Climatic Trends in the Water Cycle for the Miami Valley Region

MVRPC Climate Change Seminar
Dayton Board of Realtors, Dayton, OH
Second Floor Conference Center
Mike Ekberg, Miami Conservancy District
February 24, 2020
Miami Valley
Water Budget

INFLOWS = OUTFLOWS ± ∆STORAGE
Water Cycle

42 inches per year

26 inches per year

8 inches per year

8 inches per year
Collect water data
Assess the trends

Annual Precipitation in the Great Miami River Watershed

Precipitation in inches

Mean Precipitation

Assess the trends

Annual Precipitation Anomaly for the Great Miami River Watershed (1915 - 2019)
Assess the trends
Assess the trends

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

Period of Record: 1915 - 2018
Assess the trends
Assess the trends

Annual Runoff Anomaly for the Great Miami River Watershed (1915 - 2019)
Assess the trends

Annual Runoff Anomaly for the Great Miami River Watershed (1915 - 2019)
Assess the trends
Assess the trends

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

- 30-yr Moving Mean Base Flow Runoff
- 30-yr Moving Mean Surface Runoff

Period of Record: 1928 - 2017
Assess the trends

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

Precipitation Period of Record: 1915 - 2019

Evapotranspiration (ET)
Assess the trends

Estimated Evapotranspiration for the Great Miami River Watershed

Evapotranspiration in Inches

Mean ET

Evapotranspiration in Inches

Assess the trends

Estimated Evapotranspiration Anomaly for the Great Miami River Watershed (1928 - 2019)
Assess the trends

Assess the trends

Moving 30-Year Mean Evapotranspiration for the Great Miami River Watershed

Period of Record: 1915 - 2019
Assess the trends

Trenton Area

West Carrollton and Moraine Area
Assess the trends

### Kendall’s tau Correlation Test

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Tau correlation</th>
<th>S</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitation (1915 – 2018)</td>
<td>0.140</td>
<td>74</td>
<td>2.101</td>
<td>0.0356</td>
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<tr>
<td>Precipitation (1980 – 2018)</td>
<td>0.224</td>
<td>166</td>
<td>1.996</td>
<td>0.0459</td>
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<tr>
<td>Runoff (1928 – 2018)</td>
<td>0.249</td>
<td>1021</td>
<td>3.497</td>
<td>0.0005</td>
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<td>Runoff (1980 – 2018)</td>
<td>0.232</td>
<td>172</td>
<td>2.069</td>
<td>0.0386</td>
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</tbody>
</table>
Assess the trends
Assess the trends

Great Miami River at Hamilton OH
Season Consisting of Aug Sep Oct

Great Miami River at Hamilton OH
Water Year

Protection. Preserving. Promoting. | April 6, 2019
Assess the trends

Top 100 Storage Events by Decade
Water Cycle Intensifying
Water Cycle Intensifying
MCD’s Vision

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