Country	SPAIN (ES)
Classification System:	**IBMWP (Iberian Biological Monitoring Working Party)**
General Description	Selection of reference sites according to REFCOND Guidance. Reference sites: "those where human pressure and impact in ecosystem are zero or the minimum possible". Results from Guadalmed project are used, what includes criteria for reference sites identification, based on uses of the basin, characteristics and status of riparian forest, channel and fluvial bed, reach regulation and physico-chemical characteristics (nutrients) (see reference criteria document). Biotic index IBMWP is commonly used in Spain (Mediterranean areas) as a national method (Alba-Tercedor & Sánchez-Ortega, 1988; Alba-Tercedor *et al.* 2002; GUADALMED project). It is the adaptation of British BMWP (Armitage *et al.* 1983) to the Iberian peninsular fauna. Sites (a river stretch of 20 times the river wide, with a minimum of 50 m. and a maximum of 300 m.) are sampled using multi-habitat method, at least once at each habitat using the appropriate methodology. Major habitats needs to be identified and sampled. A representative sampling of macroinvertebrate community and semi-quantitative data is obtained (range of abundance). Macroinvertebrates are collected by kicking and sweeping the river bed, holding and scraping the stones and collecting the organisms present among the vegetation, submerged roots, macrophytes, and pools. Sampling must continue until no new families appear in the successive samples for each habitat. In the laboratory, complex samples are divided in homogeneous subsets. A minimum of 200 individuals should be identified and counted. Proportional number of individuals for each family are established in all sample (extrapolated for different subsets). Macroinvertebrate are identified at family level. A semi-quantitative data are obtained in 5 ranges: 1 (1 – 3 individuals), 2 (4 – 10 individuals), 3 (11 – 50 individuals), 4 (51 – 100 individuals), 5 (more than 100 individuals).

Ecological Quality Classes: To set quality levels, the universe of values adopted by the biological index are studied, establishing the quality classes depending on the deviation degree from data obtained in the reference sites previously defined. So to each type, quality classes are established following WFD criteria. Intervals that fulfil defined conditions would be obtained, considering the percentages corresponding to 25th percentile: 100%, 61%, 36% y 15%, respectively, the boundaries between the five ecological status classes (figure 1).

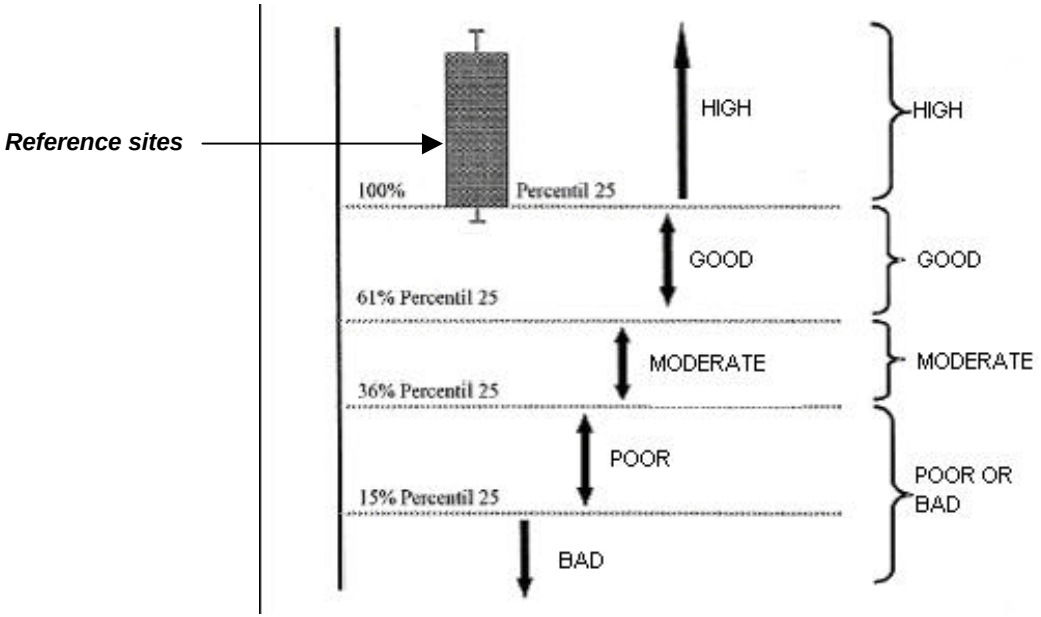


Figure 1: Scheme for the evaluation of ecological quality classes (Alba-Tercedor *et al.* 2002) proposed and used in Spain (unofficial method)

Criteria for Boundary Setting	**High/Good boundary**	**Good/Moderate boundary**
Taxonomic composition and abundance	25th percentile of reference values using IBMWP index Taxonomic composition considered at family level Abundance is not considered	61% 25th percentile of reference values using IBMWP index Taxonomic composition considered at family level Abundance is not considered
Ratio of disturbance sensitive to insensitive taxa	25th percentile of reference values using IBMWP index Sensitive taxa is considered by scoring families	61% 25th percentile of reference values using IBMWP index Sensitive taxa is considered by scoring families
Level of diversity	25th percentile of reference values using IBMWP index Number of taxa (richness) is considered by a sum of the scores for each family	61% 25th percentile of reference values using IBMWP index Number of taxa (richness) is considered by a sum of the scores for each family

References

Alba-Tercedor J. & Sánchez-Ortega A., 1988. Un método rápido y simple para evaluar la calidad biológica de las aguas corrientes basado en el de Hellawell (1978). *Limnetica* 4: 51-56.

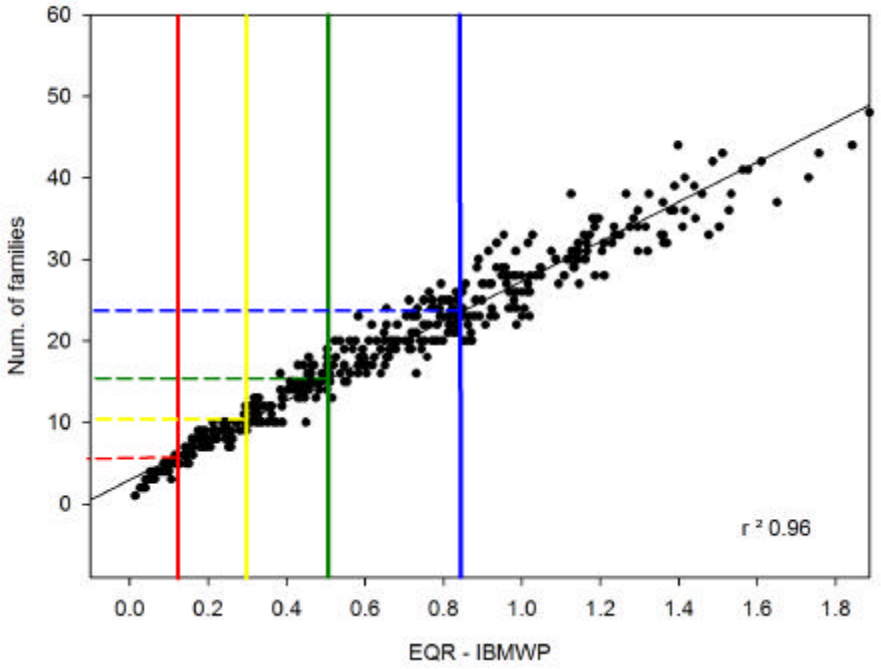
Alba-Tercedor J., Jáimez-Cuellar P., Álvarez M., Avilés J., Bonada N., Casas J., Mellado A., Ortega M., Pardo I., Prat N., Rieradevall M., Robles S., Saínz-Cantero C., Sánchez-Ortega A.,Suárez M.L., Toro M., Vidal-Abarca M. R.,Vivas S. & Zamora-Muñoz C. 2002. Caracterización del estado ecológico de ríos mediterráneos ibéricos mediante el índice IBMWP (antes BMWP'). *Limnetica* 21 (3-4): 175-185.

Armitage P.D., Moss D., Wright J. F. & Furse M. T. 1983. The performance of a new biological water quality score system based on macroinvertebrates over a wide range of unpolluted running-water sites. *Water Research* 17(3): 333-347.

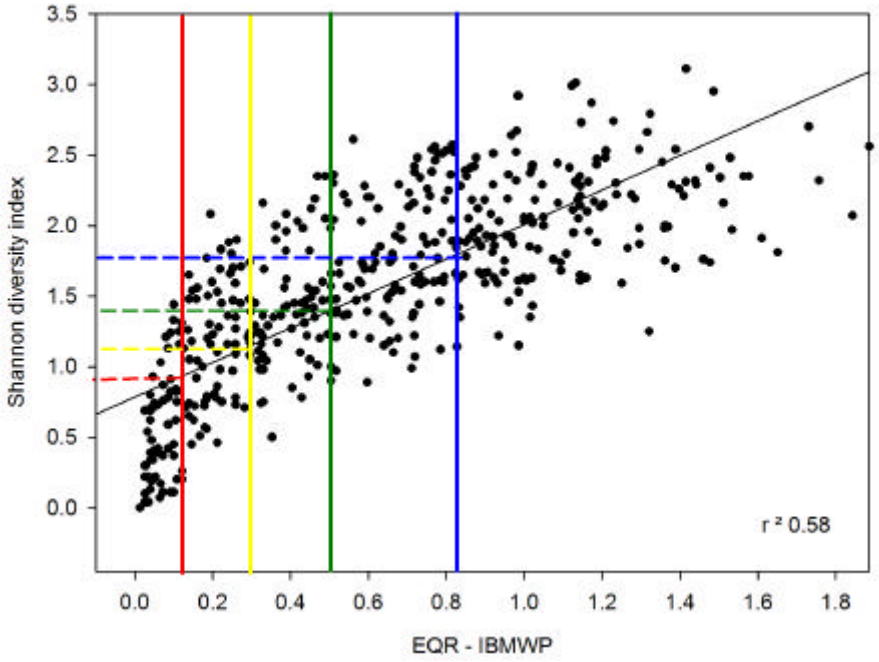
GUADALMED project WEB page: www.guadalmed.org (IBMWP protocol available in English)

Appendix (ES):

Figures 2-3. Number of families and Shannon diversity index vs. ES national method (IBMWP) for all river types

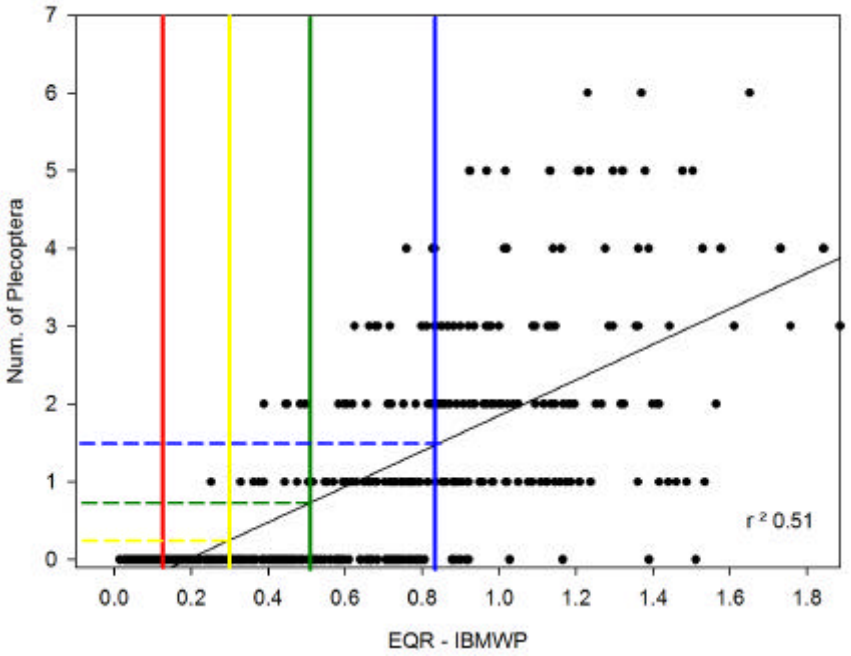


Number of families vs. ES national method (IBMWP)

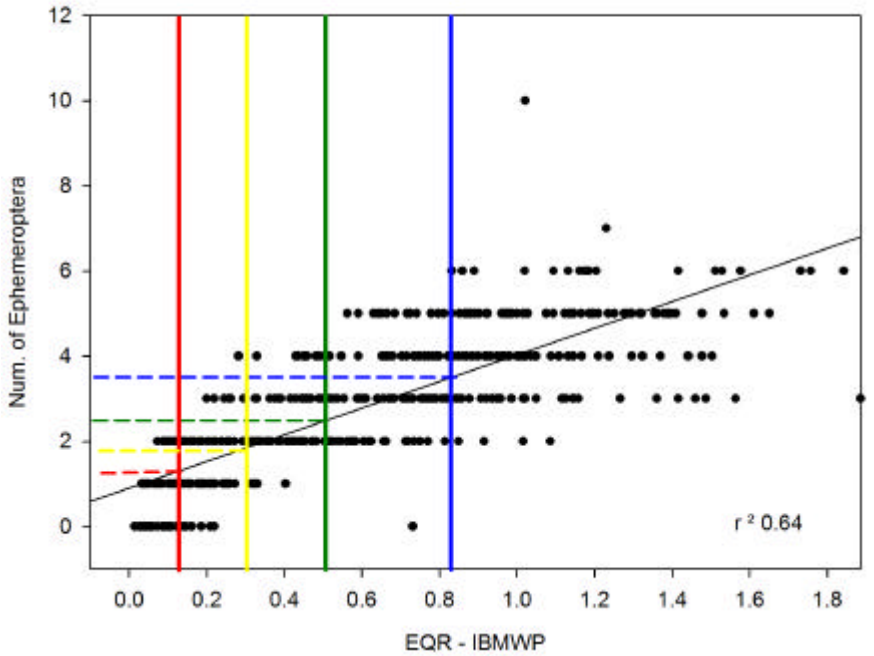


Shannon diversity index vs. ES national method (IBMWP)

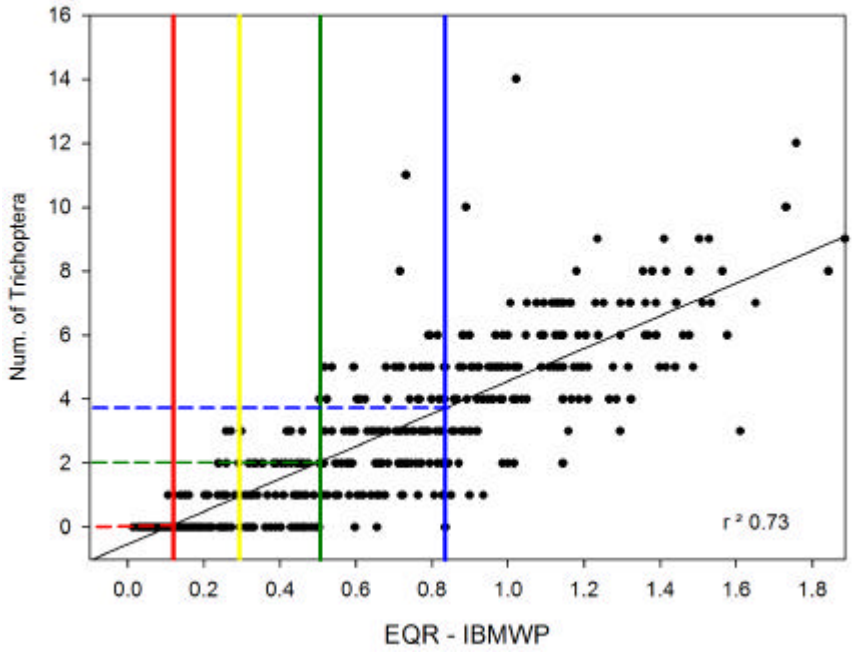
Figures 4-7. Number of Plecoptera, Trichoptera and Ephemeroptera vs. ES national method (IBMWP) for all river types



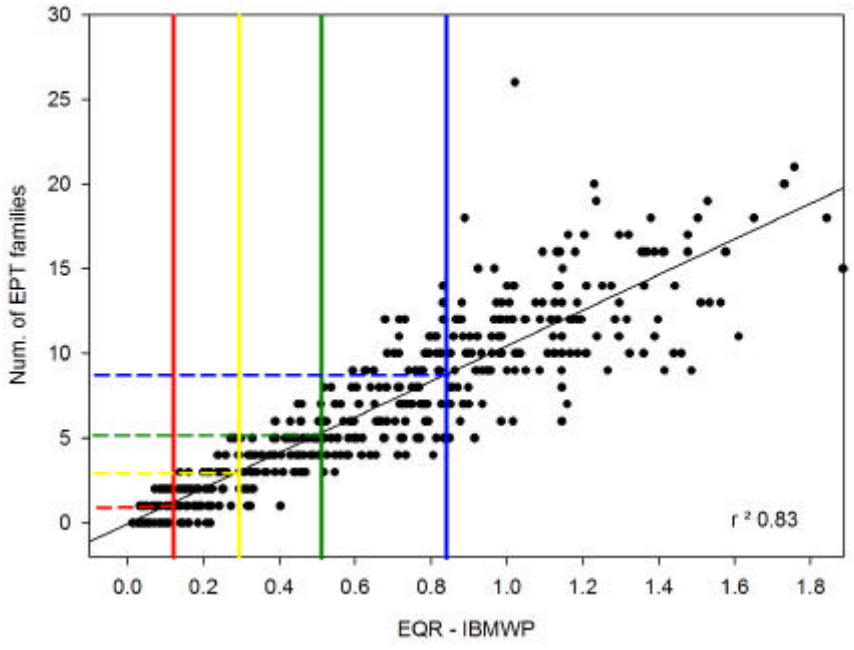
Number of plecoptera (family level) vs. ES national method (IBMWP)



Number ephemeroptera (family level) vs. ES national method (IBMWP)



Number of trichoptera (family level) vs. ES national method (IBMWP)



Number of plecoptera, ephemeroptera and trichoptera (family level) vs. ES national method (IBMWP)

Figure 8. Missing major taxonomic groups: selected EPTCD vs. ES national method (IBMWP)

We consider a selection of the major taxonomic groups (major sensitive taxa found in Mediterranean rivers) at family level to analyse the EQR-IBMWP class boundaries. The following groups are considered as a major taxonomic groups:

- PLECOPTERA: all families
- EPHEMEROPTERA: Leptophlebiidae, Ephemerellidae and Heptageniidae.
- TRICHOPTERA: Philopotamidae, Limnephilidae, Psychomyiidae, and Sericostomatidae
- COLEOPTERA: Elmidae, Dryorpidae
- DIPTERA: Athericidae