

Technical Memorandum

To: John Loomis, South Washington Watershed District
From: Barr Engineering Co.
Subject: SWWD P8 Precipitation and Temperature File Source Data
Date: November 6, 2023
Project: SWWD Standards Guidance Manual Updates

The P8 urban catchment model requires hourly precipitation and daily temperature files to estimate the generation and transport of stormwater runoff and pollutants. The precipitation file "MSP_19700101-20001231.pcp" and temperature file "MSP_19700101-20001231.tem" were created for use by project developers applying for stormwater permits for sites located within the South Washington Watershed District. To be consistent with the date range used to define stormwater best management practice (BMP) performance standards for the Minnesota Pollution Control Agency's Minimal Impact Design Standards (MIDS) Calculator, project applicants must submit P8 models with a simulation date range from 1/1/1971 through 12/31/2000.

The "MSP_19700101-20001231.pcp" precipitation file was created from precipitation data collected at the Minneapolis-Saint Paul International Airport (MSP) weather station.

Between January 1970 to June 1996, hourly precipitation data recorded at the MSP airport was obtained from the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) website (1). The NOAA website has MSP precipitation data for both hourly and daily timesteps from 1948 to 2014. Between January 1970 to June 1996, the summed hourly totals (for each day) from the NOAA website match the daily totals reported on both the NOAA (1) and the Minnesota Department of Natural Resources (MnDNR) (2) websites. After June 1996, the summed hourly totals (for each day) from the NOAA website are less than the daily totals listed on the NOAA and MnDNR websites.

After June 1, 1996, hourly precipitation data recorded at the MSP airport was obtained from the Iowa State University Iowa Environmental Mesonet website (3) as directed by the Minnesota State Climatology Office (4). The summed hourly totals (for each day) for this period from the Iowa State University website also are slightly less than the daily totals listed on the NOAA and MnDNR websites. To account for the differences between hourly and daily totals, a correction factor was applied to the hourly data such that the hourly totals match the respective daily total listed on the NOAA and MnDNR websites.

The 10-inch July 1987 superstorm was removed from the standardized precipitation file because this event significantly affects the average annual pollutant and runoff results. This is consistent with the precipitation data used to develop the MIDS BMP performance standards. Removal of this event was completed by removing all hourly rainfall data from 7/23/1987 through 7/24/1987 in the precipitation file.

Daily temperature data was also obtained from the Minneapolis-Saint Paul International Airport weather station. Between January 1970 to June 1996, temperature data was obtained from the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) website (1). From June 1, 1996 through December 31, 2000, temperature data was obtained from the Iowa State University Iowa Environmental Mesonet website (3).

References

1. NOAA daily and hourly precipitation data from 1/1/1970 through 5/31/1996:
<https://www.ncdc.noaa.gov/cdo-web/datasets>.
2. MnDNR daily precipitation data from 1/1/1970 through 12/31/2000:
[Retrieve Climate Data from National Weather Service Reporting Stations | Minnesota DNR \(state.mn.us\)](#)
3. Iowa State University hourly precipitation data from 6/1/1996 through 12/31/2000:
http://mesonet.agron.iastate.edu/request/download.phtml?network=MN_ASOS
4. Minnesota State Climatology Office website:
[Past Climate Data for Minnesota | Minnesota DNR \(state.mn.us\)](#)