

Q. I'm constructing a WDM file from scratch. What are the minimum data requirements?

A. See the following table for the matrix of weather data time series required for each HSPF module.

L2-10

METEOROLOGIC TIME SERIES DATA REQUIREMENTS FOR HSPF

	PERLND/IMPLND						RCHRES				
	Temp.	Snow	Water	Sediment	Soil Temp.	Ag. Chem.*	Water	Heat	Gen. Qual.	DO	Plankton
Precipitation	●	●	●	●		● [1]	▲	▲			
Pot. ET			●	● [1]		● [1]	▲				
Air Temperature	●	●			●	● [2]		●			
Wind Speed		●						●	● [3]	● [5]	
Solar Radiation		●						●			●
Dewpoint Temp.		●						●			
Cloud Cover								●	● [4]		

● Required

▲ Optional

[1] For PWATER

[2] For PSTEMP

[3] If volatilization from lake is simulated

[4] If photolysis is simulated

[5] If RCHRES is a lake

adapted from EPA BASINS workshop

In addition to those time series shown in the matrix, an evaporation time series can be used to simulate evaporative loss from the water's surface. This option is activated by supplying the POTEV time series in the User's Control Input (External Sources block); in NPSM this is done using the EVAP hourly evaporation time series supplied with BASINS WDM files. If the POTEV time series is absent from the UCI, HSPF assumes that the option is inactive and the corresponding evaporation flux is zero. The units for the POTEV and EVAP time series are in depth(inches)/interval. The code multiplies POTEV by the current surface area of the RCHRES to obtain the evapotranspiration output volume.

While the matrix shows the minimum weather data requirements for HSPF, the NPSM expects (i.e. it's hardwired in the code) the full suite of eight hourly time series (i.e. precipitation [PREC], potential evapotranspiration [PEVT], evaporation [EVAP], temperature [ATEM], windspeed [WIND], solar radiation [SOLR], dewpoint temperature [DEWP], cloud cover [CLOU]). Thus, the best bet for creating a custom WDM file for use with the NPSM is to add your own time series to an existing WDM file. You need only add new data sets for the time series your project will require according to the modules you've selected in the Control Cards screen. Also, you need to modify the INF file (in WDM Utility you do this when you save the WDM file) to associate the new time series with its respective HSPF input variable and weather station.

Finally, the evaporation coefficient (or pan coefficient - i.e. the ratio of lake evaporation to pan evaporation) in the inf file, is not used, but rather was included as a place holder for future code modifications. Ideally, the pan coefficient is multiplied by the pan evaporation to get water surface evaporation. This multiplication can take place prior to loading the evaporation (EVAP) time series to the WDM or as a multiplication factor in the EXT SOURCES block of the UCI. Realistically, since the pan coefficient is usually between .70 and .80, and surface water evaporation is a small component of the overall water balance (except in cases where the watershed is dominated by a lake or reservoir), whether the pan coefficient is used is typically insignificant.