



Flow duration curves estimation at partially ungauged sites

Elena Ridolfi (1), Hemendra Kumar (2), and András Bárdossy (3)

(1) University of Perugia, Perugia, Italy (elena.ridolfi@unipg.it), (2) Department of Biosystems Engineering, Auburn University, Alabama, USA, (3) Institute for Modelling Hydraulic and Environmental Systems, University of Stuttgart, Stuttgart, Germany

The Flow Duration Curve (FDC) set up at a specific site has a key role to the knowledge of the streamflow characteristic at that site. Spite of its importance, because of the lack of streamflow gauging stations, the FDC construction can be a not straightforward task. We aim at showing that the FDC is not a characteristic of the basin, but rather of both the basin and the weather. Therefore, it is not possible to infer the FDC at a site using the parameters of the FDC built at the same site during a different period of time, because of different weather conditions. Similarly, the FDC built at a site for a specific period of time cannot be used to retrieve the FDC at a different site for the same time window. We propose a new methodology to estimate streamflow values at partially gauged basins (i.e. target sites) using discharge and precipitation data gauged at another catchment (i.e. reference catchment). The main idea is that it is possible to retrieve the discharge data of a target period of time using the data gauged during a given reference time period for which data are available at both target and reference sites. To test the methodology, several reference and target time periods are analyzed for two different case studies. The comparison between simulated and actually observed FDCs show the goodness of the approach especially for intermediate percentiles.