



Flow status versus flow discharge data for characterizing regimes of temporary streams

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The Ecological Status is the key condition to be evaluated in European rivers and streams according to the Water Framework Directive. In the Mediterranean, many of the unregulated streams from small and medium-sized basins have temporary flow regimes. The biological communities found in stream reaches are strongly dependent on the occurrence and duration of periods when the river channel is reduced to a series of pools or becomes totally dry. The ecological status of the temporary streams when only pools remain may be excellent as these provide refuges for many species, which may be different from those in permanent streams in terms of species composition. Common hydrological information recorded at stream gauging stations includes stream discharge and eventually some water quality properties, but when the discharge is very small or null, the critical condition for aquatic life, which is the persistence of water pools even in the absence of measurable flow, is not recorded. In the EU MIRAGE project (grant FP7 n° 211732), a flow status frequency graph that depicts the long-term monthly frequency of occurrence of the diverse flow statuses was developed. This graph is intended for regime characterisation, biological sampling calendar design and interpretation of biological water quality metrics, in terms of the limitations imposed by the stream regime. On the other hand, two metrics based on the frequency of occurrence of null flow discharges were developed: the average number of months with flow per year (Mf) and the seasonal predictability of no-flow months (Sd6). These methods were tested with data from eight temporary streams around the Mediterranean and will be used to help determine the ecological quality of these streams by updating the current methods contained in the European Water Framework Directive.