The hydrological regime in the Murray-Darling Basin has been altered due to flow regulation and water extraction. Assessment of river health in the Basin (e.g. Sustainable Rivers Audit, Davies et al 2008) has highlighted the ecological decline and its link to river regulation and the decline in flow variability. In providing for an integrated management plan for water resources in the Murray-Darling Basin the Murray-Darling Basin Authority has been involved in developing water requirements for key water-dependent ecosystems within the Basin. This work has highlighted the importance of providing fresh flows in rivers to increase habitat requirements for fish, allow for fish migration and cues for spawning. A methodology to identify fresh flows in a hydrological time-series was developed using an algorithm to characterise the level to which fresh events have altered. Using an output time series from hydrologic modelling, this algorithm assigns a ‘flow envelope’ in which fresh events occur; the lower limit is defined as the base flow (calculated using Fourier Analysis), while the upper limit is defined as a bankfull flow. These limits are site-specific, and were found to be well-correlated with empirical measurements. Based on criteria such as upstream catchment area and flow variability, we were able to measure the general characteristics of fresh events at approximately 100 sites across the Basin, and to determine the level to which these characteristics have changed due to irrigation regulation and water extraction. This informed the development of water requirements for rivers across the Murray-Darling Basin.