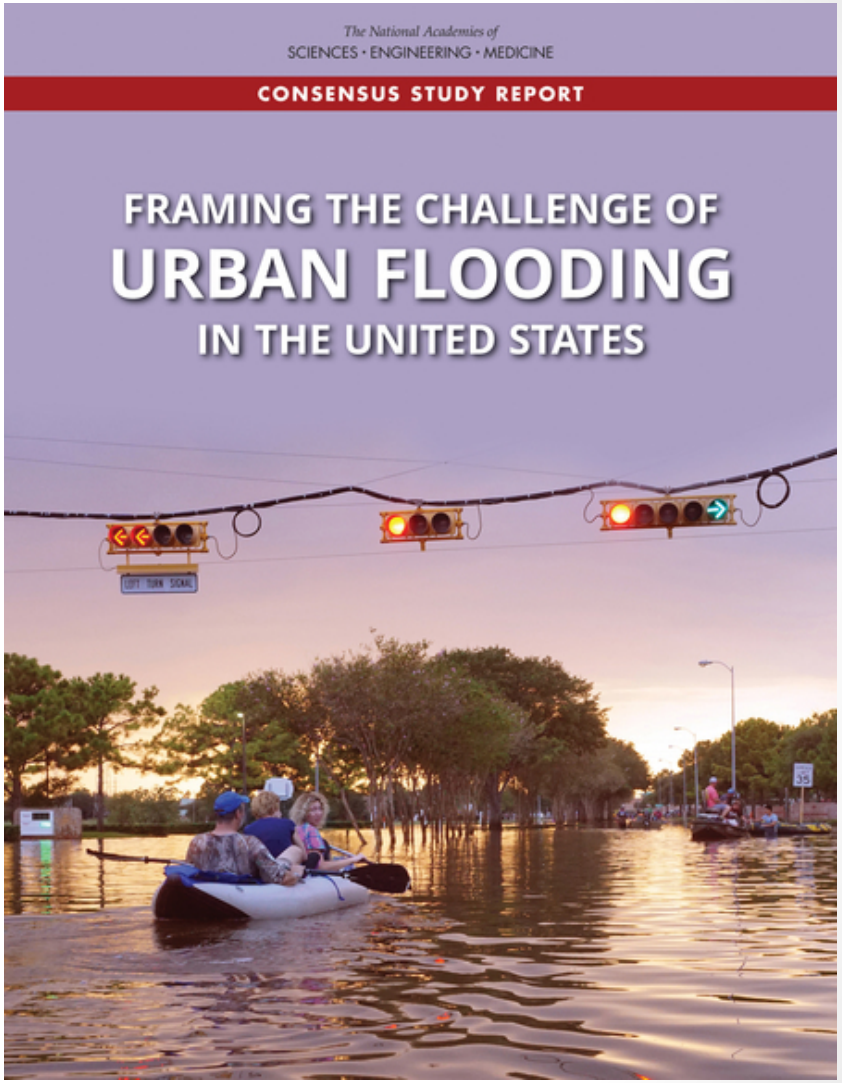
Urban Flooding and Resilience

June 21, 2019

MCD

MIAMI CONSERVANCY DISTRICT

Urban flooding is the accumulation of floodwaters that result when the inflow of storm water exceeds the capacity of a drainage system to infiltrate water into the soil or to carry it away.



Traditional Flood Categorizations

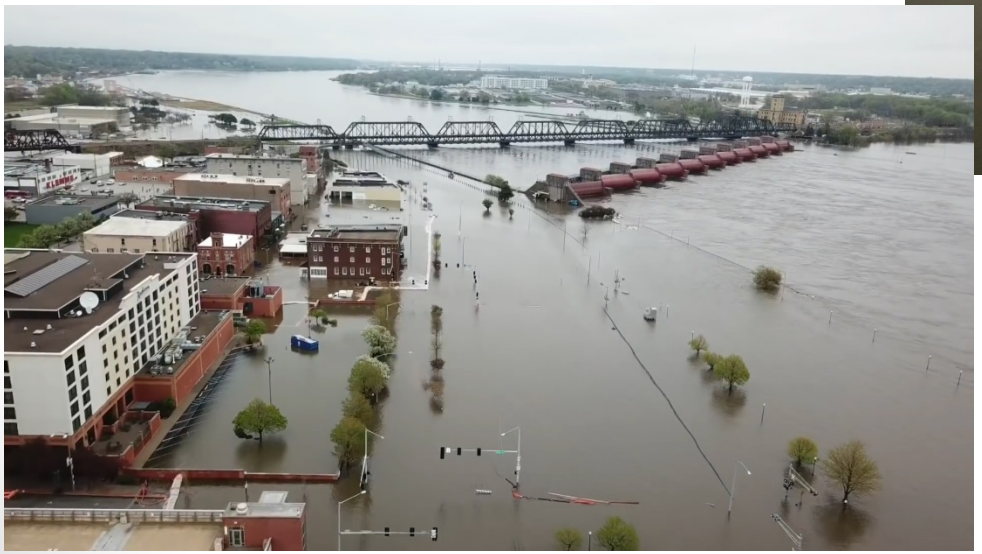
Coastal

- Hurricanes
- High winds
- Intense rainfall
- Storm surges
- Tidal action

Traditional Flood Categorizations

Riverine

- Overflow of rivers and tributaries
- Watershed scale



Urban Flooding

"Rainfall" flooding

- Localized small scale
- Intense rainfall
- Often called "flash flooding" or "pop-up storms"

No place for water to go

- Impervious areas – streets, parking lots, rooftops
- Inadequate drainage infrastructure

Why Differentiate?

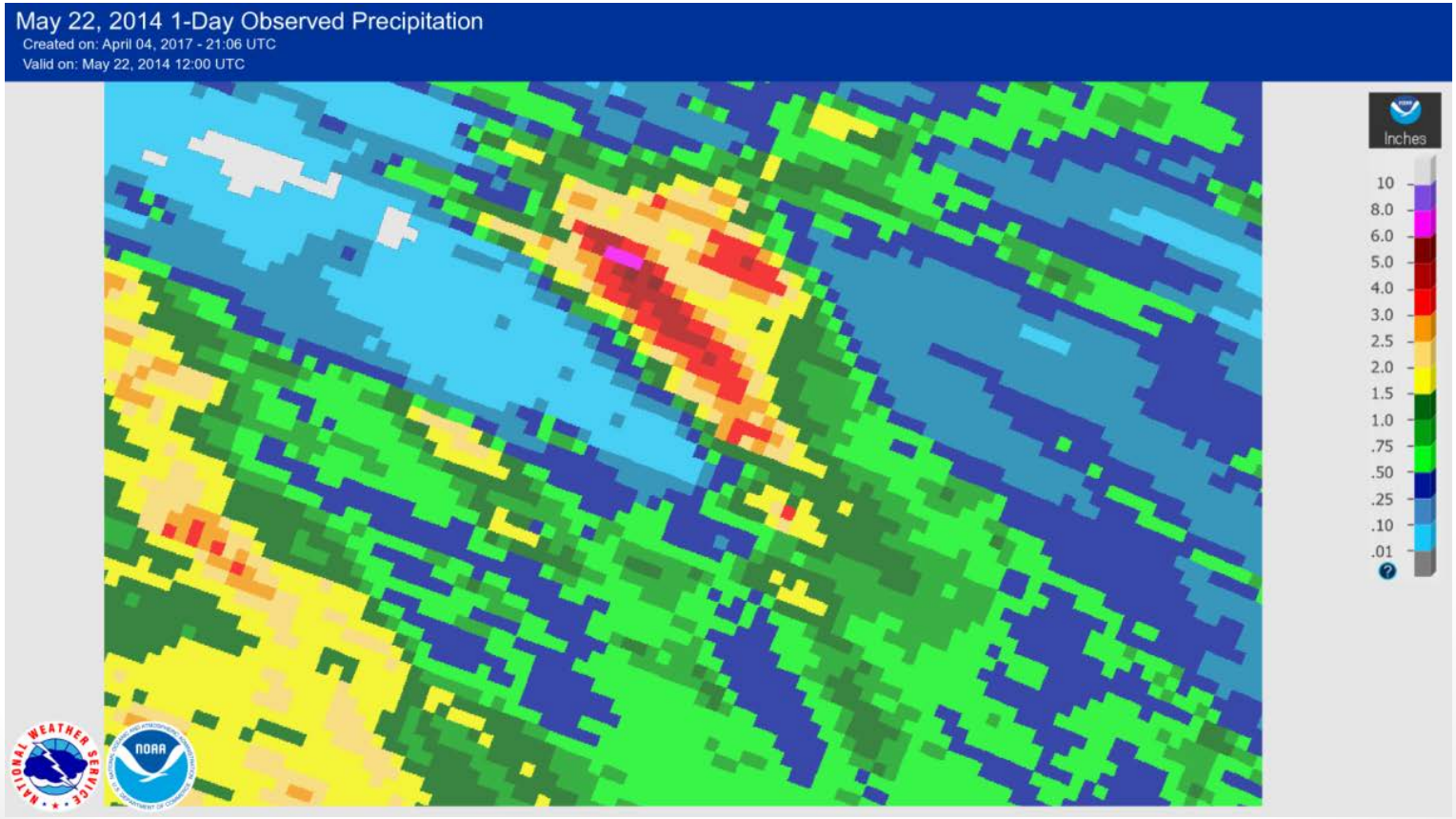
- Scale
- Timing
- Analyzing risk
- Flood risk reduction

Scale

- Riverine – watershed event

Scale

- Urban - localized event



Scale

- May 22, 2014

Timing

- Riverine – measured in days

Timing

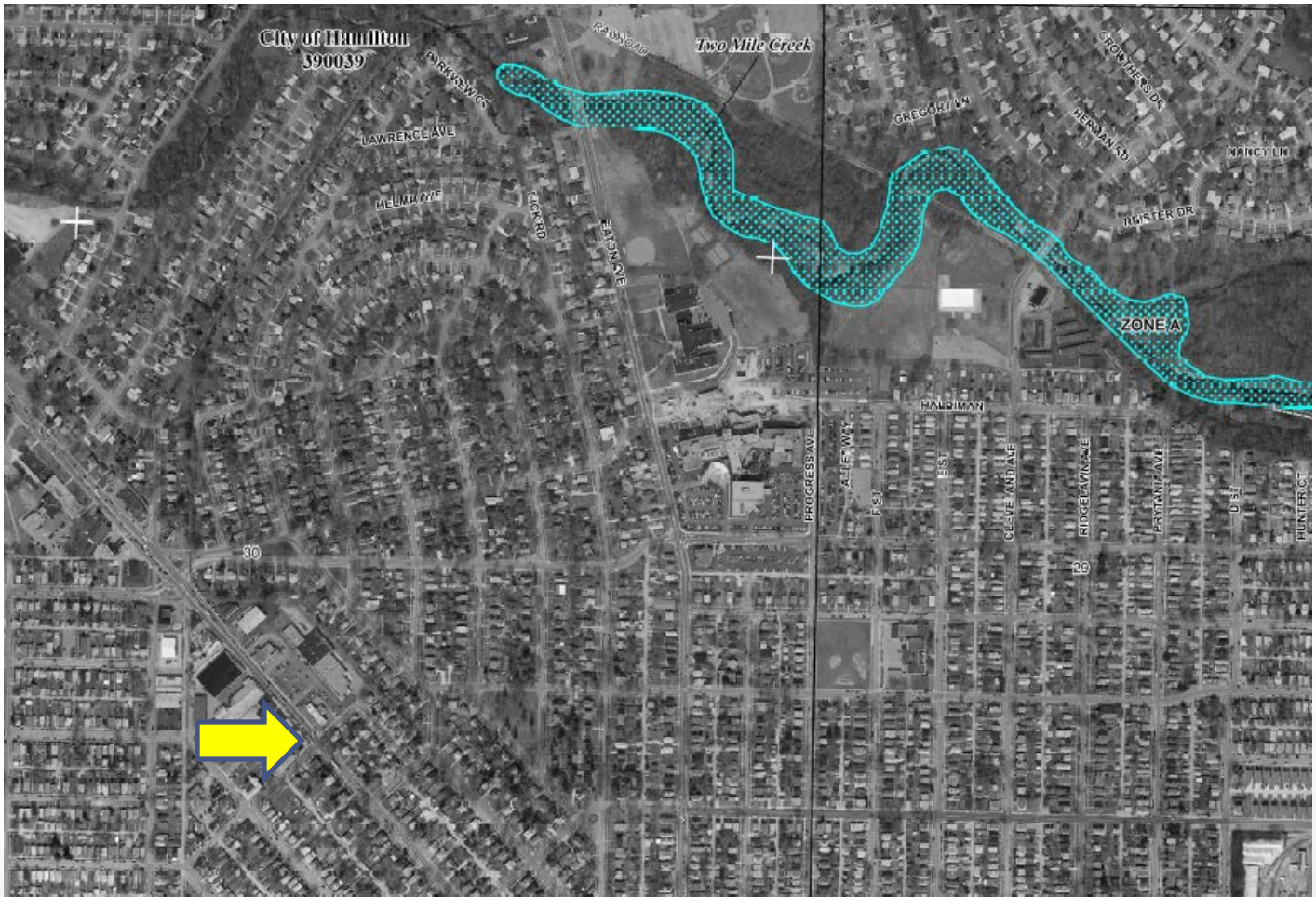
- Urban – measured in hours, sometimes minutes

Analyzing Risk

FEMA Maps – riverine flooding

Analyzing Risk

FEMA Maps – riverine flooding



Analyzing Risk

June 2, 2016

Analyzing Risk

June 2, 2016

Flood Risk Reduction

Structural

- Dams and retarding basins
- Levees
- Floodwalls
- Pump stations
- Channels
- Clearing debris
- Bridge enlargements

Non-structural

- Land use policies
- Building codes & inspection
- Regulations & mapping
- Community awareness
- Evacuation planning
- Emergency management
- Road closings
- Flood warning
- Beneficial use of preserved floodplain
- Community awareness
- Buyouts and relocations
- Emergency planning

Flood Risk Reduction

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Community partners

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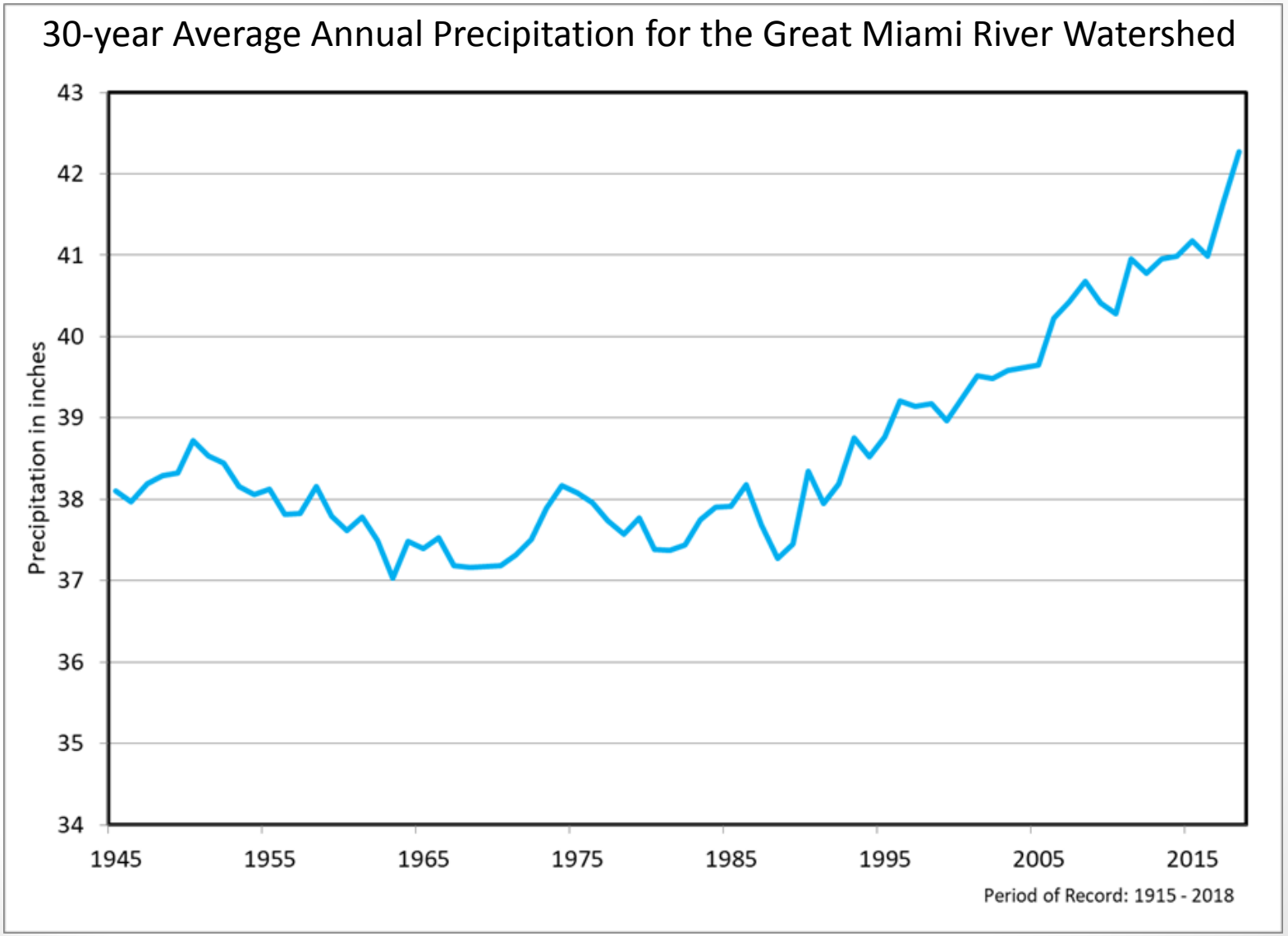
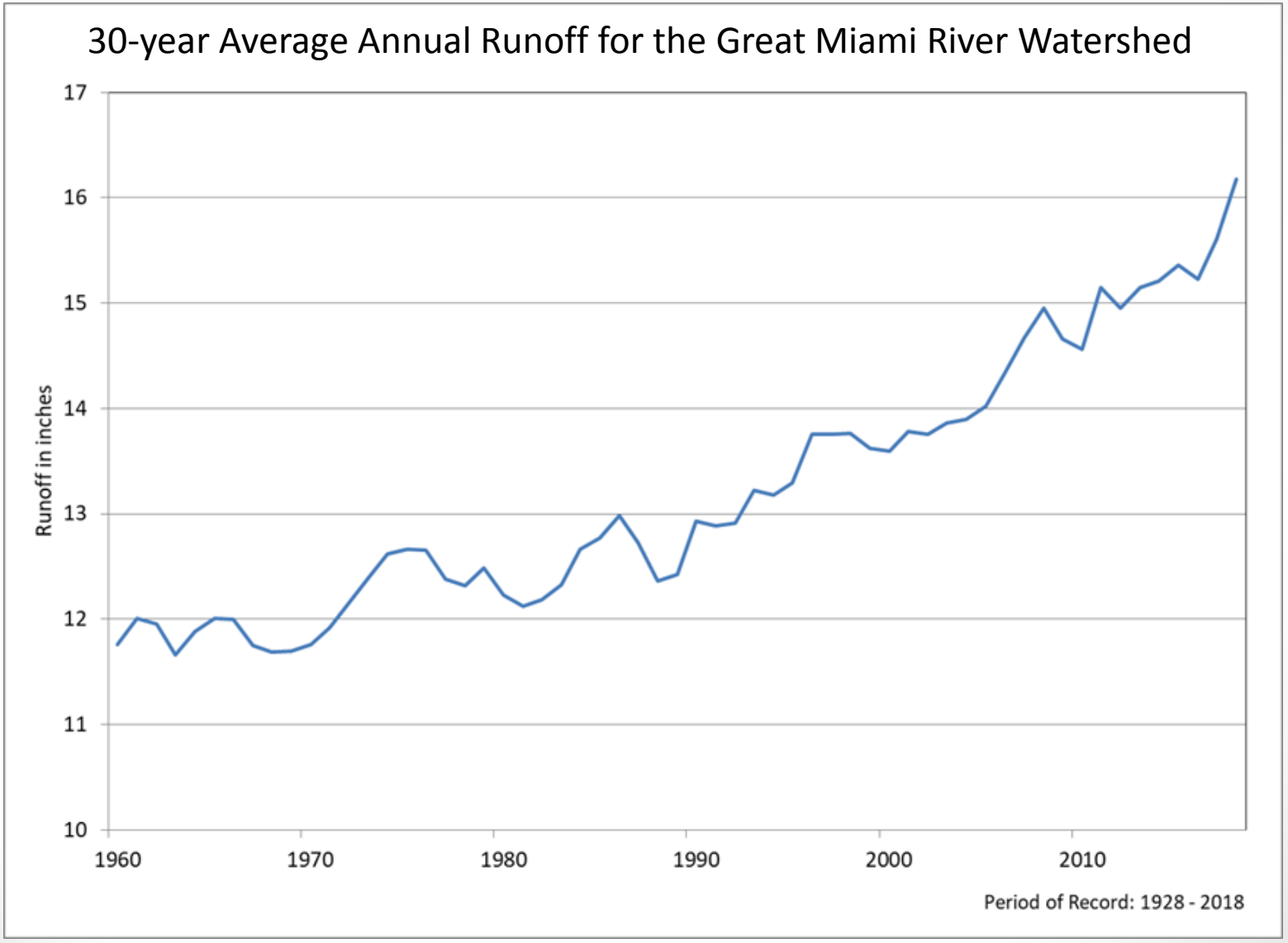
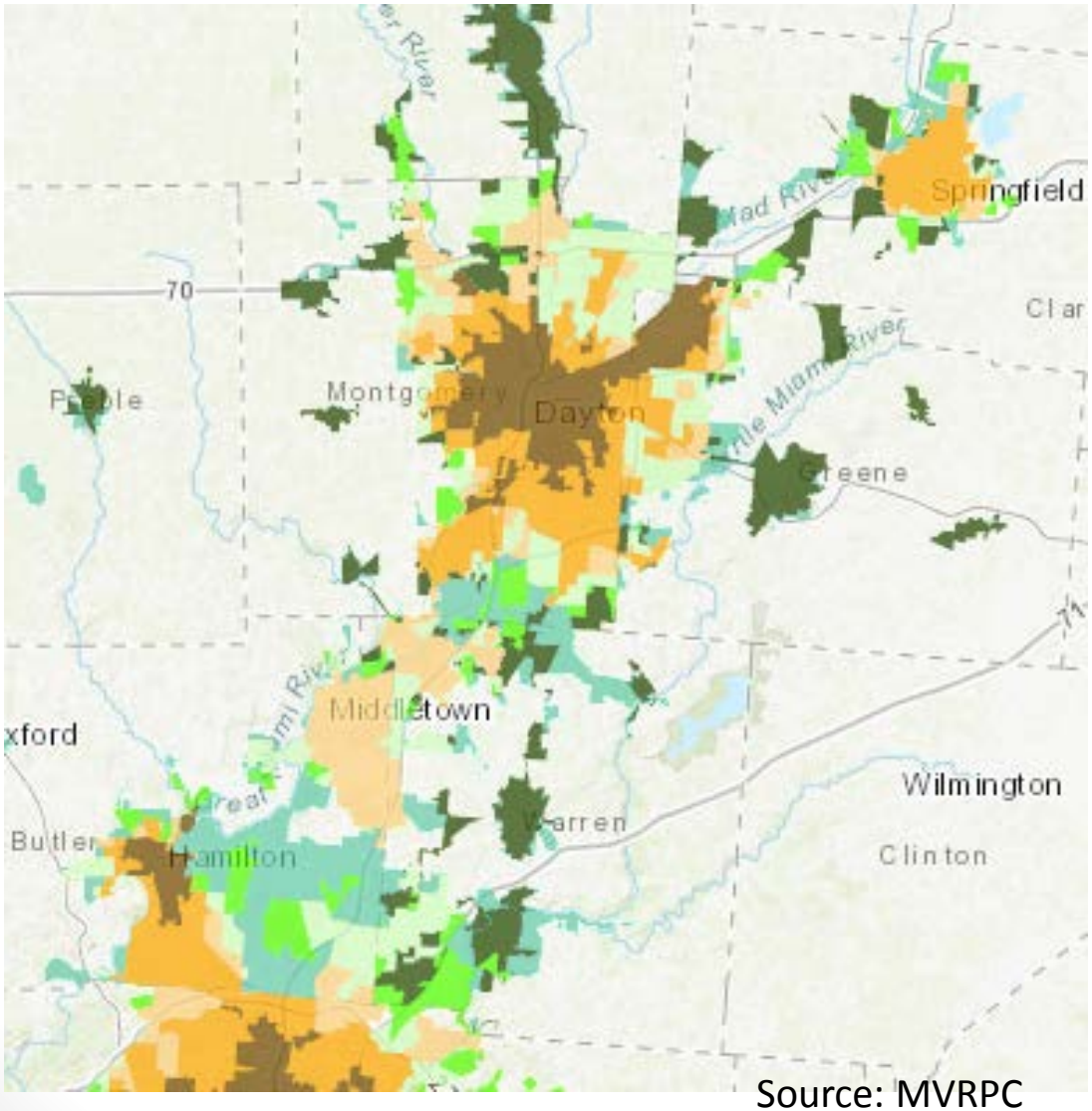
Precipitation



Runoff


30-year Average Annual Runoff for the Great Miami River Watershed
Runoff in inches
17
16
15
14
13
12
11
10
1960
1970
1980
1990
2000
2010
Period of Record: 1928 - 2018

Urbanization



Source: MVRPC

Drainage Infrastructure

- Outdated
- Undersized
- Ageing
- Drainage patterns

Stormwater Management

- MS4
- Phase 1
- Phase 2

- Water quality
- Remove pollutants from storm runoff
  - Sediment
  - Nutrients / fertilizer
  - Chemicals
  - Oil

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Urban flooding is a quantity problem, not a quality problem

Thank you!

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