA 2014
HIGHER
LOWER
EQUAL



PROPOSED FUTURE FLOOD MAP COMPARED TO HIGHER OF
ADOPTED FEMA 2014 / PROPOSED FEMA 2019 FLOOD ELEVATIONS

Legend
-CITY LIMITS
FLOOD_UNION
NEW MAP vs F
HIGHER
LOWER
EQUAL

Legend
-CITY LIMITS
FLOOD_UNION
NEW MAP vs FEMA 2014/2019
HIGHER
LOWER
EQUAL



Engagement Process

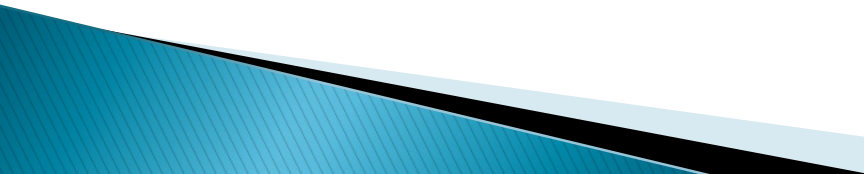
- ▶ Stakeholder input
- ▶ Technical workgroup
- ▶ Vetting and refinement of model
- ▶ Regular TAC updates
- ▶ Stakeholder meetings
 - Municipal workshop
 - Industry workshop
 - Association input
 - Individual feedback



FIU



Next Steps

- ▶ WAB and TAC Approval (Dec/Jan)
 - ▶ Present to League of Cities (Feb)
 - ▶ Present to Local Planning Agency (April)
 - ▶ Present to Planning Council (April)
 - ▶ Present to County Commission (June)
 - ▶ Proposed effective date of June 30, 2021
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Questions?

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