



# Changes in the Water Cycle and the Effects on the Landscape of the Miami Valley Region

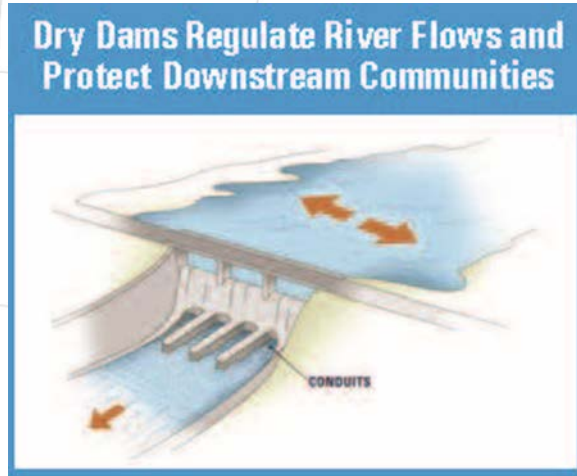
MVRPC Technical Advisory Committee Meeting  
Fitz Center 1401 S. Main Street, Suite 230, Dayton, OH  
Mike Ekberg, Miami Conservancy District  
August 17, 2023

PROTECTING. PRESERVING. PROMOTING.



# MCD Integrated System

- 5 dry dams
- 55 miles of levees and floodwalls
- 185 floodgates
- 10,000 acres of natural floodplains
- 35,000 acres of land that store water
- Improved channels in cities
- 101 Years Old, in need of rehab



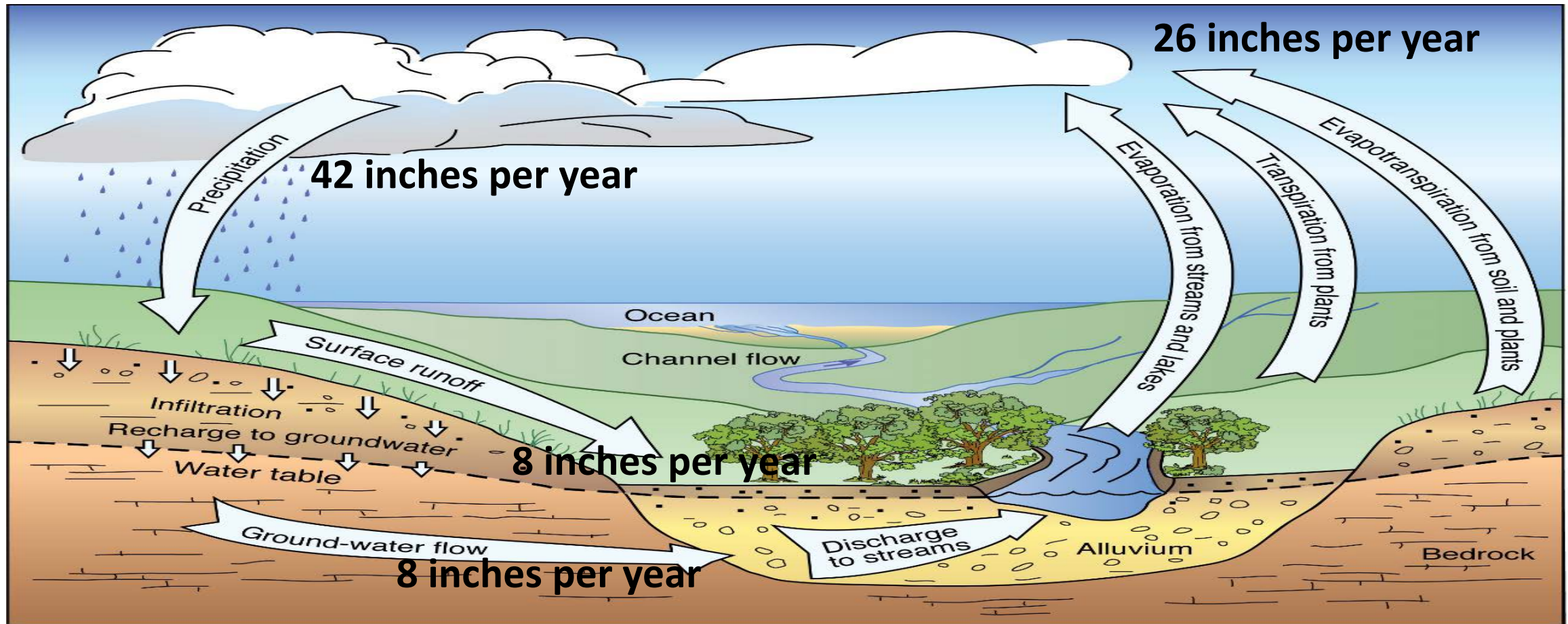


# Collect water data

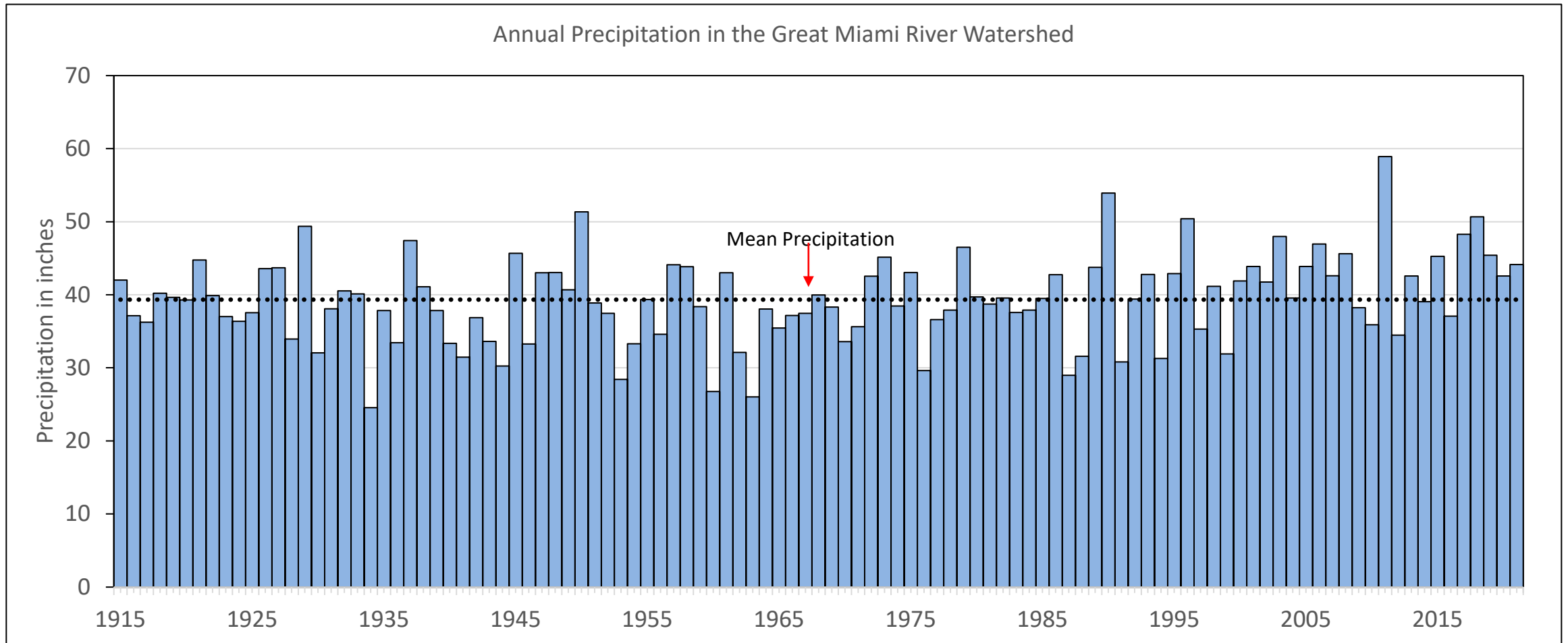




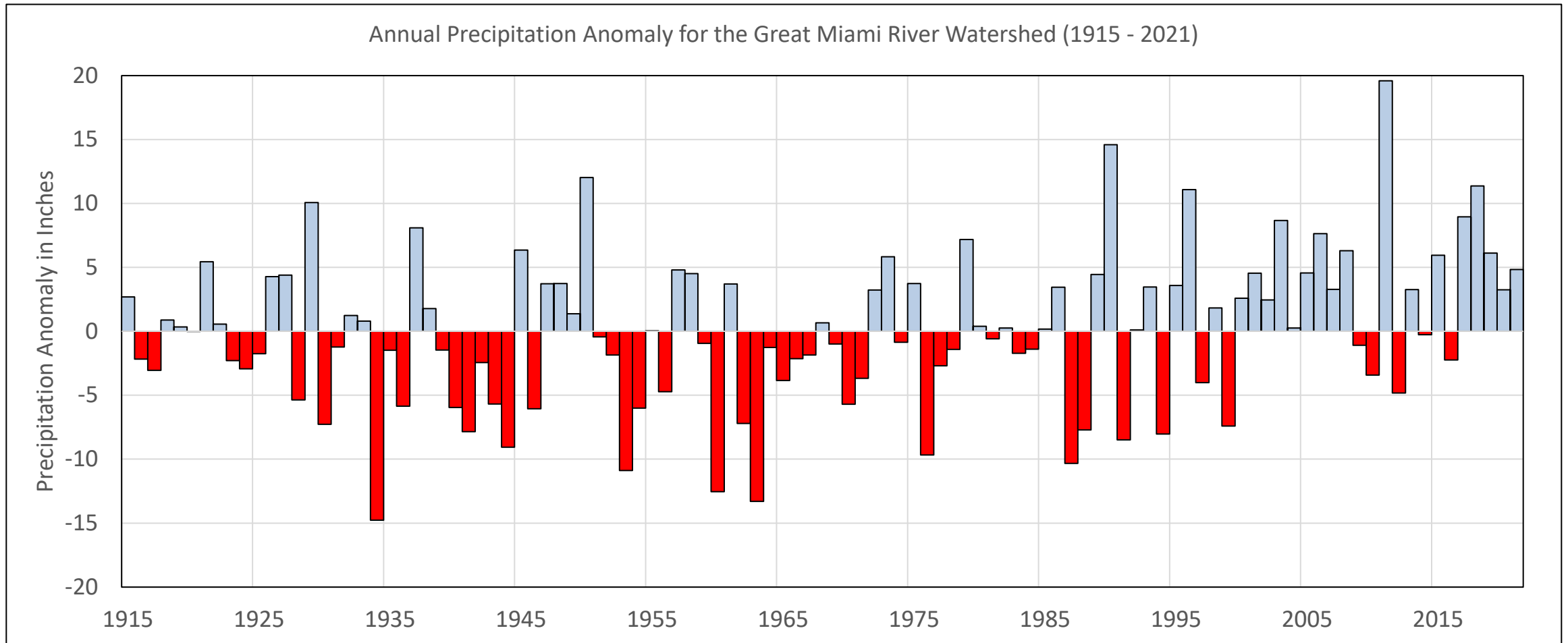
# Water Cycle



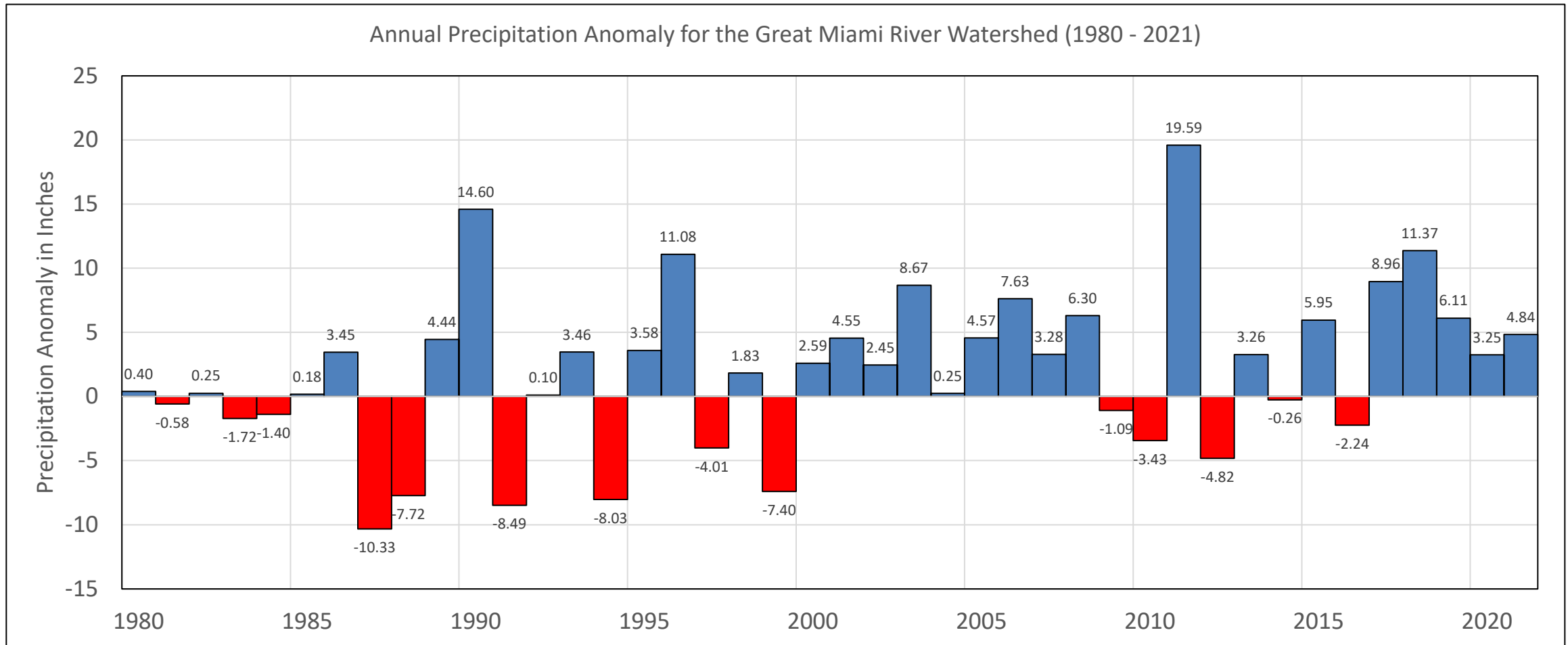
# Assess the trends



# Assess the trends

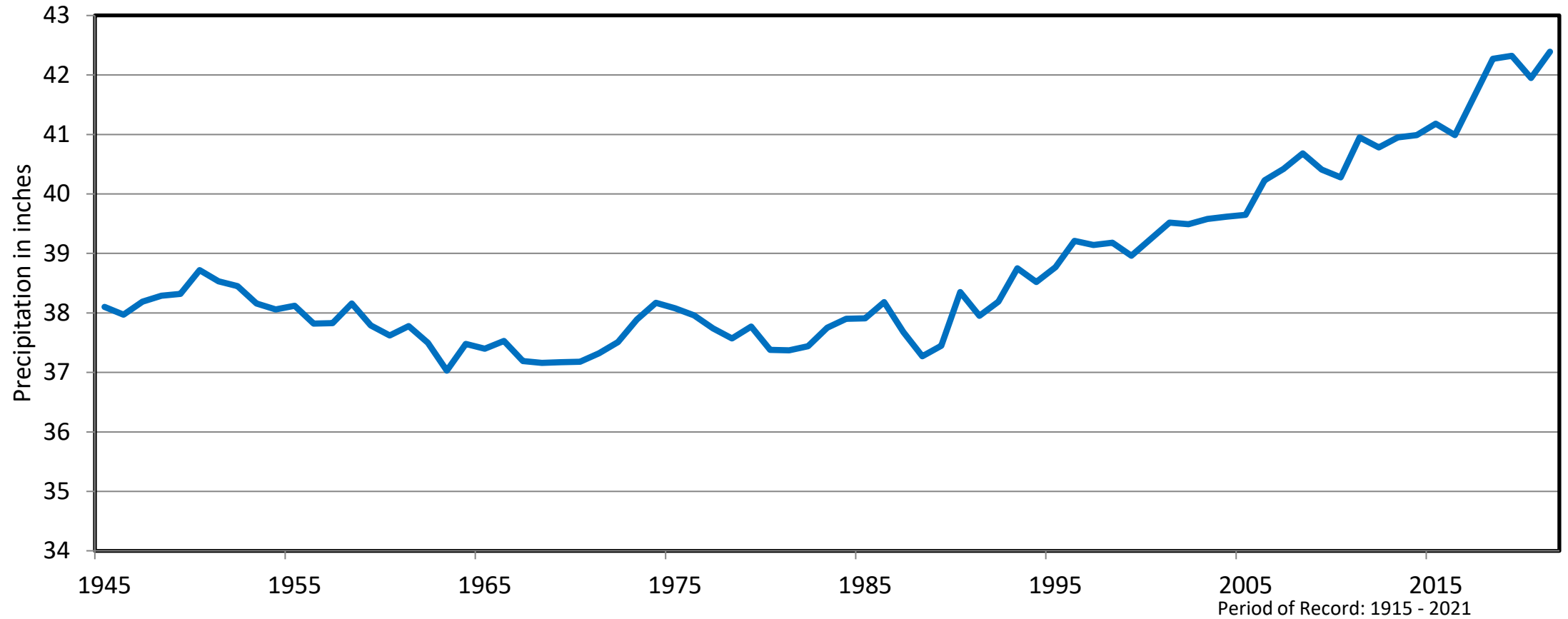


# Assess the trends



# Assess the trends

Moving 30-Year Mean Annual Precipitation for the Great Miami River Watershed



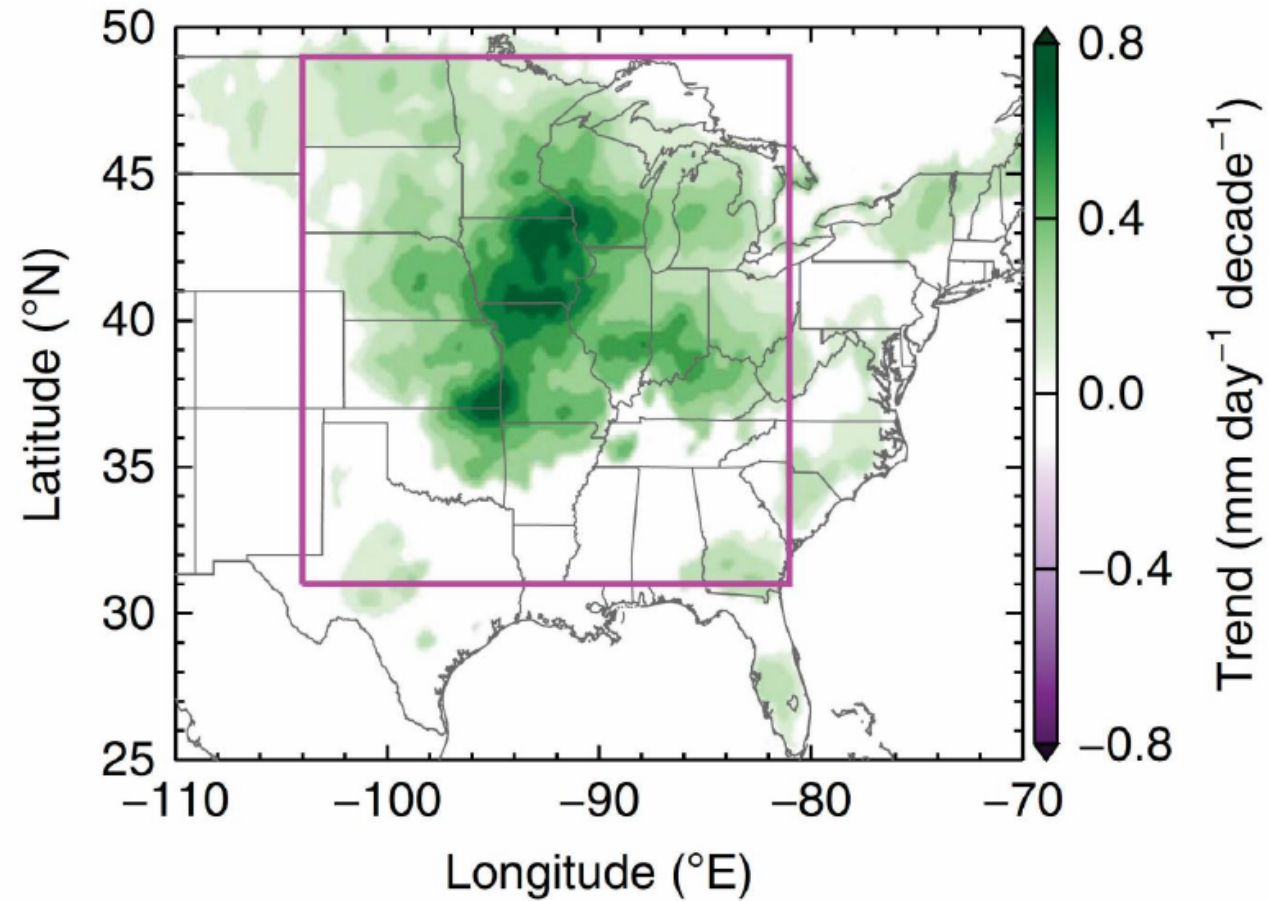


# Assess the trends

## Upward Trends in 24 hour Duration Precipitation

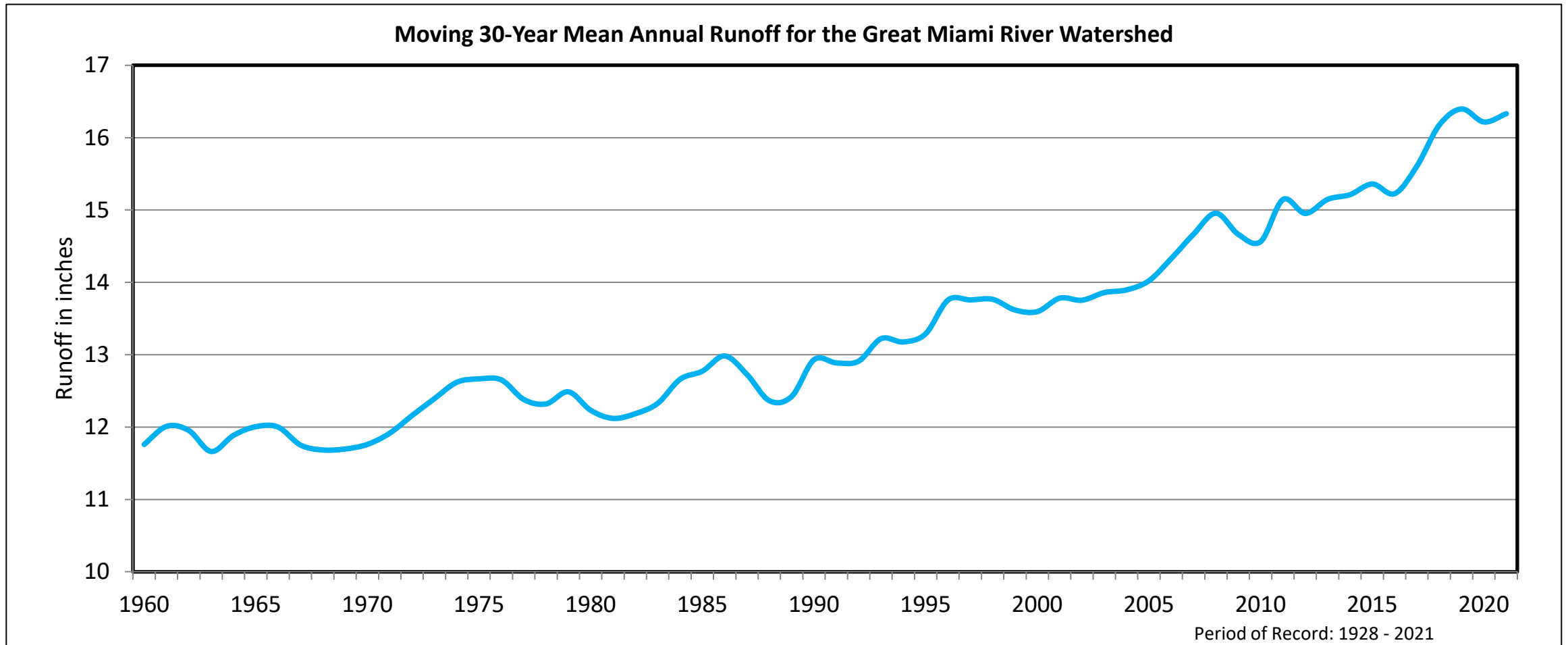
	P > 0	P ≥ 1	1yr	2yr	5yr
Dayton	No	Yes	No	No	No
Greenville	Yes	No	Yes	No	No
Middletown	No	Yes	No	No	No
New Carlisle	Yes	Yes	No	No	No
Piqua	Yes	Yes	Yes	Yes	No
Sidney	Yes	Yes	No	No	Yes
Springfield	No	Yes	No	No	No
Urbana	Yes	Yes	Yes	Yes	Yes
Vandalia	No	Yes	Yes	No	No

# Assess the trends



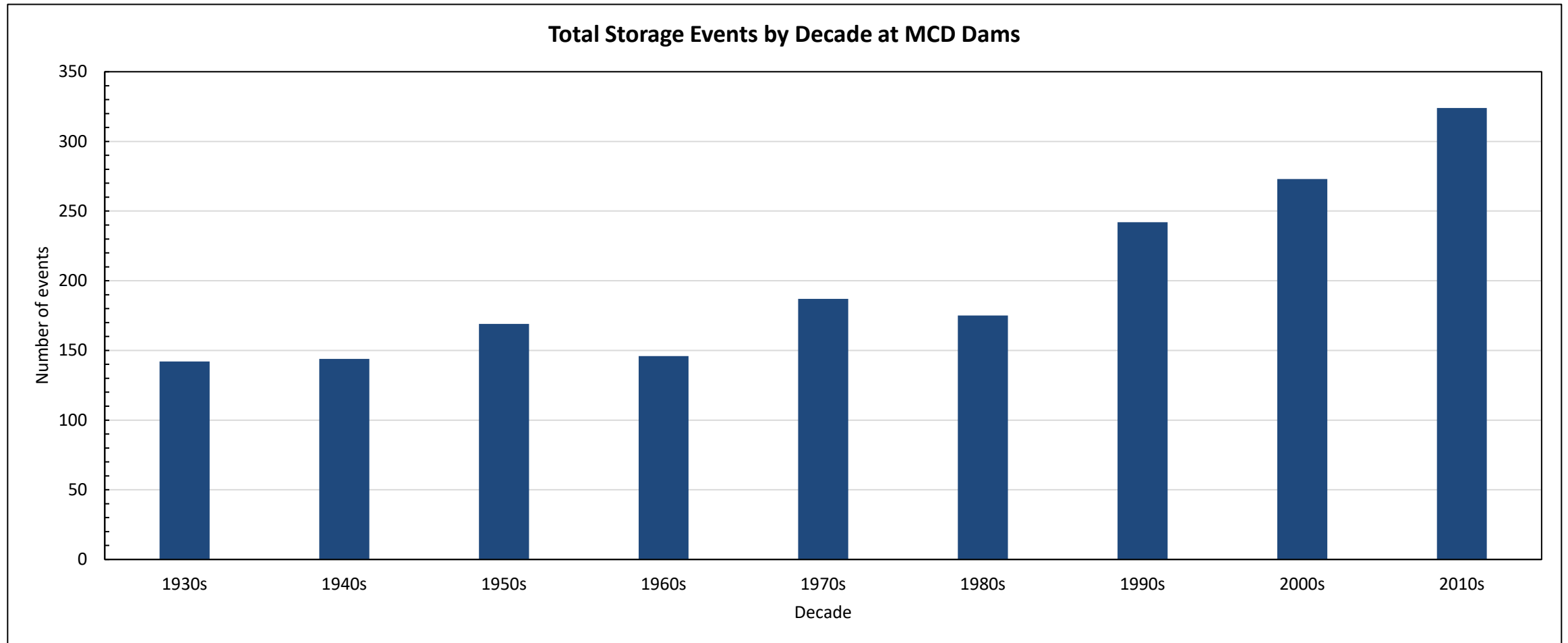
**Figure 2.** Trends in mesoscale convective system intensity from April-June from 1979-2014. Adapted from Feng et al., 2016.

# Assess the trends

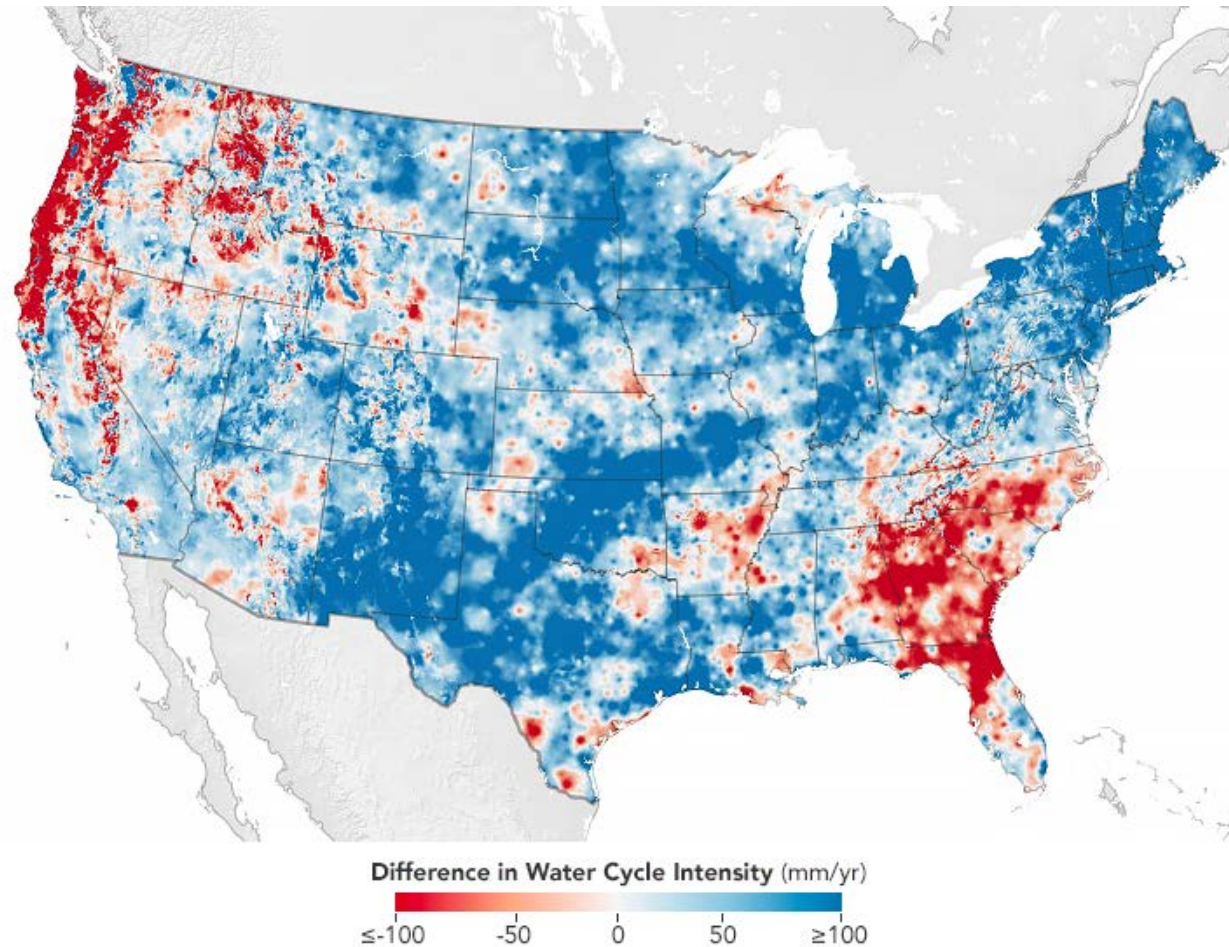




# Storage Events at MCD Dams



# Water Cycle is Speeding Up



<https://earthobservatory.nasa.gov/images/145357/water-cycle-is-speeding-up-over-much-of-the-us>

# More Flooding





# More Streambank Erosion





# Adaptation



[https://www.hammontree-engineers.com/about/projects/Allenford-Drive-S.E.-Stream-Bank-Restoration-and-Sewer-Repair\\_AE44.html](https://www.hammontree-engineers.com/about/projects/Allenford-Drive-S.E.-Stream-Bank-Restoration-and-Sewer-Repair_AE44.html)

# Stream Setbacks

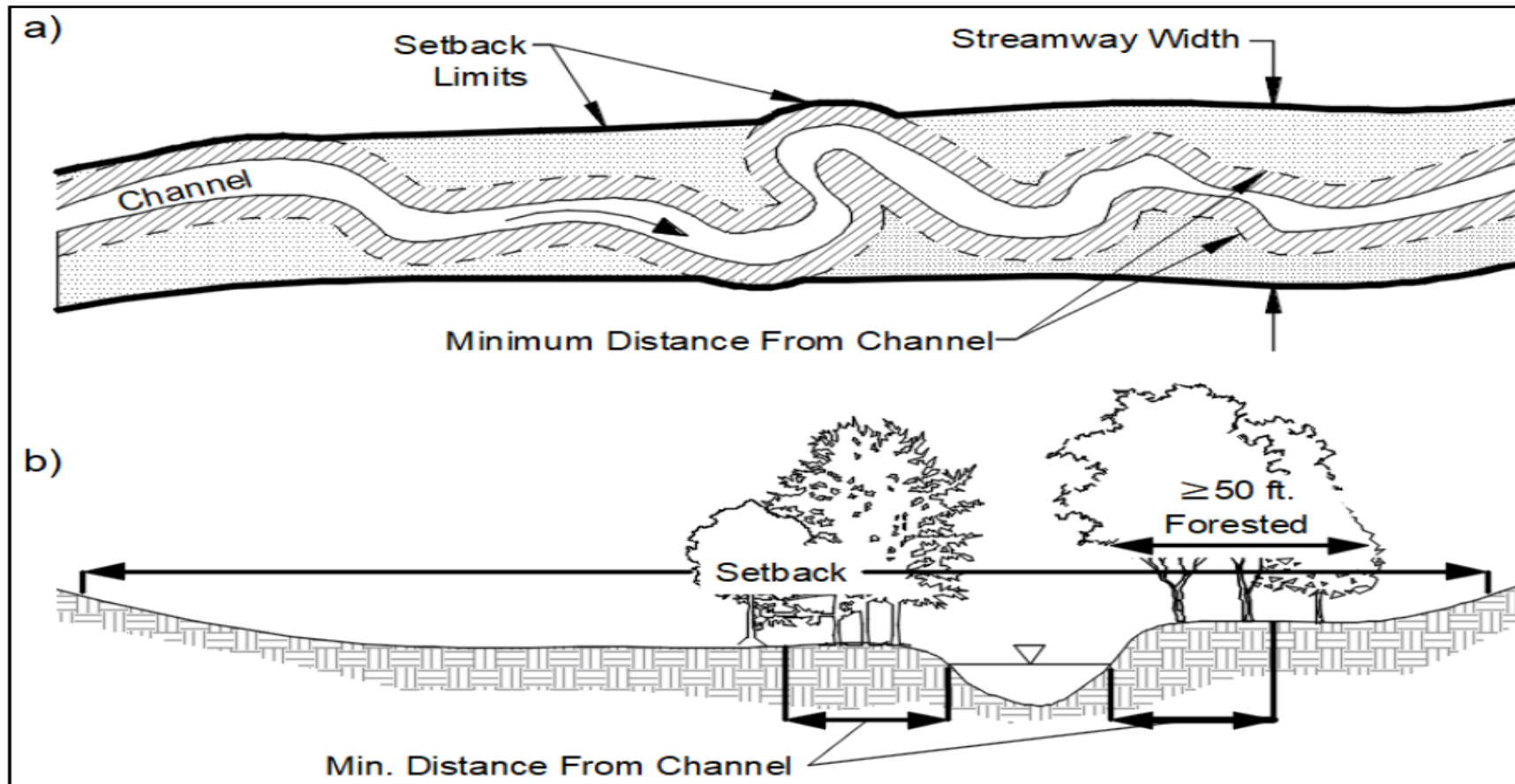


Figure 1.5.2 Illustration of a stream setback in a) plan view and b) section view (not to scale).

Credit: Ohio EPA



# MCD's Vision

Thriving communities, a healthy watershed,  
and a higher quality of life – sustained by  
well-managed water resources throughout  
the watershed.

