CLIMATE READY DC

The District's Climate Adaptation & Preparedness Plan

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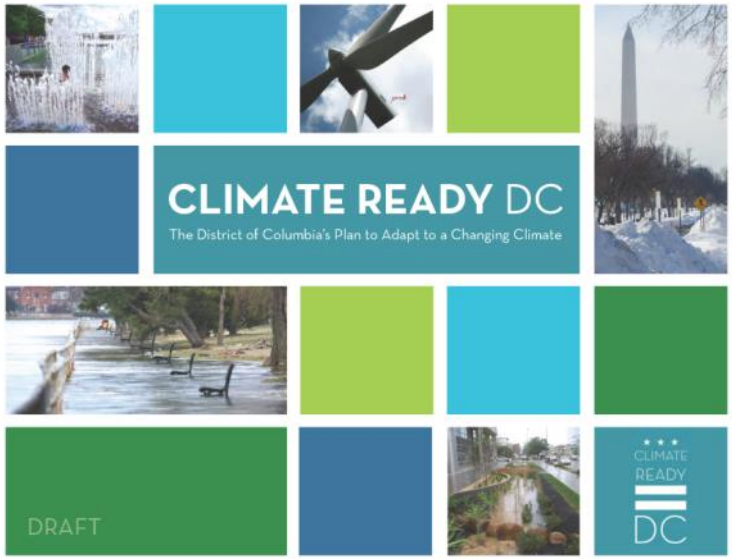
DEPARTMENT OF ENERGY & ENVIRONMENT

CLIMATE READY DC DEVELOPMENT



1. Analyze Climate Impacts
2. Assess Risks & Vulnerabilities
3. Identify & Prioritize Solutions

Projecting Local Climate Change - Downscaling

Downscaling is the process of incorporating local data into global climate models in order to translate the results to the local level.

Daily temperature, precipitation, and humidity projections for 1960-2100

Climate projections are averaged over 20-year periods:

Baseline (1981-2000)	2020s (2015-2034)	2050s (2045-2064)	2080s (2075-2094)

CLIMATE INDICATORS

Precipitation

Extreme Events

- # of days/year with rainfall at or above 1 in
- # of days/year with rainfall at or above 2 in
- 1-yr 24 hr storm (in)
- 2-yr 24 hr storm (in)
- 15-yr 24 hr storm (in)
- 25-yr 24 hr storm (in)
- 100-yr 24 hr storm (in)
- 200-yr 24 hr storm (in)
- 2-yr 6 hr storm (in)
- 15-yr 6 hr storm (in)
- 100-yr 6 hr storm (in)
- 200-yr 6 hr storm (in)
- 80^{th} Percentile storm (in)
- 90^{th} Percentile storm (in)
- 95^{th} Percentile storm (in)

Temperature

Average Temperature

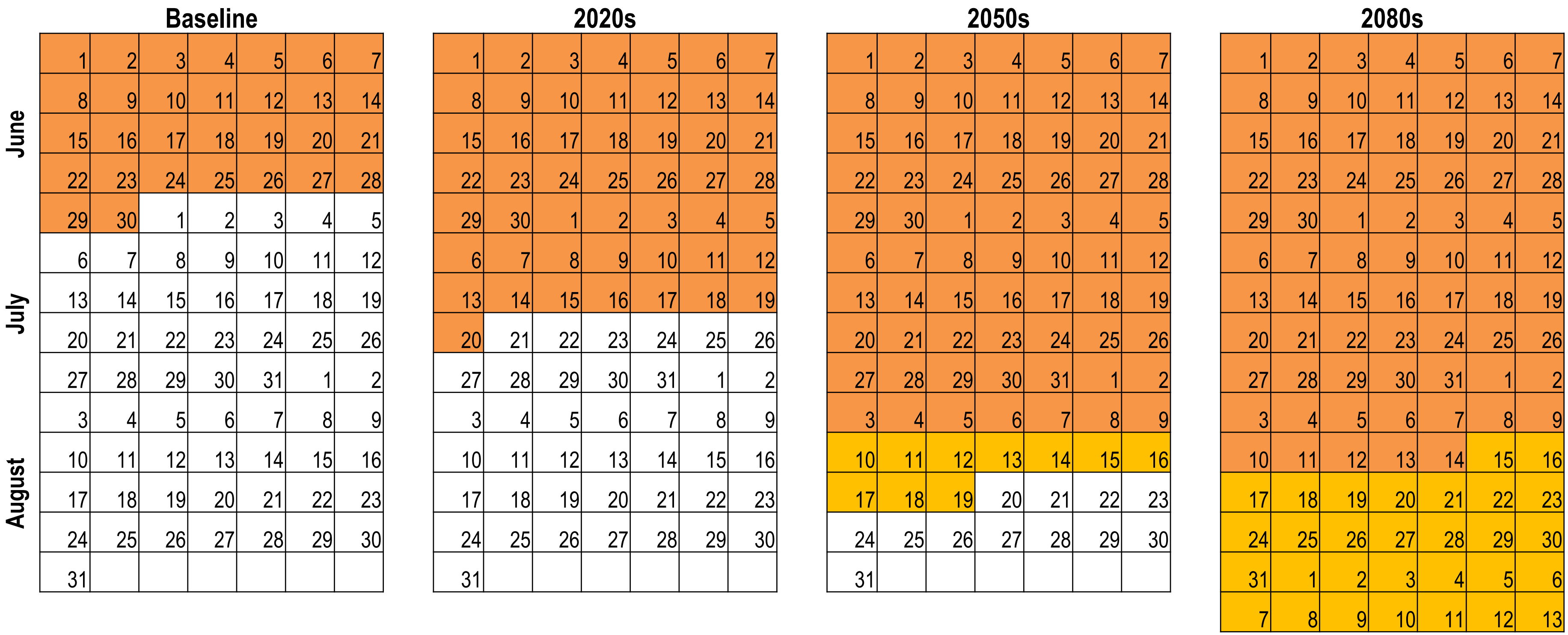
- Summer Maximum Temperature (daytime)
- Summer Minimum Temperature (nightime)

Extreme Events

- # of heat waves per year
- Avg heat wave duration (in days)
- # of days/yr with heat index at or above 95 ^{o}F
- # of days/yr with ambient temp at or above 95 ^{o}F
- Increase in frequency of the 2012 heat wave

Extreme Heat Events

Days over 95°F Heat Index



Baseline	2020s	2050s	2080s
30 days	**50** days	**70-80** days	**75-105** days

Days above 95°F Heat Index (low emission scenario)

Days above 95°F Heat Index (high emission scenario)

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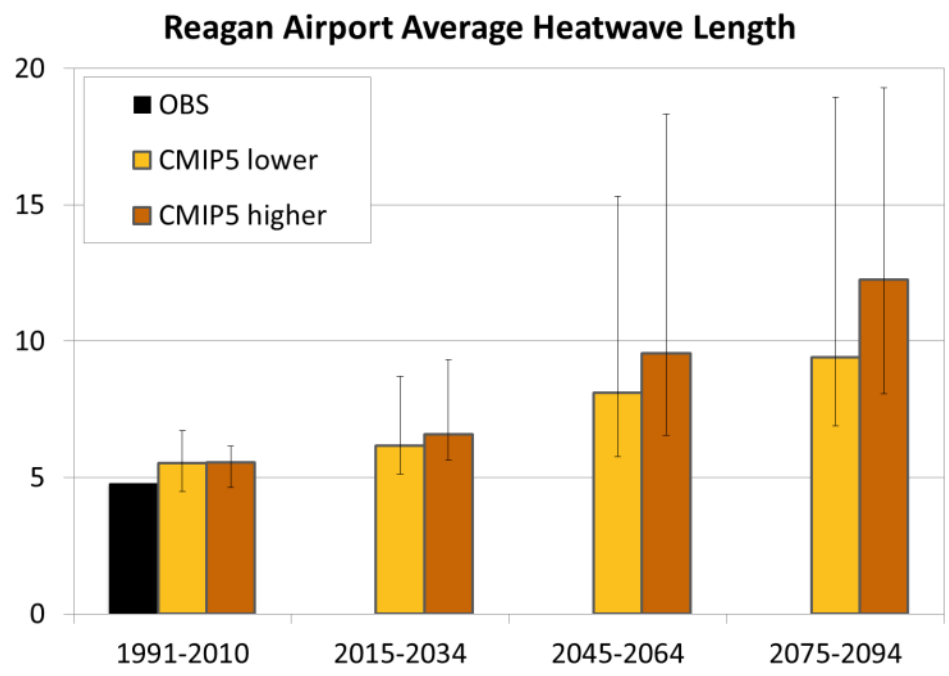
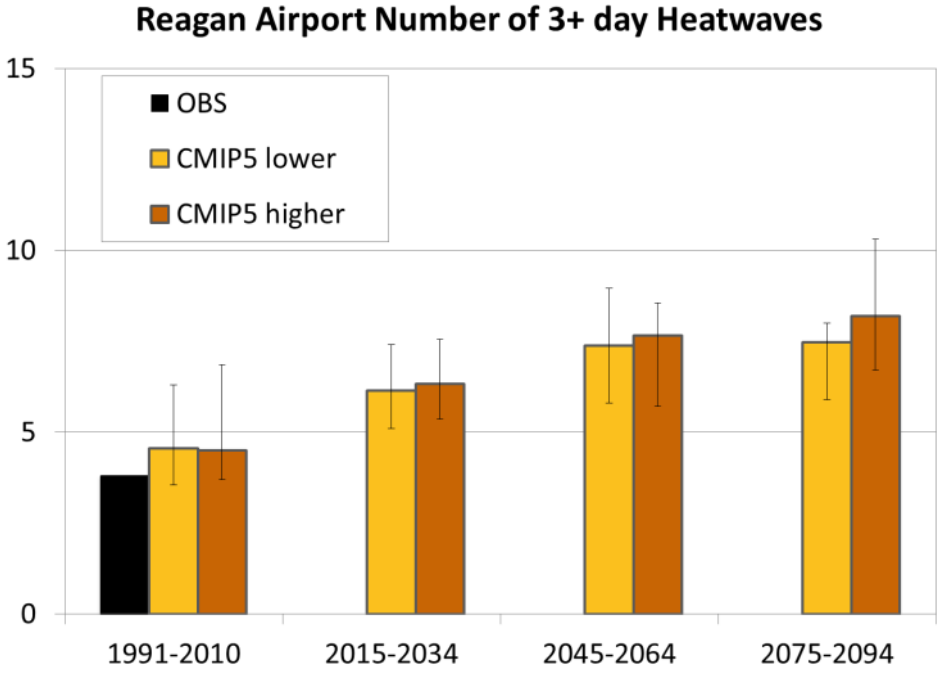
EXTREME HEAT EVENTS





Heat waves, defined as 3 consecutive days when the heat index is above 95°F, are projected to be more **frequent** and last **longer.**

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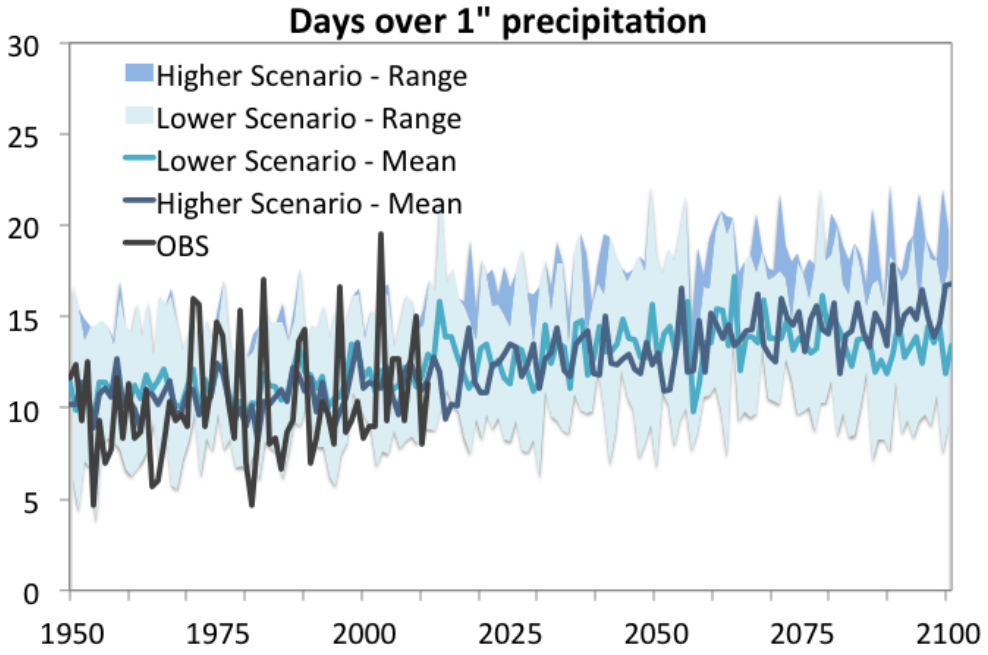
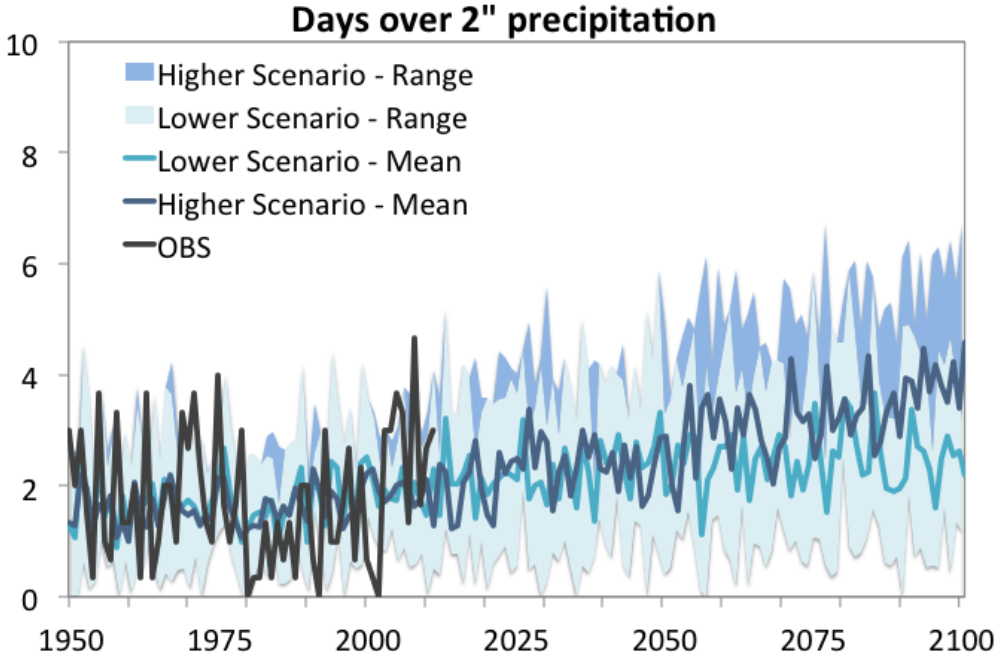
Precipitation Projections

Observed trends in measures of extreme precipitation are expected to continue to increase.

Charts show the number of days per year with more than 1” (top) and 2” (bottom) of precipitation in 24h.

By the 2080s the number of days per year with more than 2” of rain are expected to more than double from 2 days to 4.5 days under the higher scenario.





Design Storm Events

Changes in rainfall volumes have a significant impact on infrastructure.

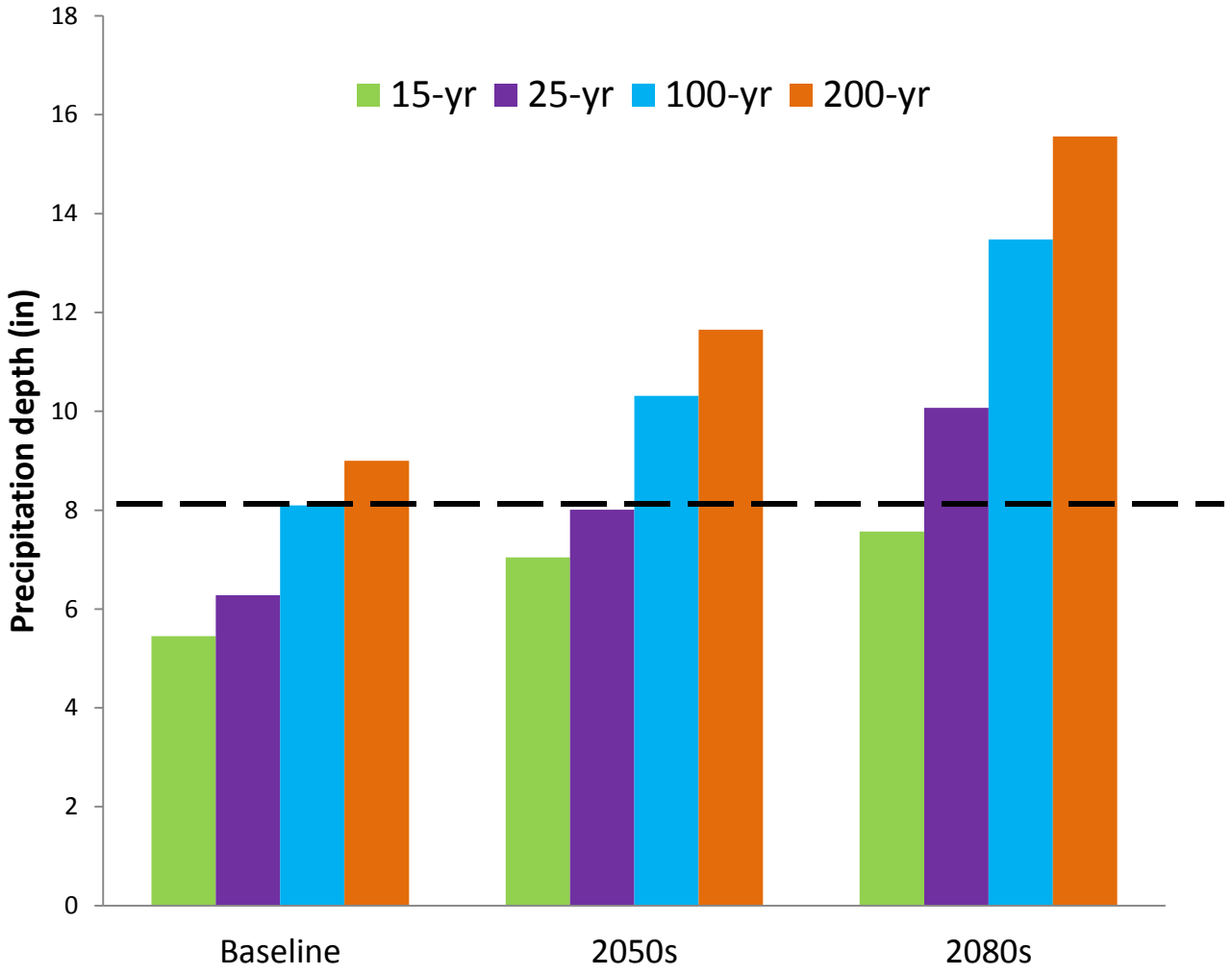
Design storms are the selected events that engineers use to design drainage infrastructure, bridges, culverts, etc.

Input from DC Water, DDOT and DDOE's Stormwater Management Division informed the selection of events that are used as standards for stormwater, wastewater, and transportation infrastructure.

The chart shows how rainfall volumes are projected to increase across the relevant design storm events, especially for the more extreme (100 and 200 year) events.

Design Storm	Baseline 1981-2000	2020s	2050s	2080s
1-yr 24 hr. storm (in)	1.6	1.7 (1.5 - 1.8)	1.7 (1.5 - 1.8)	2 (±<1)
2-yr 24 hr. storm (in)	3.2	3.4 (3.2 - 3.7)	3.7 (3.5 - 3.9)	4 (4 - 5)
15-yr 24 hr. storm (in)	5.5	6.8 (6.0 - 7.3)	7.1 (6.7 - 7.6)	8 (4 - 9)
25-yr 24 hr. storm (in)	6.3	7.9 (6.8 - 8.6)	8 (7.5 - 8.8)	10 (8 - 12)
100-yr 24 hr. storm (in)	8.1	10.5 (8.9 - 12.4)	10.3 (9.0 - 11.9)	14 (10 - 16)
200-yr 24 hr. storm (in)	9	12 (10.1 - 14.7)	11.7 (9.8 - 13.6)	16 (11 - 19)
2-yr 6 hr. storm (in)	2.3	2.4 (±<0.1)	2.6 (2.6 - 2.7	3 (±<1)
15-yr 6 hr. storm (in)	3.6	4.6 (4.3 - 4.8)	4.7 (4.6 - 4.8)	5 (4 - 6)
100-yr 6 hr. storm (in)	5.1	6.7 (6.5 - 6.8)	6.5 (6.4 - 6.7)	9 (7 - 10)
200-yr 6 hr. storm (in)	5.6	7.5 (7.2 - 7.7)	7.2 (±<0.1)	10 (8 - 11)
80th Percentile storm (in)	0.8	0.9 (0.1)	0.9 (0.1)	0.95 (0.1-0.15)
90th Percentile storm (in)	1.14	1.24 (0.1)	1.24 – 1.34 (0.1-0.2)	1.24 – 1.39 (0.1-0.25)
95th Percentile storm (in)	1.5	1.6 – 1.65 (0.1-0.15)	1.6 – 1.75 (0.1-0.25)	1.75 – 1.85 (0.15-0.35)

Extreme Precipitation Events



Today's 100-year rain event (8 inches)

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SEA LEVEL RISE & STORM SURGE

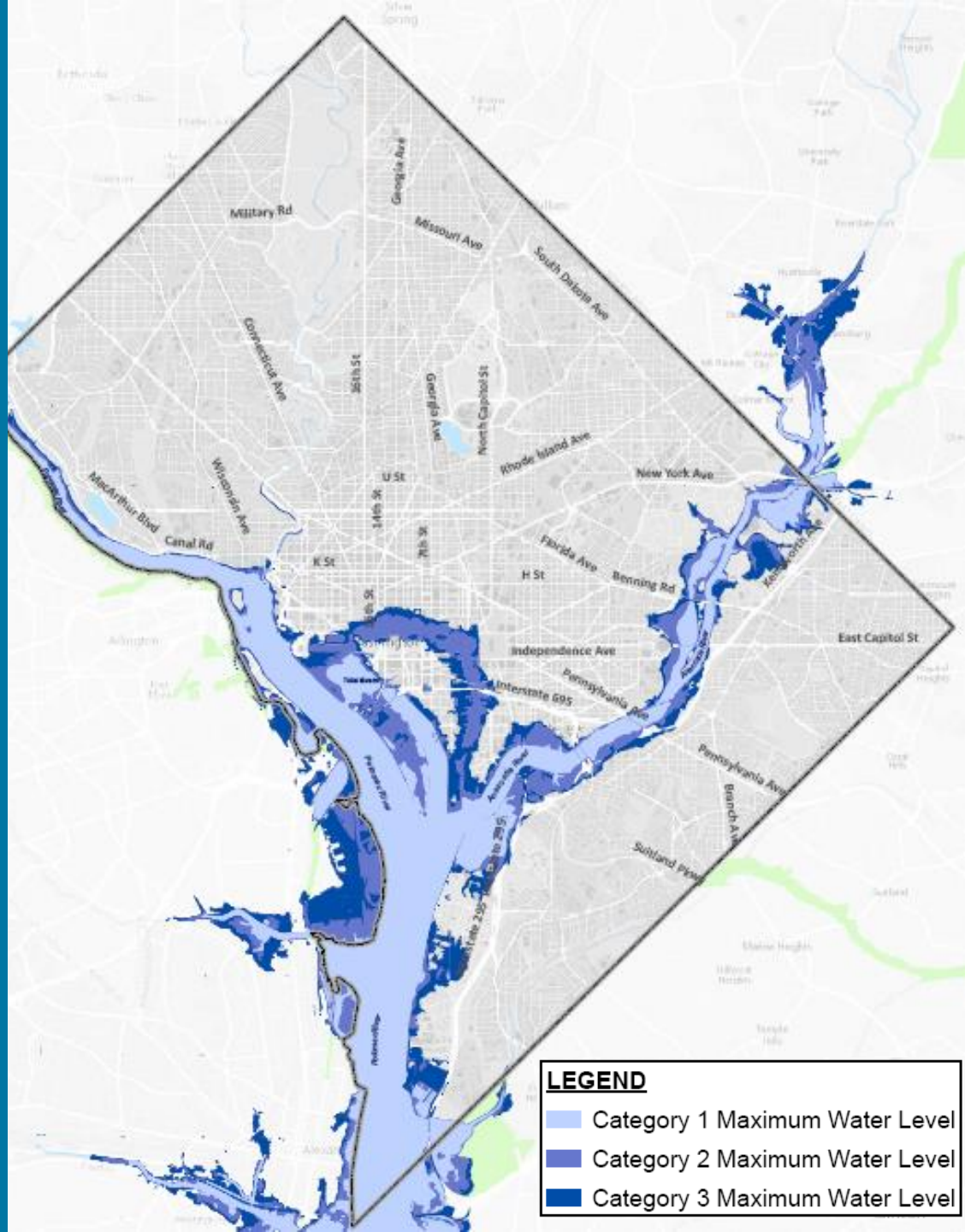
PROJECTED SEA LEVEL RISE

2020s: 2.4 inches

2050s: 1.4 feet

2080s: 3.4 feet

Source: USACE North Atlantic Coast Comprehensive Study map overlaid on GIS map base created by Kleinfelder, 2015.



QUESTIONS?

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