

# Proposed Floodplain Regulation Updates



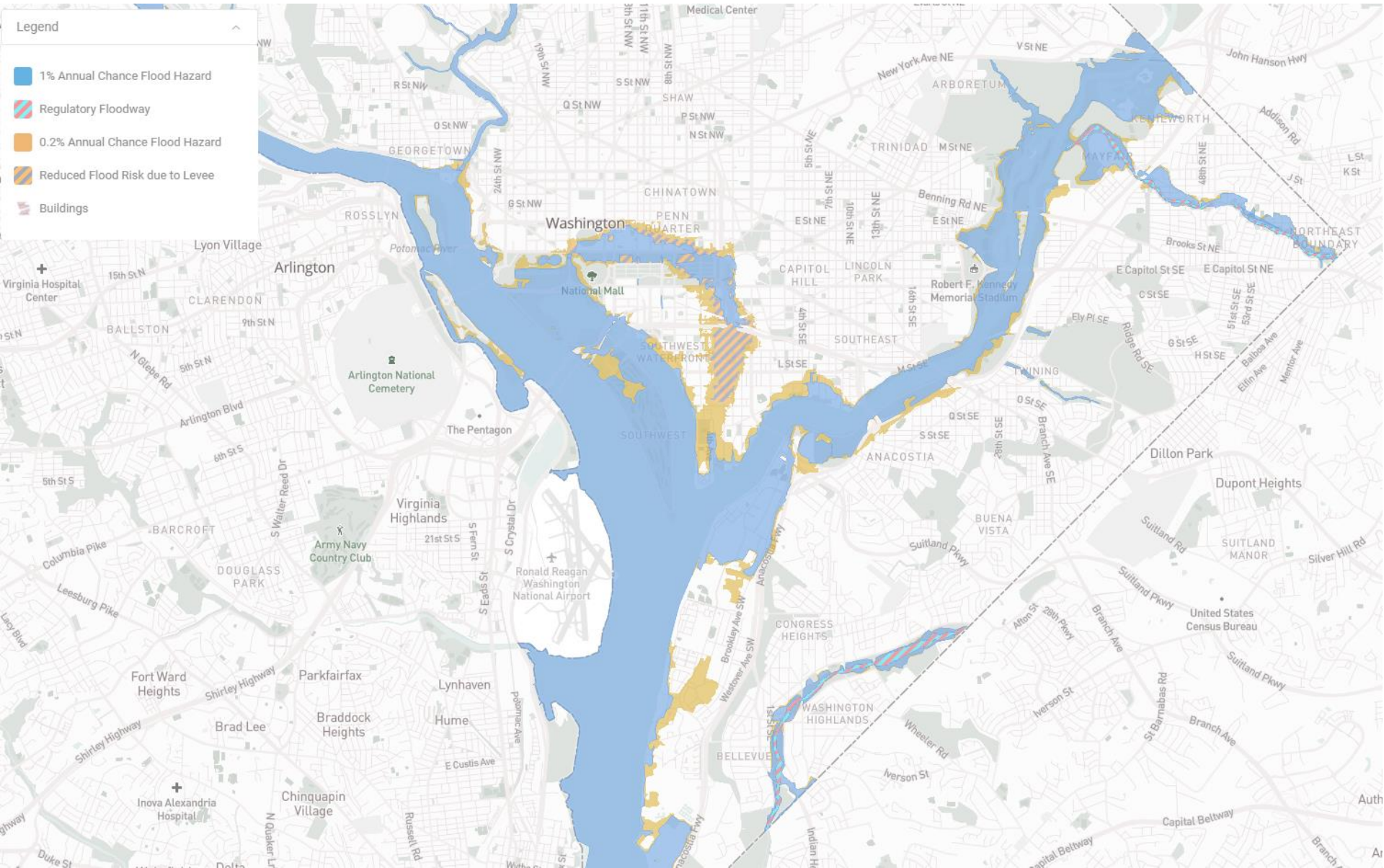
# Today's Agenda

- What We Regulate Now (and Why)
- Why Update Now
- Proposed Changes to the Regulations
- Next Steps & Overview of Upcoming Workshops

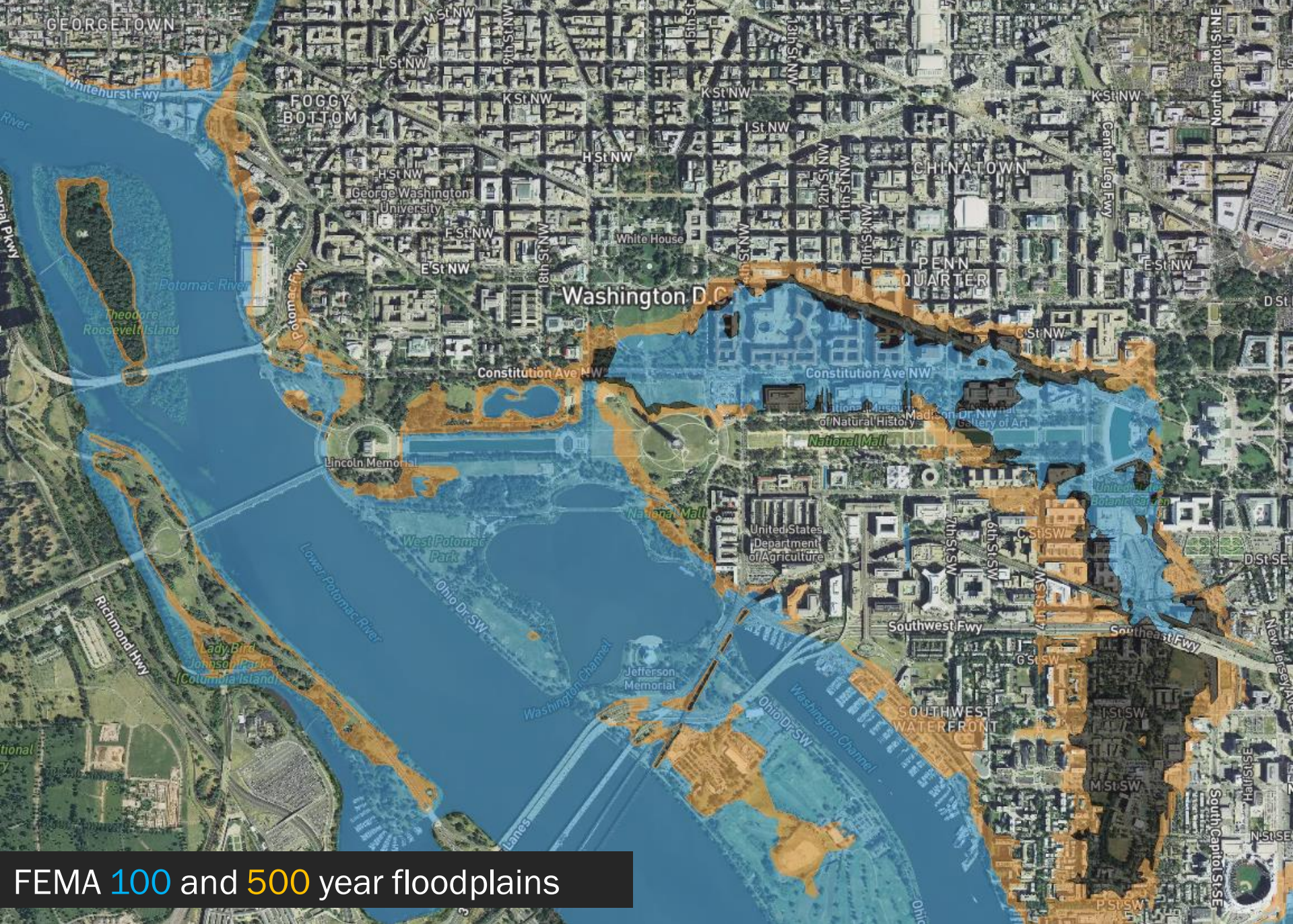
But First....  
Interactive Polling!

# What We Regulate Now

# The District's Floodplains



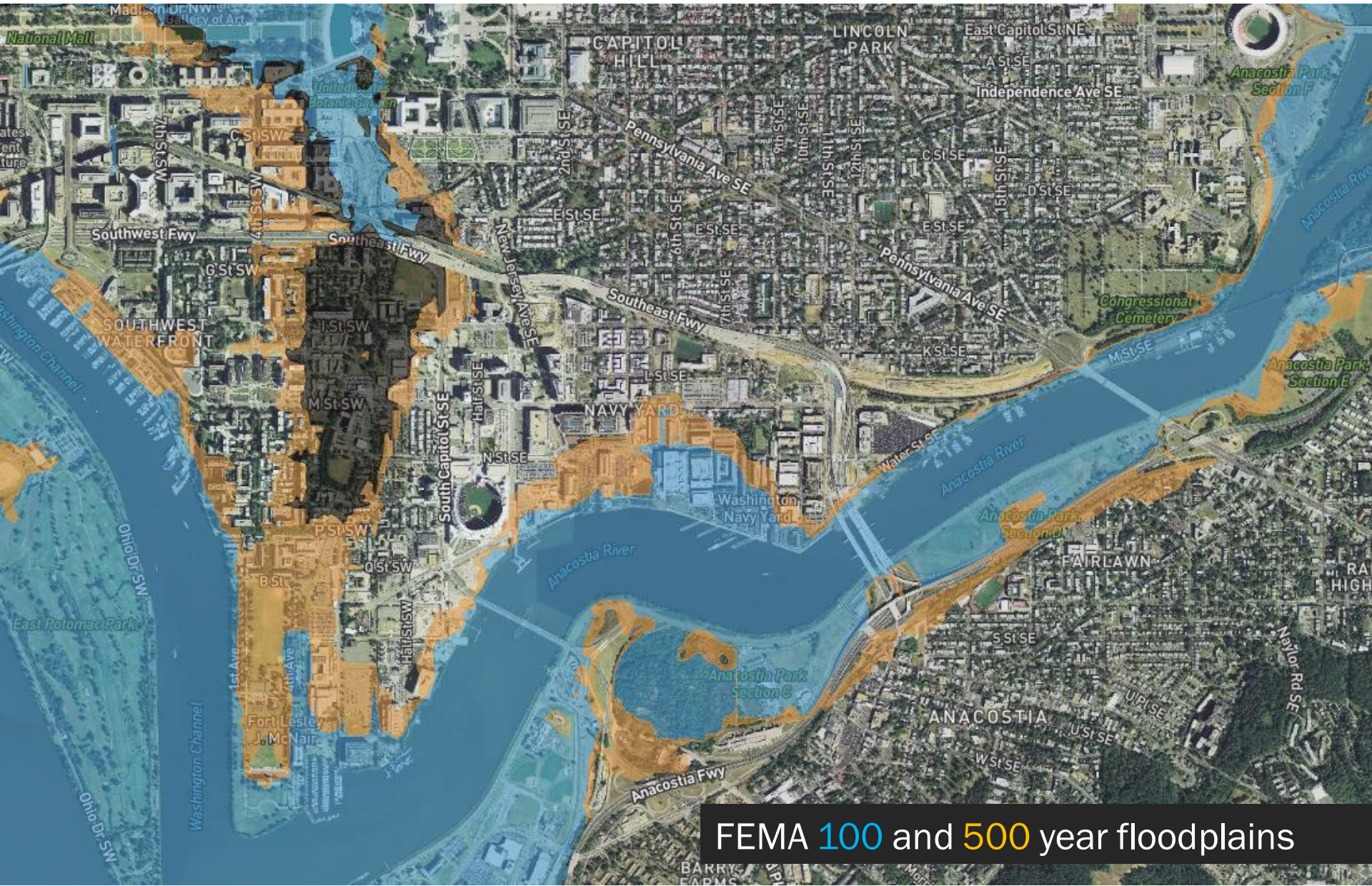




FEMA 100 and 500 year floodplains

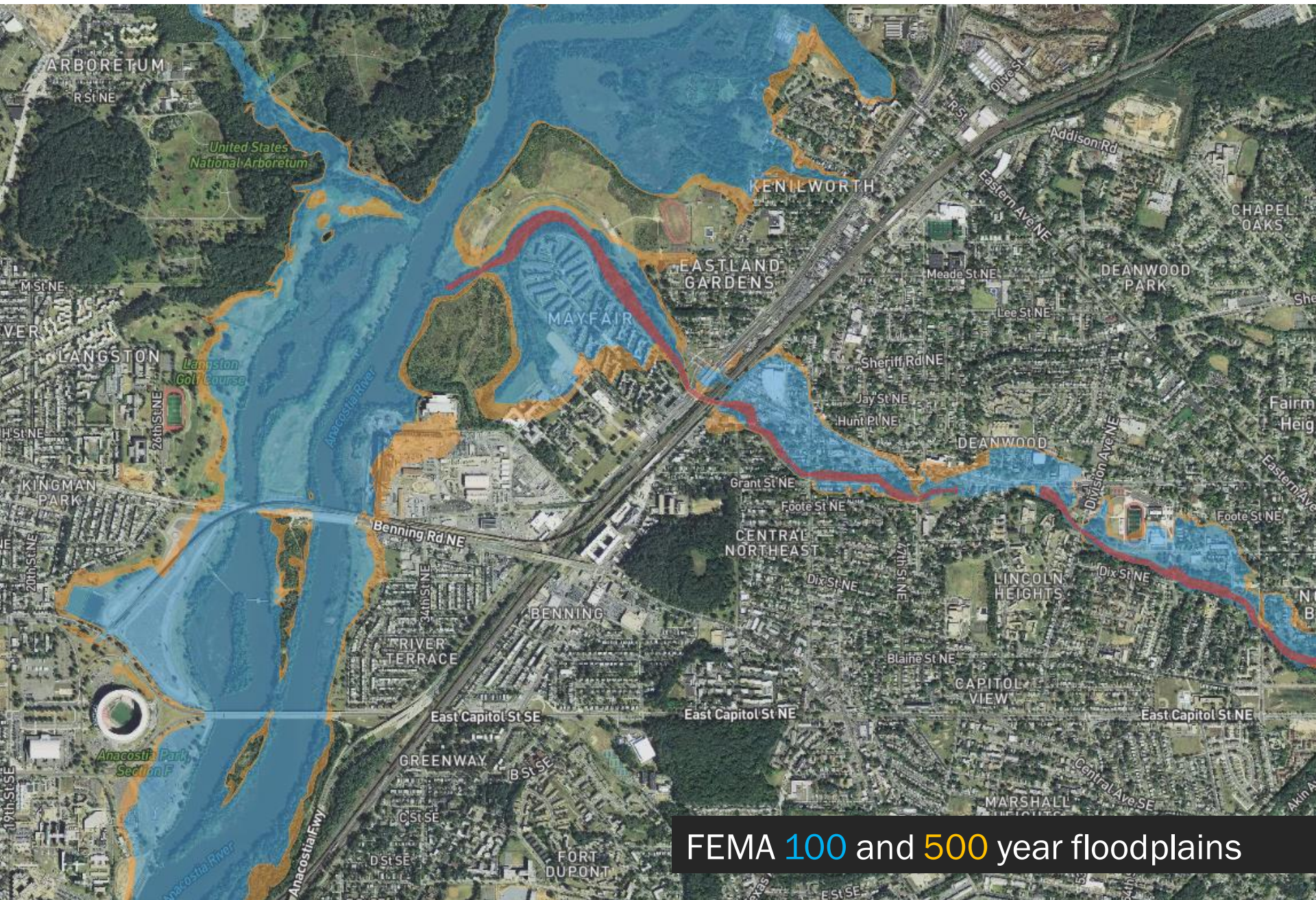
DC Flood Risk Tool: <http://dcfloodrisk.org/>





FEMA 100 and 500 year floodplains





FEMA 100 and 500 year floodplains



# Why do we have Regulations?

- Required for communities if they want the benefits of participating in the National Flood Insurance Program (NFIP)
- Protect life and property
- Protect the important environmental functions of floodplains
- DC has flood risk!

# River + Coastal Flooding

- Flooding caused from overflow of banks of Anacostia or Potomac Rivers and tributaries
- Mapped by FEMA





# Interior Flooding

- Caused by intense rainfall, impervious surfaces, and limited drainage
- ***Not Mapped by FEMA, Not Regulated*** (Except Federal Triangle)
- Soon to be mapped by DC DOEE Integrated Flood Model (IFM)



Why Update Now?



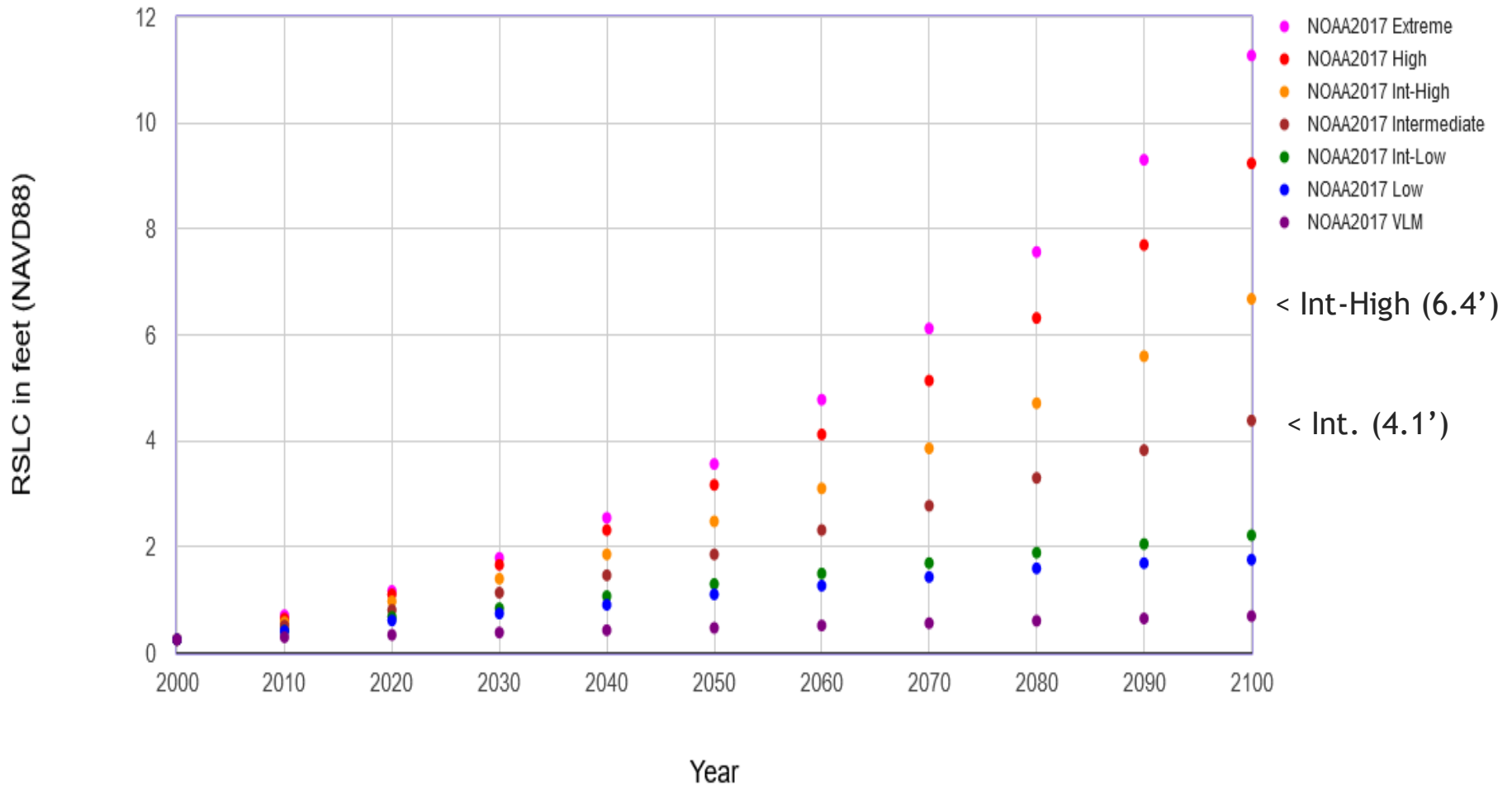
# Federal & District Priorities

- FEMA requirements - Community Assistance Visit (CAV)
- DCRA's Construction Codes - Appendix G Updated in May 2020
- Comprehensive Plan Implementation\*
- Climate Ready DC\*
- Sustainable DC\*
- Resilient DC\*

**Preparing for  
Climate Change**

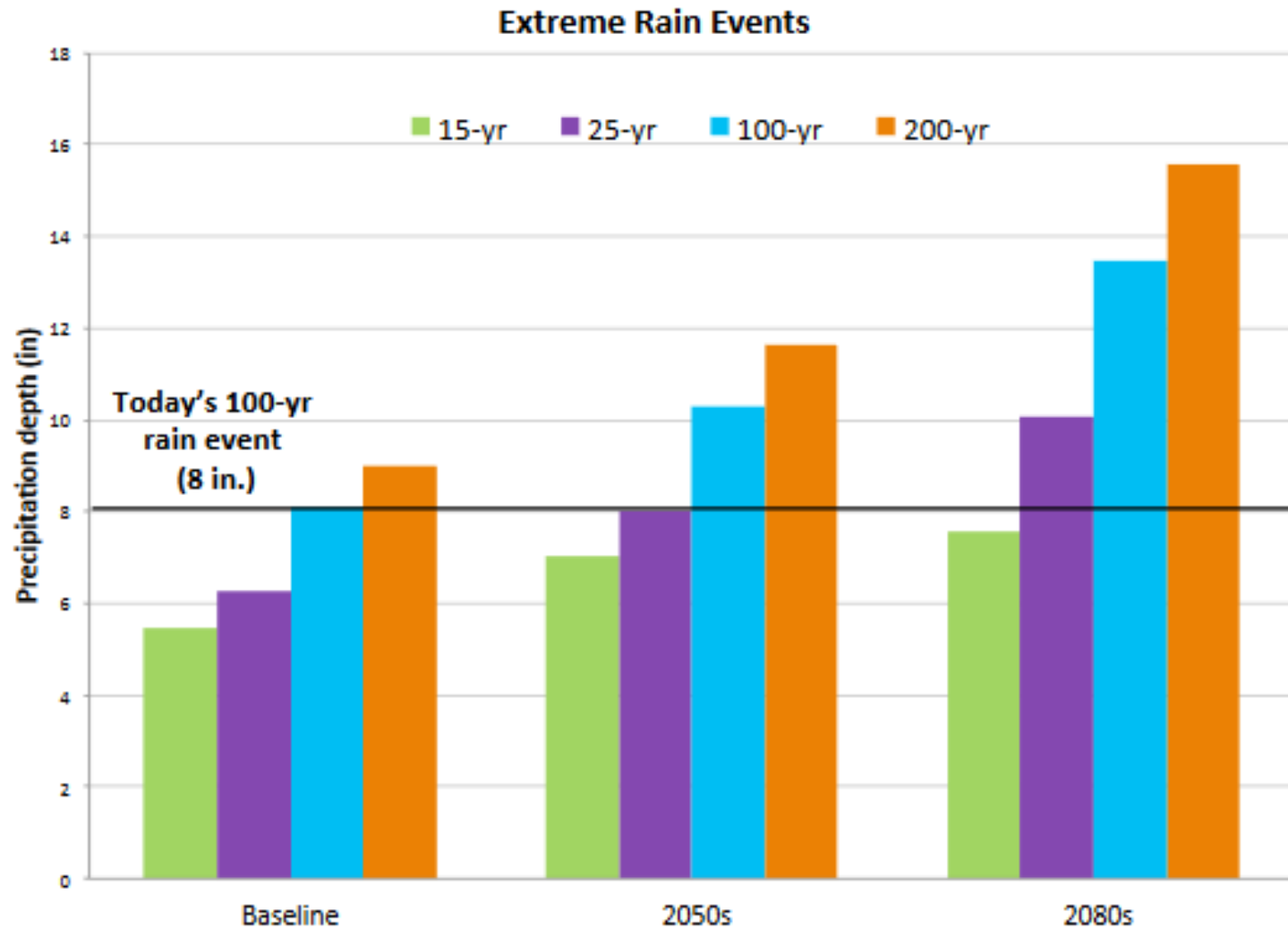
# Sea Level Rise in Washington, DC

NOAA et al. 2017 Relative Sea Level Change Scenarios for : WASHINGTON DC





# Rainfall Projections – Climate Ready DC



# Proposed Changes to the Regulations



# Process – What we've done so far

- Spring 2020: Presented initial proposal to DCBIA, Environmental Stakeholders, and District Agencies
- Summer 2020: Presented to DCHA, DDOT, DGS, DMPED, DPR, Poplar Point Stakeholders, D.C. Commission on Climate Change and Resiliency
- Fall 2020: Presented to DCPS, HSEMA, Critical Infrastructure Stakeholders, DCOP

# What would change?

- Terms
  - Fees
  - Regulated Areas
  - Design Flood Elevations
  - Mixed Use
  - Insurance Requirements
- No Adverse Impact
  - Hazardous Materials
  - Historic Structures
  - Critical Facilities
  - Buffer Areas



# What would change? – Regulated Areas

## Current Flood Hazard Rule:

- Special Flood Hazard Areas
  - FEMA 100-year floodplain
  - Only area regulated

## Proposed Update:

- Flood Hazard Areas
  - FEMA 100- and 500-year floodplains
    - Precedents in Baltimore, Houston, Austin, Charlotte, etc.
  - Areas removed from FEMA's 100-year floodplain by LOMR-F

# Property and Structures in Regulated Areas

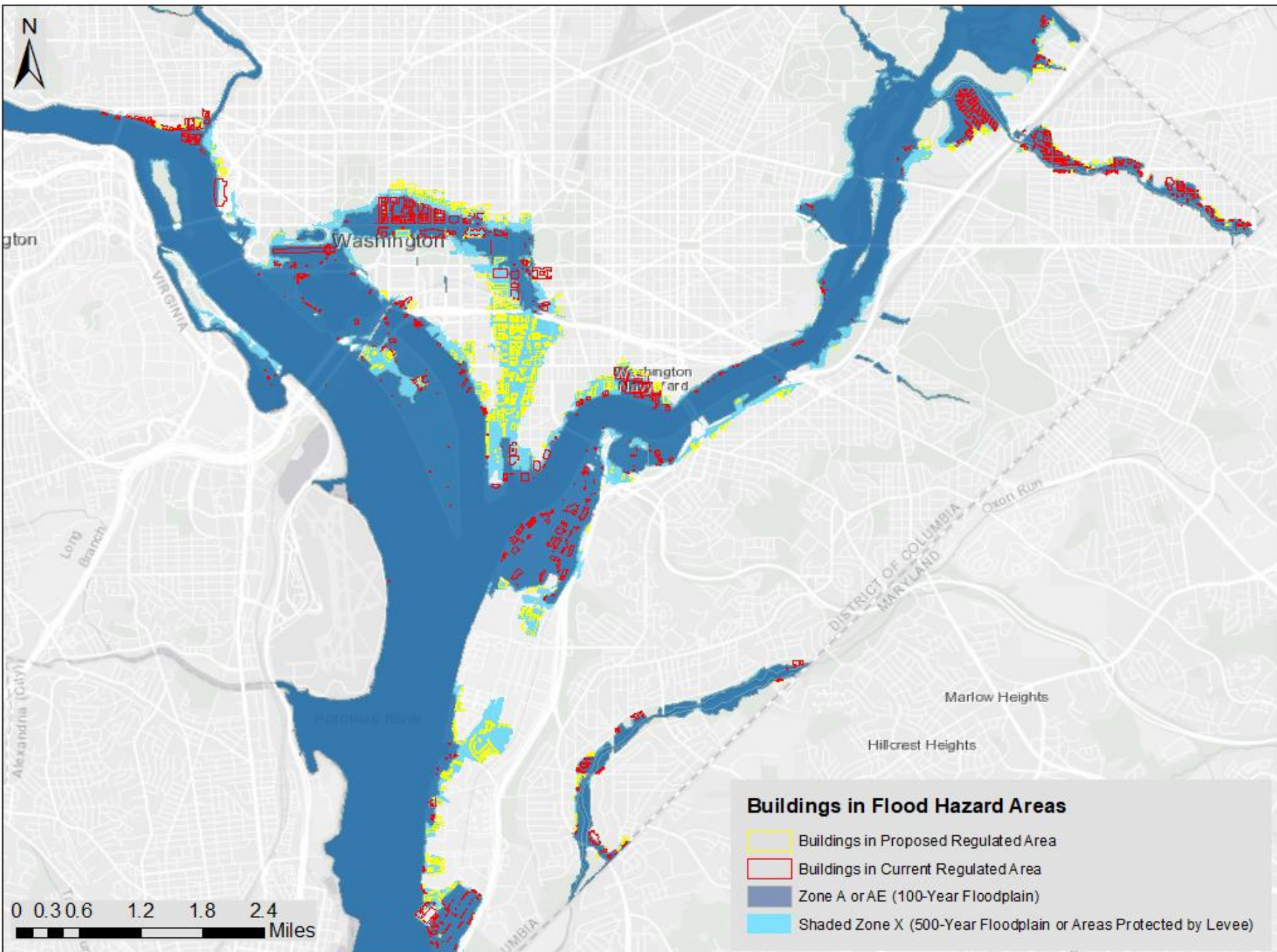
	Total in DC (Estimate)	Current Regulated Area	Proposed Regulated Area	% of Total in Regulated Area - Current	% of Total in Regulated Area - Proposed	Source
<b>Structures</b>	162,648	1,354	2,471 (+1,117)	0.8	1.5	DC Open Data: Planimetric 2017, "Building Footprints 2017"
<b>Common Ownership Lots</b>	137,099	1,780	2,696 (+916)	1.3	2.0	<a href="#">DC Open Data</a>
<b>Acres</b>	43,854	7,723	8,877 (+1,154)	17.6	20.2	DCfloodrisk.org



# Uses in 500-Year Floodplain Areas

	<b>Predominant Use (# of Buildings)</b>	<b>Predominant Use (Acreage)</b>
<b>Overall</b>	Garage/Unimproved Land (619)	Commercial (72%)
<b>Residential</b>	Row-Single-Family (172)	Detached-Single-Family (66%)
<b>Commercial</b>	Other-Special-Purpose-Misc (132)	Other-Special-Purpose-Misc (56%)

Source of data is District Appraiser's office CAMA (Computer-Assisted Mass Appraisal)



**Buildings in Flood Hazard Areas**

- Buildings in Proposed Regulated Area
- Buildings in Current Regulated Area
- Zone A or AE (100-Year Floodplain)
- Shaded Zone X (500-Year Floodplain or Areas Protected by Levee)

0 0.3 0.6 1.2 1.8 2.4 Miles

# What would change for single family homes? – Regulated Areas

## FEMA Requirements for 100-Year Floodplain

- Below-grade enclosures prohibited at all residential structures

## Proposed Local Exemptions in 500-Year Floodplain:

- Existing residential basements in low-hazard areas can be:
  - Dry-floodproofed with no use restrictions
  - Retained if used only for storage & enclosure of elevated/floodproofed utility equipment



# What would change for multifamily buildings? – Regulated Areas

## FEMA Requirements for 100-Year Floodplain

- Below-grade enclosures prohibited at all residential structures
- Ancillary residential uses (i.e. mailroom, gym, lobby) must be elevated

## Proposed Local Exemptions in 500-Year Floodplain:

- Multifamily residential buildings can install dry-floodproofed underground parking garages
- Ancillary residential uses can be elevated or dry-floodproofed

# What would change? – Design Flood Elevation

## Current Flood Hazard Rule:

All new and substantially improved buildings must be elevated or floodproofed to the:

- Base flood elevation (BFE) + 1.5 feet

## Current DC Construction Codes:

All new and substantially improved buildings must be elevated or floodproofed to the:

- Base flood elevation + 2 feet
- or High flood elevation, whichever is higher

## Proposed Update to Flood Hazard

### Rule:

All new and substantially improved buildings must be elevated or floodproofed to the:

- Base flood elevation + 2 feet
- or High flood elevation, whichever is higher

# What would change? – Mixed Use\*

## Current Flood Hazard Rule:

- Not addressed
- Has been grey area for FEMA
- DCRA Administrative Bulletin in 2016 requires code modification if entire building not elevated above 100-year elevation
- DOEE has required use of 500-year floodproofing standard as condition of support for code modification

## Proposed Update:

- Better define mixed use, residential use, non-residential use
- Lowest floor of residential portion must be above DFE
  - Ancillary residential uses in 500-year zone can be dry floodproofed
- Requires 500-year standard (for all buildings)
- Allows dry floodproofing of non-residential portions to DFE, including underground parking by right



# What would change? – Flood Insurance

## Current Flood Hazard Rule:

- No insurance requirement
  - There is a FEMA mandatory flood insurance requirement within the 100-year floodplain for properties with federally backed loans, but that is enforced directly by banks.

## Proposed Update:

- Proof of flood insurance
  - In flood hazard areas
  - Prior to final inspection & continuing for life of structure
  - Amount Required is lesser of:
    - The maximum amount available under the NFIP for the type of structure, or
    - The insurable value of the property minus the value of the land on which it is located.

# What would change? – No Adverse Impact

## Current Flood Hazard Rule:

- Allows no increase in 100-year flood elevations in floodway
- Allows an increase in 100-year flood elevations up to 1-ft

## Proposed Update:

- Allows no increase in 100-year flood elevations in floodway
- Allows *no increase* in 100-year or 500-year flood elevations on anyone else's property.

# What would change? – Hazardous Materials

## Current Flood Hazard Rule:

- Existing provision has
  - one threshold (550 gallons)
  - List of 18 substances
- Not enforced

## Proposed Update:

- Relies on several hazmat laws to identify relevant properties that have reporting requirements
- Requires a flood emergency action plan during any permit review
- Draft plan template based on Maryland standards for marina facilities



# What would change? – Historic Structures

## Current Flood Hazard Rule:

- Not addressed

## Proposed Update:

- Requires coordinated review with SHPO
- Must show that flood proofing is achieved to the maximum extent practicable while still maintaining historic designation
- SHPO has expressed support

# What would change? – Critical Facilities

## Current Flood Hazard Rule:

- Not addressed
- references ASCE design standard (ASCE 24)

## Proposed Update:

- Critical Facilities defined
  - Flood Design Class 4 structures (ASCE 24)
  - Some Flood Design Class 3 structures (ASCE 24)
- Prohibit new or substantially improved critical facilities in flood hazard areas without variance or alternatives analysis
- If variance granted, requires more stringent protective measures (i.e. DFE = 500 year +2')
- Potential HSEMA Role in Review

# Critical Facilities during Sandy and Harvey



Assisted living facility in 100-year floodplain during Hurricane Harvey.



Photo courtesy FEMA

Hoboken University Medical Center after Hurricane Sandy

# Proposed Critical Facilities List

## Vulnerable Populations

- Hospitals and health care facilities having surgery or emergency treatment facilities;
- Jails, correctional facilities, and detention facilities;
- Care facilities where residents have limited mobility or ability, including nursing homes but not including care facilities for five or fewer persons;
- Shelters and short-term family housing facilities for individuals experiencing homelessness;
- Elementary and secondary schools
- Preschool and child care facilities not located in one-and two-family dwellings.

## Essential Functions

- Fire, rescue, ambulance, and police stations and emergency vehicle garages;
- Designated emergency shelters;
- Designated emergency preparedness, communication, and operation centers and other facilities required for emergency response;
- Power generating stations and other public utility facilities required in emergencies;
- Critical aviation facilities such as control towers, air traffic control centers, and hangars for aircraft used in emergency response;
- Ancillary structures such as communication towers, electrical substations, fuel or water storage tanks, or other structures necessary to allow continued functioning of a critical facility during and after an emergency.



# What would change? – Buffer Areas\*

## Current Flood Hazard Rule:

- No buffers

## Proposed Update:

- Tidal Shoreline Buffer \*
  - Areas to be inundated by Sea Level Rise in future decades
  - New development must be protected to **High flood + TBD** ft. to account for NOAA predicted sea level rise.
  - Review by OP for harmony with surrounding urban design

# Tidal Shoreline Buffer Calculation

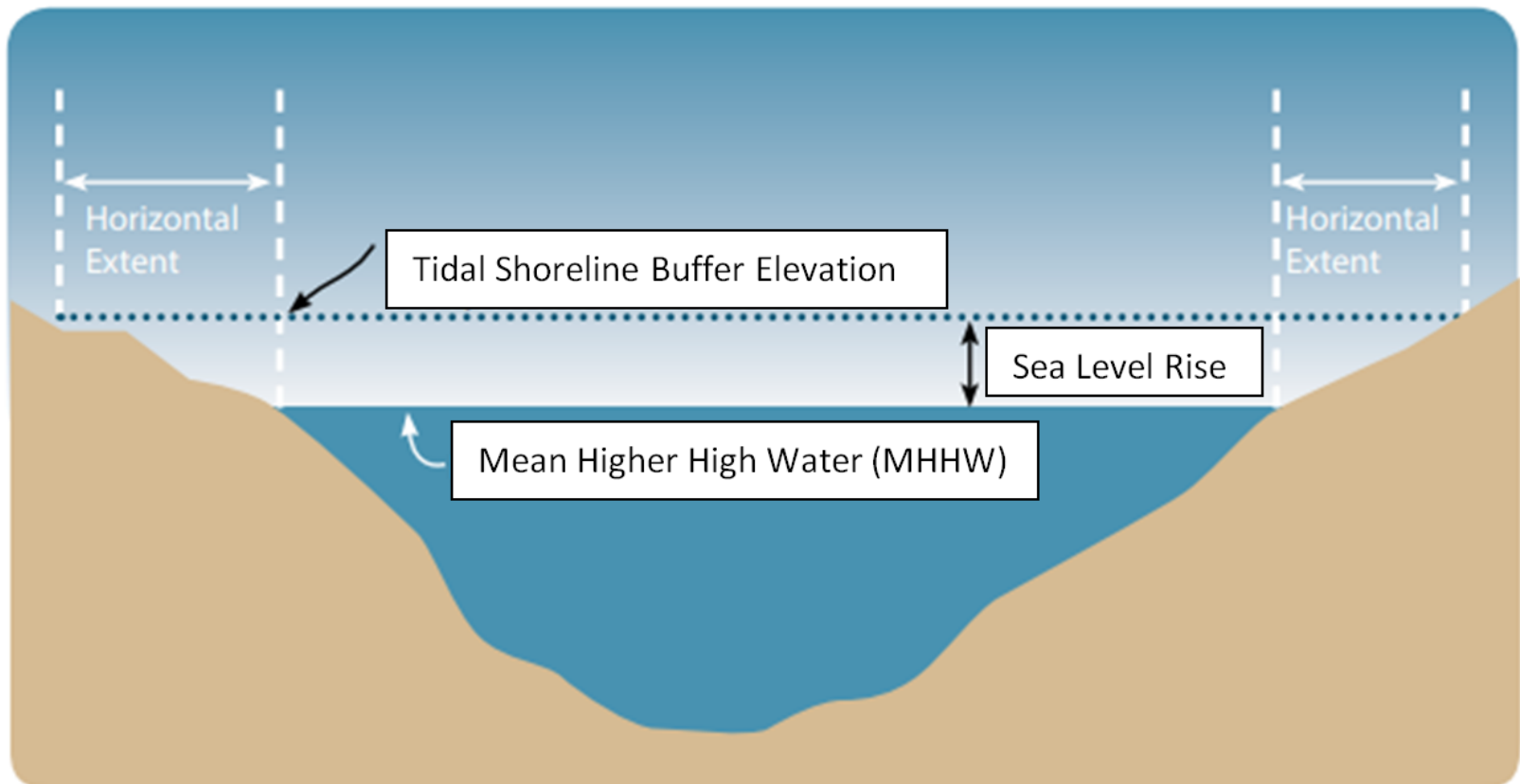
Mean Higher High Water (MHHW) in the year 2000: 2.2' NAVD88

+

Relative Sea Level Rise between the year 2000 and 2100: 6.4'

=

Tidal Shoreline Buffer Elevation (MHHW in the year 2100): 8.6' NAVD88



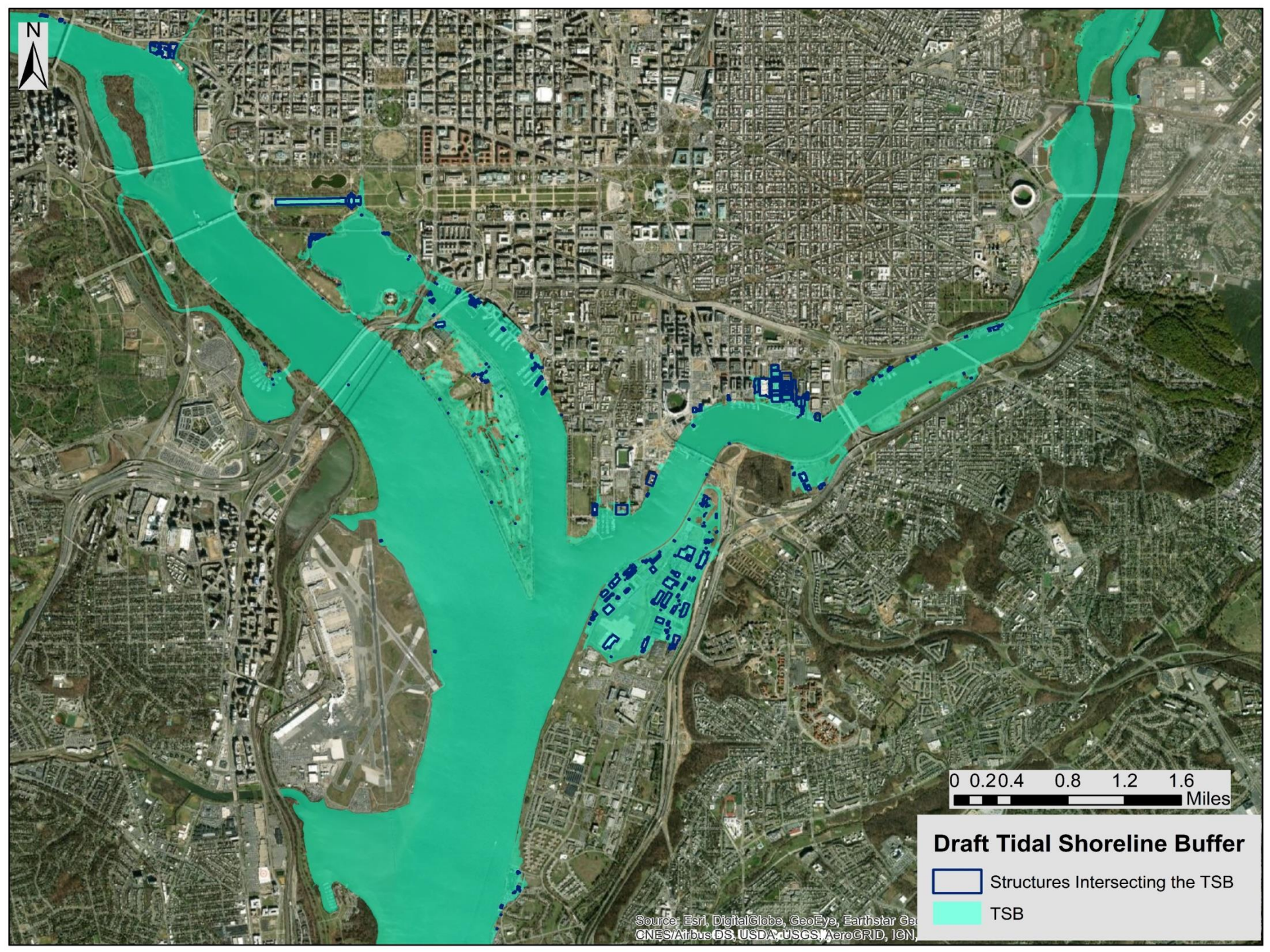


0 0.125 0.25 0.5 0.75 1  
Miles


**Draft Tidal Shoreline Buffer**  
TSB

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNR/Air Force, USDA, USDA, AeroGRID, IGN, and the GIS User Community





**Draft Tidal Shoreline Buffer**

-  Structures Intersecting the TSB
-  TSB

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN,



# Draft Tidal Shoreline Buffer

	Total in DC (Estimate)	Tidal Shoreline Buffer	% of Total in TSB	Source
<b>Structures</b>	162,648	295	0.18	DC Open Data: Planimetric 2017, "Building Footprints 2017"
<b>Common Ownership Lots</b>	137,099	263	0.19	<u>DC Open Data</u>
<b>Acres</b>	43,854	1681.3	3.83	DCfloodrisk.org



# Summary – Required Elevations

<i>Structure Type</i>	<i>Regulations</i>	<i>Design Flood Elevation</i>	<i>Notes</i>
General	Current Flood Hazard Rules	<b>100-Year Flood Elevation + 1.5 feet</b>	Residential structures must be elevated, while nonresidential structures can be elevated or dry floodproofed.
General	Current DC Construction Codes and Proposed Updated Flood Hazard Rules	<b>Whichever is higher of:</b> <ul style="list-style-type: none"> <li>• <b>100-Year Flood Elevation + 2 feet,</b></li> <li>or</li> <li>• <b>500-Year Flood Elevation</b></li> </ul>	Residential structures must be elevated, while nonresidential structures can be elevated or dry floodproofed.
Critical Facility	Proposed Updated Flood Hazard Rules	<b>500-Year Flood Elevation + 2 feet</b>	Residential structures must be elevated, while nonresidential structures can be elevated or dry floodproofed.
Structure Located Within the Tidal Shoreline Buffer	Proposed Updated Flood Hazard Rules	<b>500-Year Flood Elevation + TBD feet</b>	Residential structures must be elevated, while nonresidential structures can be elevated or dry floodproofed.

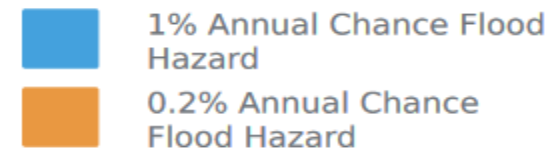
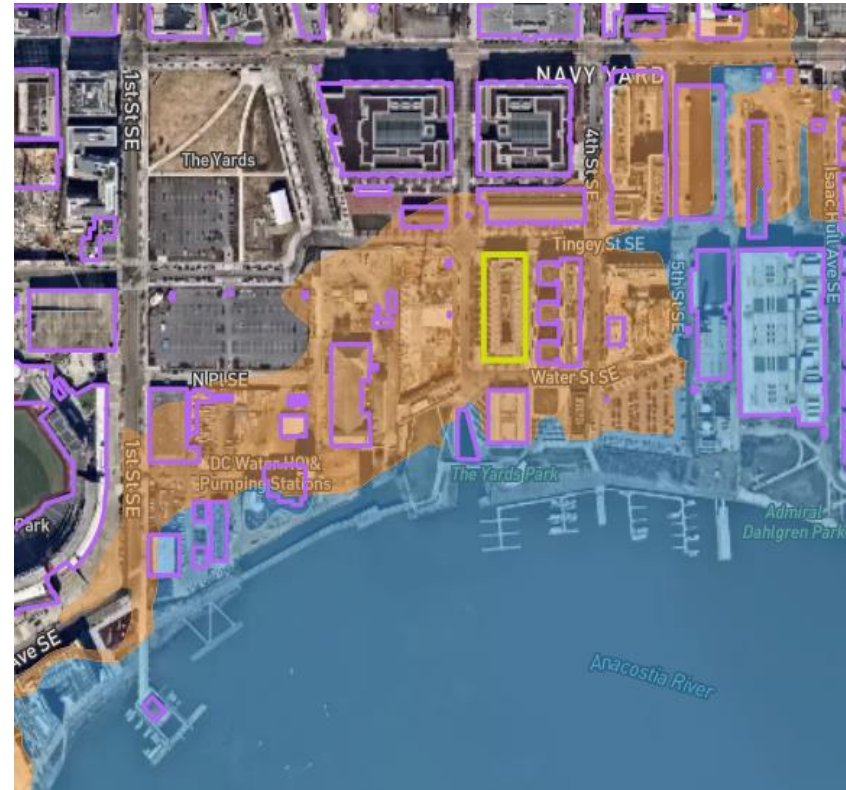
# Case Study – 300 Water Street SE

High Flood Elevation = 14.0 ft.

-> Design Flood Elevation = 14.0 ft.

LiDAR-Estimated Lowest Adjacent Grade = 12 ft.

Elevation or Floodproofing Necessary



# Transition Plan\*

- Updated Flood Hazard Rules will be enforced following a transition period after final publication (similar to updated Stormwater Management Regulations).

# Summary – Changes from Initial Meeting

- Dry-Floodproofed Underground Parking Allowable for All Use Categories in Shaded Zone X Floodplain (500-Year)
- Existing Residential Basements can be Retained with Use Restrictions in Shaded Zone X Floodplain
- Development Standards for Public Housing Synchronized with Those for Privately-Owned Housing
- Removed DC Parkland Buffer

# Next Steps & Overview of Upcoming Workshops



# Upcoming Technical Workshops

- **Workshop #1** - Tuesday, April 20 - Overview
- **Workshop #2** - Thursday, April 29 - Mapping
- **Workshop #3** - Thursday, May 20 - Vesting and Transition
- **Workshop #4** - Thursday, June 10 - Commercial, Mixed-Use, and Multifamily Development

*\*All Workshops from 2:30pm to 4:00pm*

# Workshop #2 - Mapping

- Standard Design Flood Elevations
  - Rationale for 100-year +2' / 500-year elevation
- Tidal Shoreline Buffer (TSB)
  - Underlying Sea Level Rise Projections
  - Horizontal Extent
  - Required Design Elevation in TSB
- Map Maintenance Procedures
  - Flood Protection Structures and their Ability to Remove Property from a Regulatory Floodplain

# Workshop #3 – Vesting and Transition

- Criteria for Vesting Under Current Flood Hazard Rules
- Project Phases in which Level of Protection is Set
- Transition Period Timeframe

# Workshop #4 – Commercial, Mixed-Use, and Multifamily Development

- Allowable Below-Grade Uses in the 500-Year Floodplain
- Underground Parking
- Differences in Requirements Between 100-Year and 500-Year Floodplain

# Process - Next Steps

- Spring/Summer 2021: Launch community leader, resident, and single-family homeowner working group.
- Summer 2021: Incorporate feedback into revised draft.
- 2021 and Beyond: DOEE aims to begin the *formal* public rulemaking process, which includes:
  - DC Government internal approval process
  - Publication of proposed rules in the DC Register
  - A formal comment period available to all stakeholders
  - Consideration of formal public comments
  - Ultimately, publication of final rules in the DC Register
  - Will be a transition period



# Interactive Polling!

# Discussion

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Martin Koch

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# Appendix

# Comprehensive Plan Coordination

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## Environmental Protection Element

- Section 603.3/Policy E.1.1: "...expanding the regulated floodplain areas in Washington, DC beyond the 100-year floodplain..."
- Section 603.10/Policy E-1.1.6: "...prohibit[ing] activities within floodplains, waterfronts, and other low-lying areas...that could pose public health or safety hazards in the event of a flood..."
- Action E-1.1.A: "Update Regulations for Resilience. Continue to monitor and update Washington, DC's regulations to promote flood risk reduction, heat island mitigation, stormwater management, renewable energy, and energy resilience, among other practices, where appropriate."
- Action E-1.1.C: "Waterfront Setbacks. Ensure that waterfront setbacks and buffers account for future sea level rise, changes in precipitation patterns, and greater use of nature-based and adaptive flood defenses."
- Action E-1.1.E: "Update Floodplain Regulations. Update flood hazard rules to reflect the increased risk of flooding due to climate-related sea level rise, increasingly frequent and severe precipitation events, and coastal storms."

# Comprehensive Plan Coordination

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## Land Use Element

- Section 305.16/Policy LU-1.2.8: “New waterfront development [to] actively address flood risk and incorporate adaptive siting and design measures”

## Housing Element

- Section 508.6/Policy H-1.6.2: “Improv[ing] the structural resilience of existing housing units that are at risk from natural hazards through the promotion of mitigation techniques, such as building upgrades and elevating electrical or mechanical equipment above designated flood elevations.”



# Climate Ready DC Coordination



## LETTER FROM MAYOR MURIEL BOWSER

Climate change is no longer a distant threat. In order to prepare Washington, DC for the future, we can and must respond to new and substantial challenges created by climate change. Climate Ready DC is our plan for adapting to a changing climate that could bring more dangerous heatwaves, severe storms, and flooding along our rivers. For the development of this plan, we partnered with leading climate scientists to assess our vulnerabilities and identify solutions to reduce our risks. We have also listened to your ideas for how to build stronger, more resilient communities.

The good news is that we are well on our way to building a Climate Ready DC. The District's investments in expanding our tree canopy, managing stormwater, and greening our construction codes are helping us to prepare for hotter summers and heavier rains. Our programs to save energy and install solar energy are also helping to make our power system more durable.

But, we have much more work to do to ensure that all District residents are protected—in particular those who are most economically and physically vulnerable—and we cannot do it alone. Implementing our plan will involve input from residents and stakeholders in all eight wards.

Together, we can build a nation's capital that is not only climate ready, but stronger, healthier, and more resilient.

Sincerely,

A handwritten signature in black ink that reads "Muriel Bowser". The signature is fluid and cursive, with the first name being the most prominent.

Muriel Bowser  
Mayor

# Climate Ready DC Coordination

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BD (Buildings + Development) 10.3: "Propose amendments to floodplain regulations and zoning and land use policies to ensure that waterfront setbacks and buffers allow for future sea-level rise, changes in precipitation patterns, sustainable landscaping practices, erosion, and reduce flood risks."

BD 10.4: "Develop a set of flood resilience guidelines for the 500-year floodplain in addition to those existing for the 100-year floodplain for new development and substantial improvements."

BD 10.5: "Propose regulations that limit the development of new critical facilities including hospitals, emergency services, shelter facilities and critical infrastructure systems within the 500-year floodplain."

BD 6.2: "Flood proof the most critical facilities to protect against future events accounting for sea level rise and increasingly severe precipitation events."

# Sustainable DC Coordination

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CL (Climate) 2.1: "Evaluate and reduce the vulnerability of the District's transportation, energy, water, and telecommunications infrastructure to the anticipated impacts of climate change [extreme weather, heat, or flooding]."

CL 2.2: "Improve emergency and community preparedness to respond to climate change events including extreme heat, storms, and flooding, with a focus on the most at-risk populations."

CL 2.3: "Require all new development projects to assess climate risks and incorporate climate adaptation solutions."

# Resilient DC Coordination

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Goal 2.1.1 "Ensure that all new buildings are built to be climate-ready by 2032"

- *"Strengthen requirements that would address increased heat and flood risk (such as passive survivability or a building's ability to support its occupants in the event of a power outage)."*

Goal 2.1.2 "Retrofit all at-risk buildings or remove them from high-risk areas by 2050"

- *"Develop, improve, and market a suite of existing and new programs, policies, outreach efforts, and regulations that fortify buildings to climate-related hazards."*

Goal 2.3.2: "Increase affordability and adoption of flood insurance."

- *"Take the necessary steps to bring the District's flood risk management program into good standing with FEMA, which administers the National Flood Insurance Program."*
- *"Take steps to increase awareness of and mitigate risk from flooding."*