

Climate Change Considerations for MS4 Utilities

A District of Columbia Case Study

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Presentation Overview



- 1 DC's MS4 Program
- 2 Climate Drivers and Expected Impacts
- 3 Building a CC Resilient MS4 Program

DC's MS4 Program

31 square miles/48% of DC area

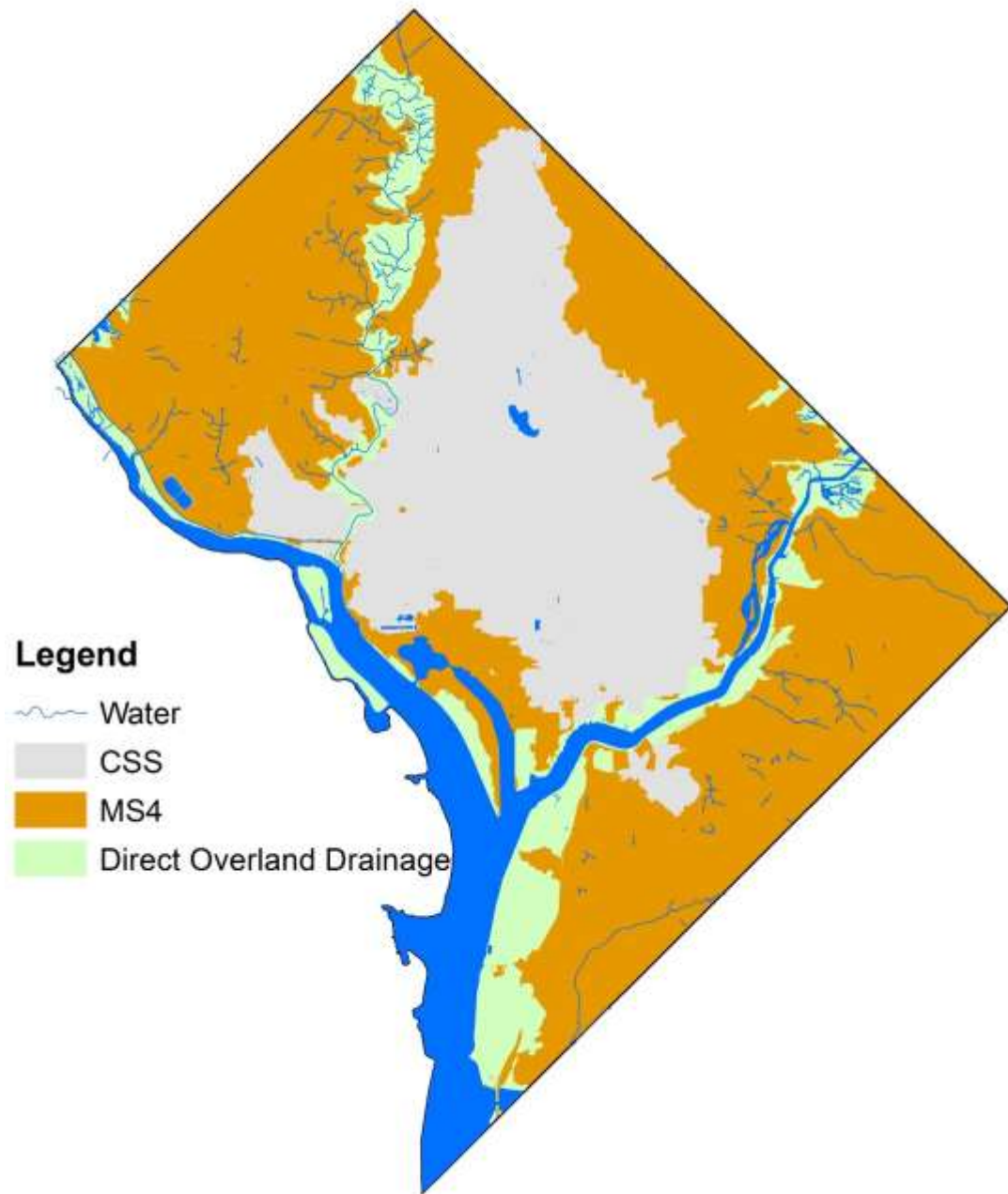
51% impervious

~100 miles of stream

28 TMDL studies, 439 MS4 WLAs

2016 & 2022 Consolidated TMDL
Implementation Plan

MS4 NPDES Permit includes
climate change elements,
aligns with “Climate Ready
DC” strategy

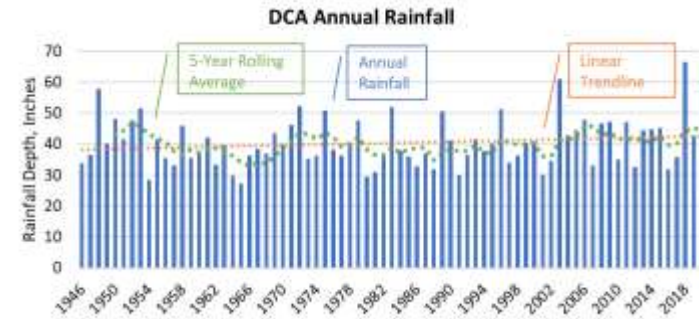


Climate Drivers and Expected Impacts

Precipitation



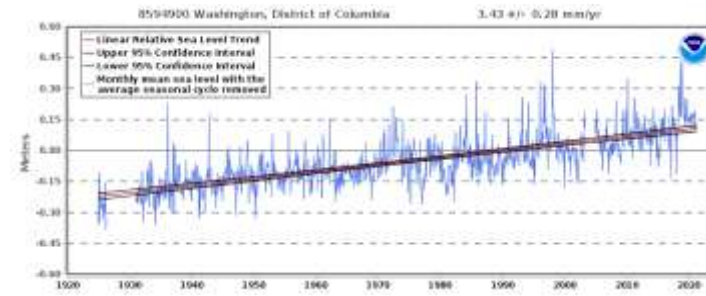
More annual rain (5-10% increase)
More intense rain events (25% increase)¹



Sea Level Rise



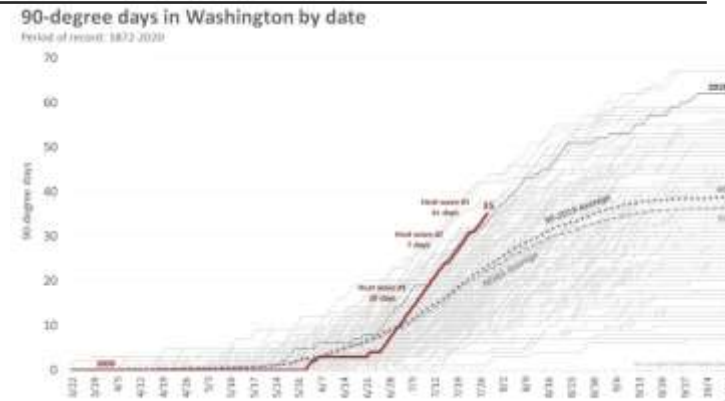
Sea level rise and higher tidal amplitude²



Temperature



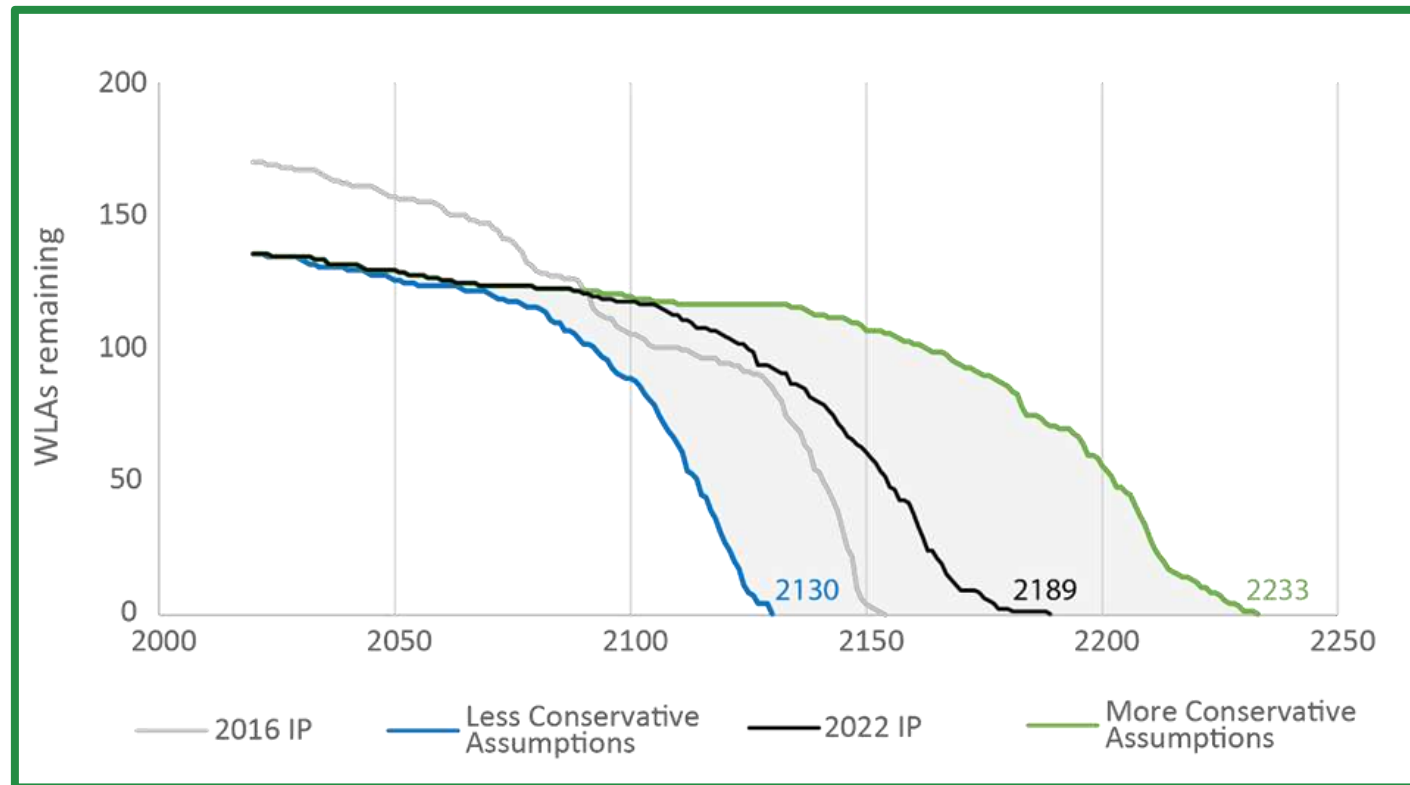
Warmer temperatures, more high heat index days, more frequent drought conditions³



1. <https://19january2017snapshot.epa.gov/sites/production/files/2016-11/documents/climate-change-dc.pdf>
2. https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8594900
3. <https://www.washingtonpost.com/weather/2020/07/27/washington-dc-july-record-heat/>

More Stormwater Pollution

- More load reduction needed to meet TMDL requirements (WLAs)
- May increase TMDL attainment timeline



https://dcstormwaterplan.org/wp-content/uploads/TMDL_IP_09132022_Final.pdf

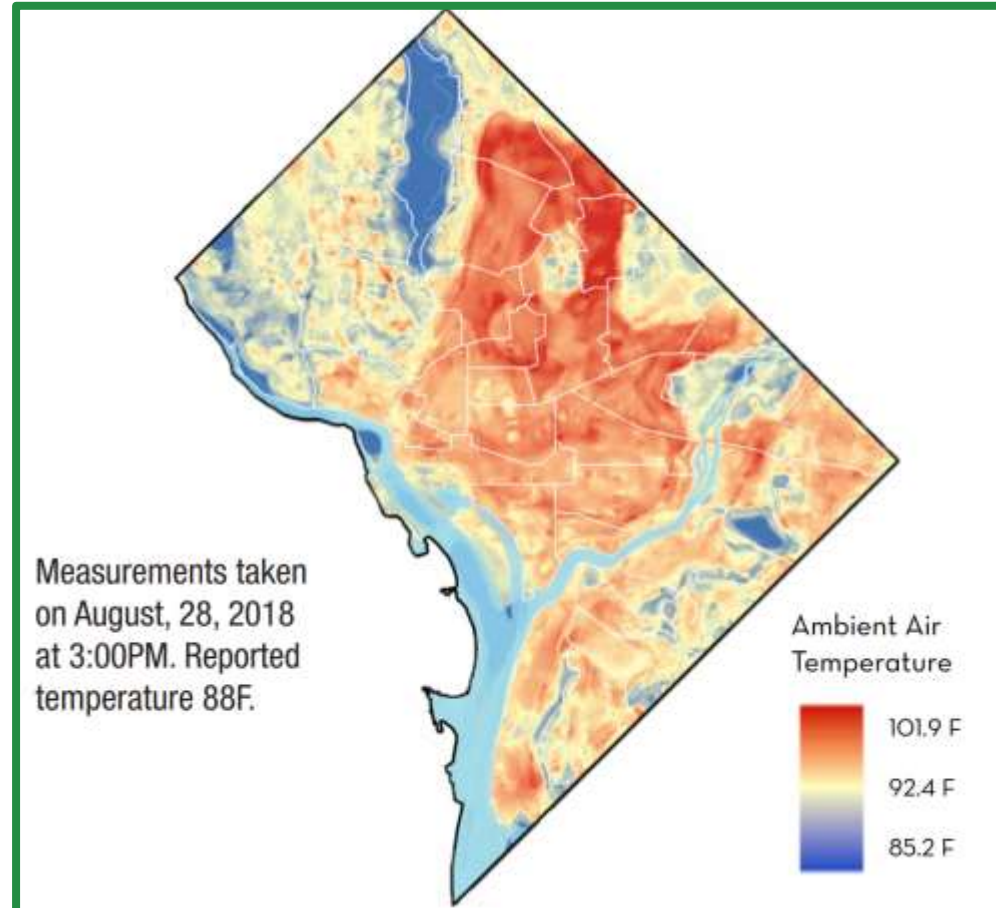
More Inland, Shoreline, Flash Flooding

- More in-stream erosion and pollutant loading
- Most existing stormwater and green infrastructure not designed for future precipitation and sea level rise trends
- May impact MS4 monitoring efforts and stream restoration efforts
- May impact meeting MS4 permit targets and WLA attainment timeline



More Extreme and Hostile Environment

- More stress, die-off of existing vegetation, including trees
- GI may fail or be less efficient than designed
- Potential increase in invasive species (e.g. emerald ash borer)
- May impact meeting MS4 permit targets (e.g.: tree canopy target) and WLA attainment timeline



Building Towards a More Resilient MS4 Program

Update
Stormwater
Design
Standards

Decision Support
Systems

Targeted
Investments

Partnership,
Outreach, and
Communication

Update Stormwater Design Standards

- Current Rainfall Design Standards for Stormwater Management:
 - Water Quality Treatment (GI design): retain 90th percentile storm (1.2”)
 - Water Quantity (Protect streams): detain 2-year, 24-hr storm (3.2”)
 - Water Quantity (Protect sewer infrastructure): detain 15-year, 24-hr storm (5.2”)
- CC projections predict significant increases in storm events and runoff
- DOEE is assessing changes to the design standards, in coordination with sister agencies (DC Water, DDOT and Mayor’s office) to develop broad-based design solutions that protect residents and are acceptable to regulated community.

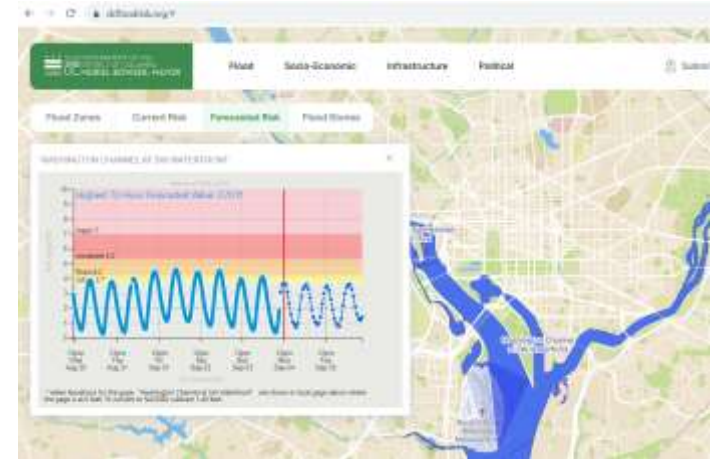
	2-year storm (inches)	15-year storm (inches)
MARISA Projections	3.2 → 3.6	5.2 → 6.1



<https://www.midatlanticrisa.org/about.html>

Incorporating CC in Decision Support Systems

- Assess and adapt monitoring programs for changing conditions
 - E.g.: Impact of increased temperature on MS4 and streams, fewer (or more difficult to predict) qualifying events for MS4 monitoring
- Integrated Flood Model (IFM):
 - 2-D flood models to assess problem areas, create updated flood maps, and target infrastructure investment in at-risk areas.
- Continued TMDL modeling of CC impacts on meeting MS4 WLAs.
 - E.g.: more/less conservative assumptions
- Staying current with technological advances
 - E.g.: GI Real Time Controls (dynamic operation)



Targeted GI/BMP Investments

- Leverage different funding sources
- Target environmental and social justice areas
 - DEIJ strategy for MS4 Area
- Prioritize high-efficiency GI whenever possible
- Adopt nature-based solutions that offer multiple co-benefits
- Promote pre- and post-construction monitoring to assess and understand multiple co-benefits

Funding Source	Funding Available for Investment in Pollution Controls
Enterprise Fund	\$3,650,000
Anacostia River Clean Up and Protection fund	\$1,000,000
Clean Water State Revolving Fund	\$3,100,000
Section 319 Grants	\$600,000
Ches. Bay Implementation Grants	\$1,200,000
Ches. Bay Regulatory and Accountability Program Grants	\$700,000
DDOT Tree Fund	\$650,000
Total:	\$10,900,000

Partnerships, Outreach, Communication



District Department of Transportation



Los eventos de lluvias intensas o

Flooding in the District E-Learning Series

The graphic shows three clouds with rain falling on a road. A car is on the road, and a blue wave is below it. The text "Los eventos de lluvias intensas o" is written below the car. Below the graphic is the text "Flooding in the District E-Learning Series".

Thank you

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2023 Potomac River Conference: One River's Perspective on a Changing Climate
September 21, 2023 Lorton, VA



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