



What is HydroGFD2.0?

Global Forcing Data for Hydrology

HydroGFD (Hydrological Global Forcing Data) is a merged data set of historical precipitation and temperature from meteorological reanalysis and global observations. The reanalysis system ERA-Interim from ECMWF uses atmospheric and surface observations to reproduce the observed weather and climate as closely as possible at a global scale. However, the reanalysis product has bias that prevents its direct use in hydrological models. HydroGFD is carrying out bias adjustment to remedy such issues, and to update the data set in near real-time for forecast initialisations.

To perform the adjustments, it is crucial to have good observational data. With HydroGFD2.0 the baseline climatology is first calculated for the period 1981-2009 combining satellite and station based observations. Absolute monthly mean data are then calculated by adding anomalies from different data sets to the climatology. Common for all variables are the resolution of 0.5 degrees (about 50 km) on a regular global grid, and the time period 1961 until present using reanalysis systems ERA40 (1961-1978) and ERA-Interim (1979 until present). Bias adjustments are only performed over land areas included in the observational data, and oceans default to the original reanalysis data. Table 1 lists the data sets used for each variable

Bias adjustment is performed separately for each single month with monthly mean precipitation, number of wet days and temperature. This leads to a data set of daily values of precipitation and daily mean, minimum and maximum temperature.

HydroGFD is a good approximation of the observed state at monthly time scales, but it is dependent on the performance of the reanalysis model at shorter time scales. Therefore, one cannot expect to capture single events at the daily time scale with this data set.

Table 1: Data sets used to create HydroGFD for three different time periods. Only the anomaly data sets are listed, the climatology is common for all time periods (precipitation: CHPClim and CPC-Unified and E-OBS, temperature: CPC-Temp and CRUts4.0).

Period	Reanalysis	Precipitation	Wet days	Temperature
1961-1978	ERA40	GPCCv7	CRUts4.0	CRUts4.0
1979-2016	ERA-Interim	CPC-Unified	CRUts4.0	CPC-Temp
2017-present	ERA-Interim	CPC-Unified	WD-method*	CPC-Temp