

Country	PORTUGAL												
Classification System:	Invertebrate Portuguese Index IPTI A New Official Method for Portugal												
General Description	<p>1. General description</p> <p>The National Assessment Method of Portugal for Invertebrates integrates the ideas developed in the REFCOND Project and ECOSTAT IC GIGs.</p> <p>Portugal intercalibrates in 3 IC types using one national type for each IC type. In this description only the indexes adopted for those national types are indicated.</p> <p>Two indexes, both developed by the Med GIG, are used: for R-M1 and R-M2 the index is IPTI_N (= ICM7, the quantitative ICM for all IC types but R-M5), and for R-M5 the index is IPTI_S (= ICM10, the quantitative ICM for R-M5).</p> <p>These 2 indexes were initially designed for the purpose of IC in the Mediterranean GIG as a translation index making possible the comparison of boundaries from the national classification systems. Those indexes (ICM7 and ICM10) after being tested with pressure data from several GIG Member States (MS) were considered as responsive to pressures and accepted by the GIG (cf. Med Riv GIG - Minutes of Evora Meeting, 2004; Med Riv GIG - Minutes of Lyon Meeting, 2004; Med Riv GIG - Minutes of Pafos Meeting, 2006). These indexes have a large similarity with the ICM that the GIG eventually selected - ICM-STAR - with the advantage of only including metrics which proved to be responsive to pressures using datasets from some GIG MS.</p> <p>The 2 indexes assess the general degradation impact on invertebrate fauna, i.e. they are not stressor-specific indexes. Index results are expressed as EQRs and thus respond to WFD requirements.</p> <p>Metrics and weights of the 2 Indexes are indicated in Tables 1 and 2. Identification level is family.</p> <p>Table 1. IPTI_N metrics and weights</p> <table> <tr> <th><i>Metrics</i></th><th><i>Weight</i></th></tr> <tr> <td>Nb Families</td><td>0.25</td></tr> <tr> <td>EPT</td><td>0.15</td></tr> <tr> <td>Evenness</td><td>0.10</td></tr> <tr> <td>IASPT-2</td><td>0.30</td></tr> <tr> <td>log (Selected ETD+1)</td><td>0.20</td></tr> </table>	<i>Metrics</i>	<i>Weight</i>	Nb Families	0.25	EPT	0.15	Evenness	0.10	IASPT-2	0.30	log (Selected ETD+1)	0.20
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EPT is the number of families of Ephemeroptera, Plecoptera, Trichoptera

Evenness (aka Pielou) index is the equitability of Shannon-Wiener's diversity index (H), i.e. H/H_{max}

IASPT is the Iberian ASPT (Iberian BMWP divided by number of families)

$\log(\text{Selected ETD}+1)$: \log_{10} of 1 + sum of abundance of Heptageniidae, Ephemeridae, Brachycentridae, Goeridae, Odontoceridae, Limnephilidae, Polycentropodidae, Athericidae, Dixidae, Dolichopodidae, Empididae, Stratiomyidae

Table 3. IPTl_s metrics and weights.

<i>Metrics</i>	<i>Weight</i>
Numb. Families	0.4
IASPT - 2	0.2
EPT	0.2
Log Sel EPTCD+1	0.2

Sel EPTCD includes: Chloroperlidae, Nemouridae, Leuctridae, Leptophlebiidae, Ephemerellidae, Philopotamidae, Limnephilidae, Psychomyiidae, Sericostomatidae, Elmidae, Dryopidae, Athericidae. This metric includes sensitive families which usually occur in temporary streams.

The metrics were selected with the purpose of responding to WFD requirements regarding "taxonomic composition and abundance", "ratio of disturbance sensitive to insensitive taxa", and "level of diversity" (cf. Med Riv GIG Minutes) .

Invertebrate collection follows a multi-habitat sampling scheme. Major habitats are proportionally sampled according to their presence within the stream reach. Sampling period is Spring.

For the boundary setting, the approach followed the procedure initially developed in the Med Riv GIG:

1. Selection of the reference sites according to the Reference Criteria based on the REFCOND Project outcomes (see Annex of this report);
2. High/Good boundary was set as the 25th percentile of the reference site values of IPTl_i;
3. All the other boundaries resulted from splitting into 4 equal width classes the remaining gradient from H/G boundary value to zero.
4. Final value is presented as EQR, dividing each observed value by the median value of the references.

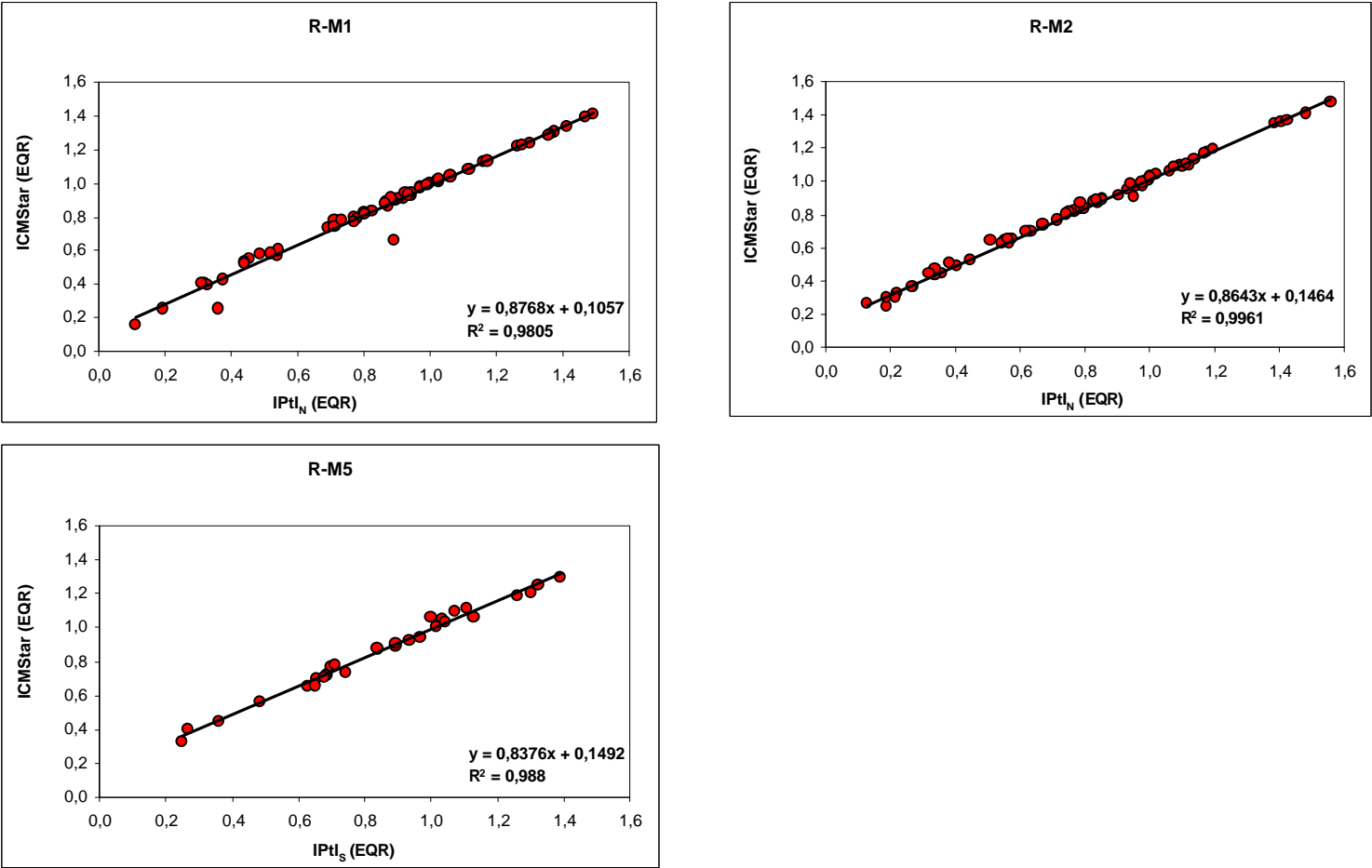
Table 4. Boundaries for the indexes and IC types using only data from one particular national type for each IC type .

<i>Boundaries</i>	IPtI _N		IPtI _S
	<i>R-M1</i>	<i>R-M2</i>	<i>R-M5</i>
High-Good	0.892	0.835	0.864
Good-Moderate	0.669	0.626	0.648
Moderate-Poor	0.446	0.418	0.432
Poor-Bad	0.223	0.209	0.216

2. National Method - ICM regression / Translation of the National Method into ICM-STAR

The indexes of the National Method of Portugal which are being intercalibrated share a number of metrics with the adopted ICM (ICM STAR). Because of this similarity, the regression coefficients are very high. For this reason, the translation of the national indexes into ICM is possible with a very high level of accuracy (Figure 1).

Figure 1. National Invertebrate Indexes of Portugal (IPtl) - ICM regressions for R-M1, R-M2, R-M5.



3. IPtI and WFD Normative Definition

Missing major taxonomic groups - Number of families

Number of families is one of the metrics of the index which partially explains the good IPtI - Number of families correlation. No discontinuities are observed. Good-Moderate boundaries correspond to 20 families in R-M1 and 15 in R-M2 (Figure 1).

For R-M5, G-M boundary corresponds to 15 families (Figure 2).

Figure 1. IPtI_N vs. Number of Families for R-M1 and R-M2.

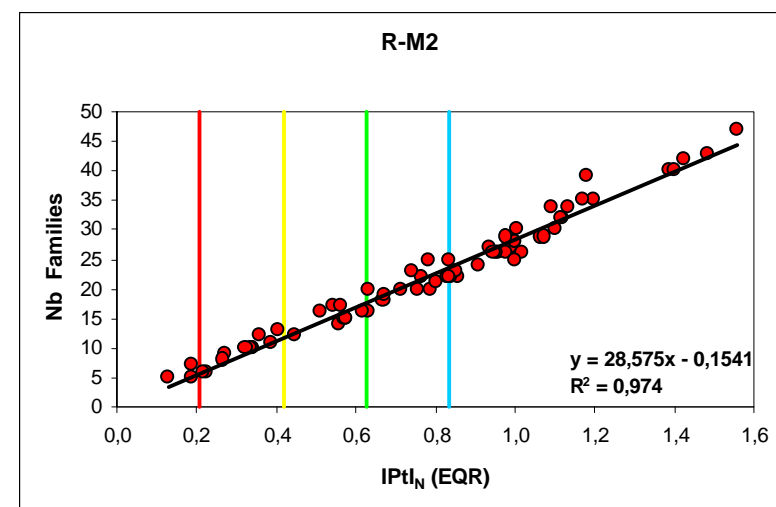
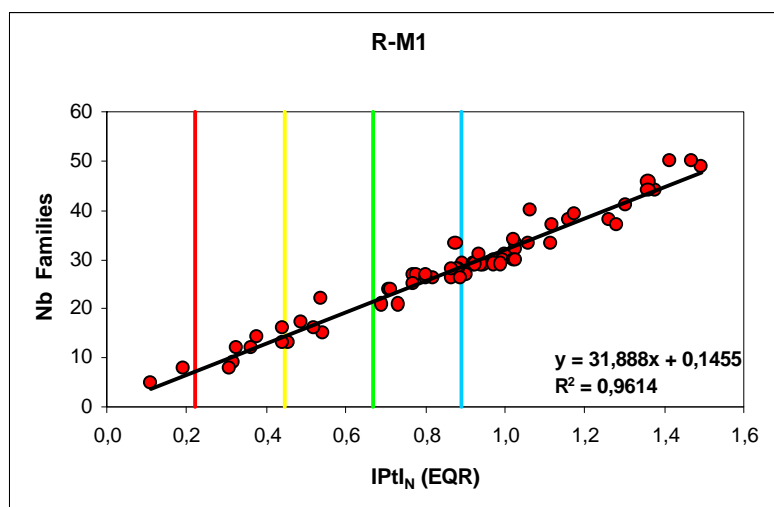
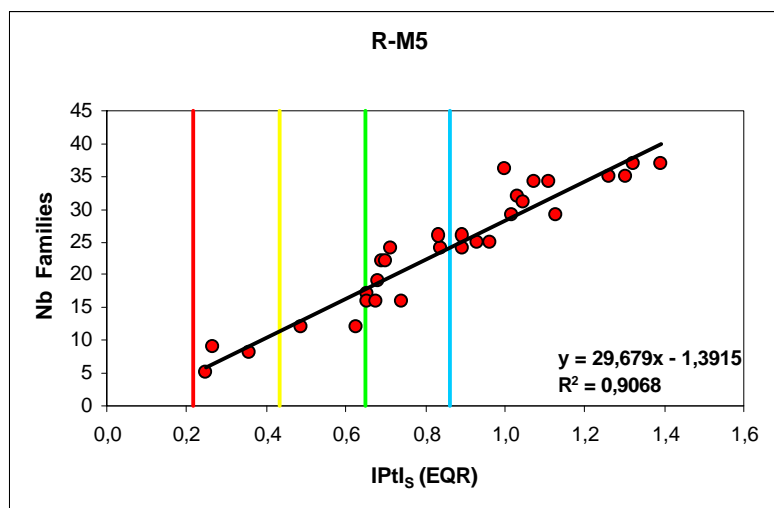


Figure 2. IPTI₅ vs. Number of Families for R-M5.



Sensitive Species - EPT:

EPT and related metrics are included in both indexes in order to evaluate the ratio of sensitive to tolerant taxa.

Boundary G-M corresponds approximately to 8 or 7 EPT families for R-M1 and R-M2 (Fig. 3). For R-M5 there is no clear cut dividing Good sites from Moderate sites (Fig. 4).

Figure 3. IPTl_N vs. EPT taxa for R-M1 and R-M2.

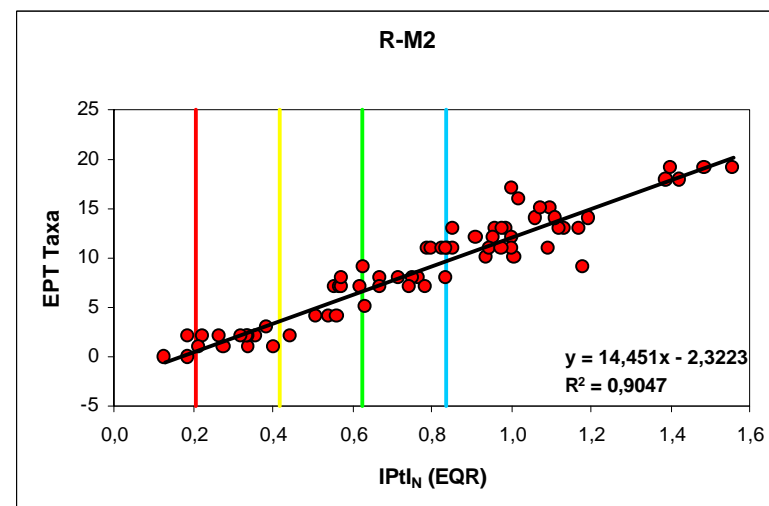
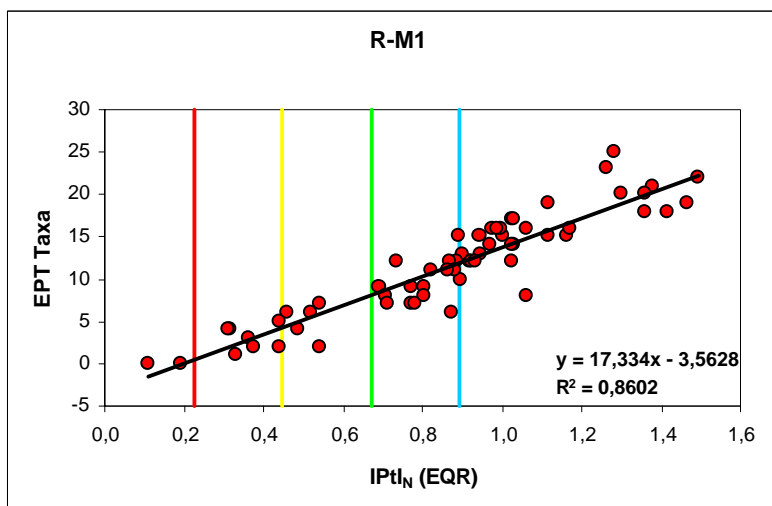
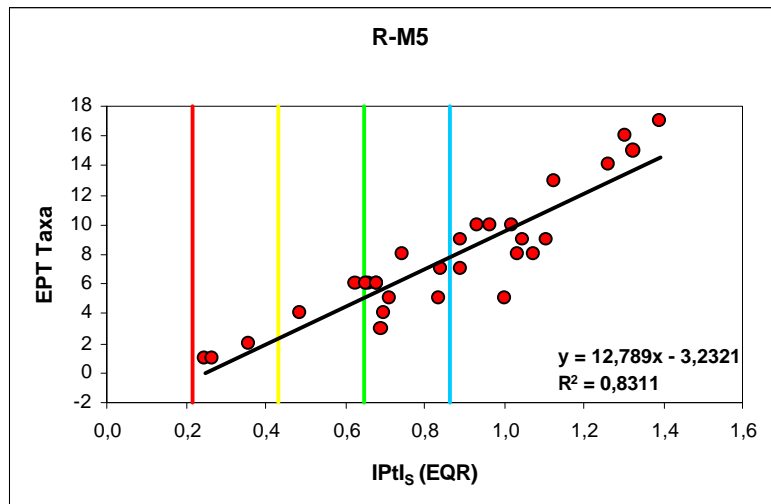


Figure 4. IPTl_s vs. EPT taxa for R-M5.



Sensitive Species - Ephemeroptera:

Most sites in the Good class present 4 or more Ephemeroptera families and most Moderate sites present 3 or less families in R-M1 and R-M2 (Fig. 5). There is no clear division for R-M5 (Fig. 6). Ephemeroptera are only missing in the Poor class (Figs. 5 and 6).

Figure 5. IPTI_N vs. Ephemeroptera taxa for R-M1 and R-M2.

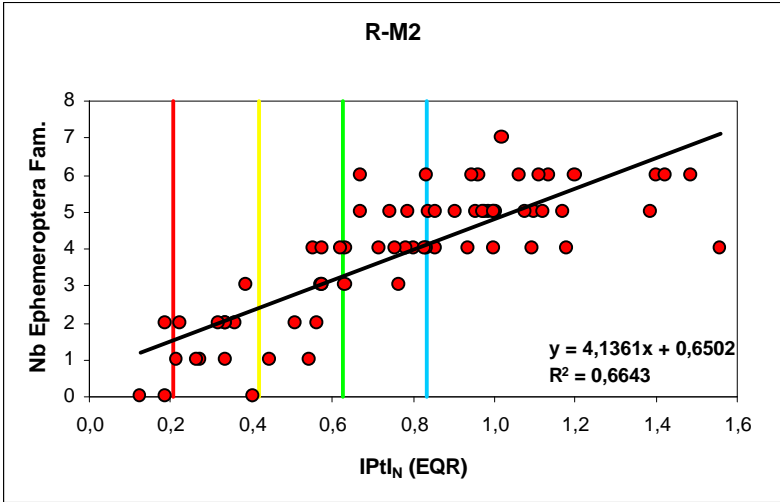
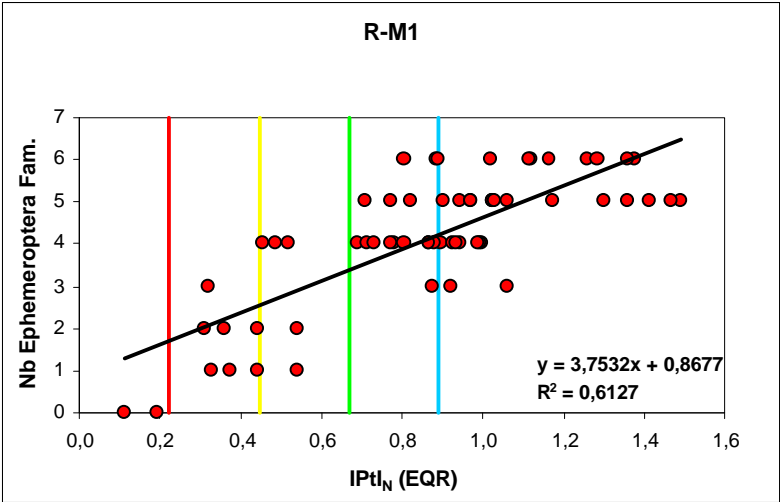
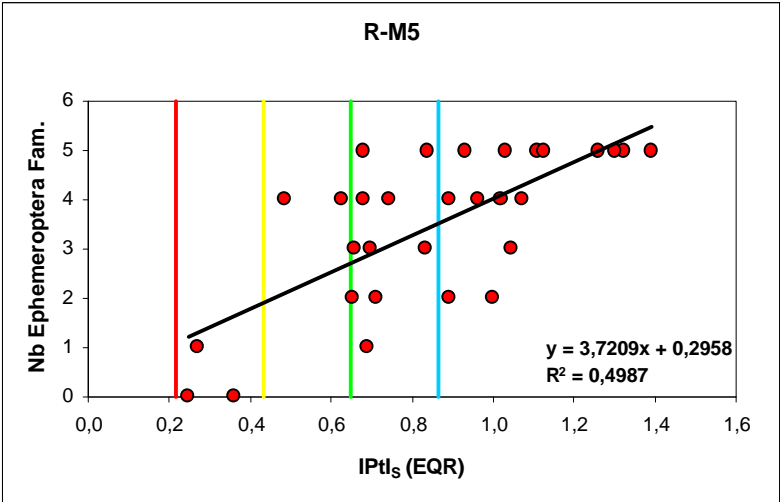


Figure 6. IPTl_s vs. Ephemeroptera taxa for R-M5.



Sensitive Species - Plecoptera:

For Plecoptera correlation is much lower, particularly for R-M5 (Figs. 7 and 8). Because of the larger dispersion of values, it is not possible to separate Good and Moderate classes on the number of Plecoptera taxa. In R-M1 and R-M2, Poor and Bad sites present no Plecoptera but also some Moderate and Good sites (Fig.7). Moderate class presents less than 3 Plecoptera families in R-M1, and less than 2 in R-M2.

Figure 7. IPTl_N vs. Plecoptera taxa for R-M1 and R-M2.

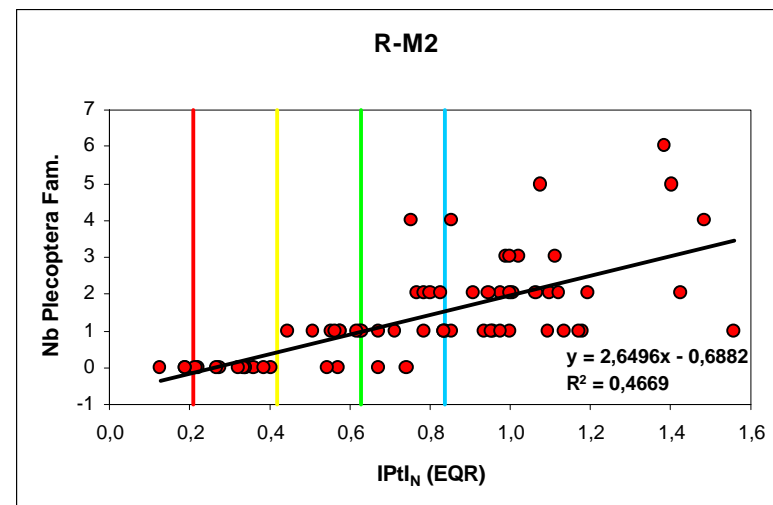
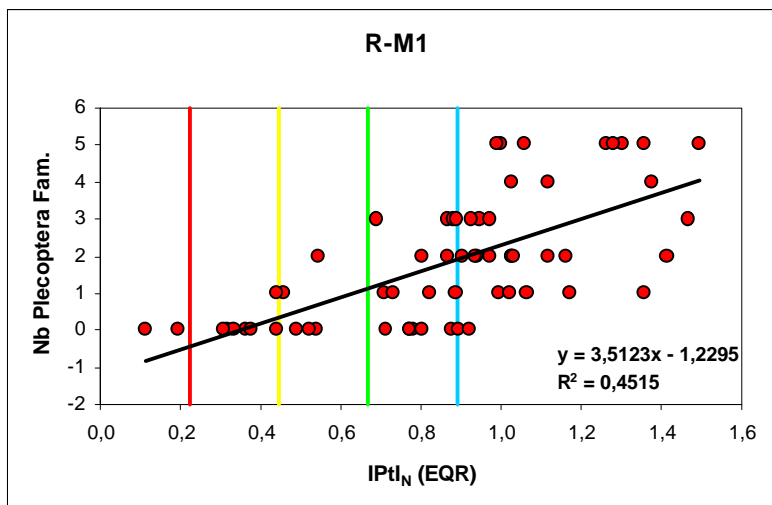
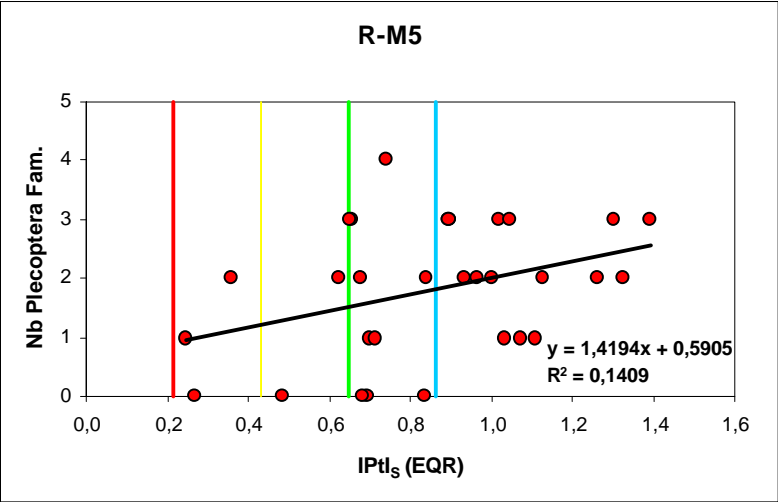


Figure 8. IPtI_N vs. Plecoptera taxa for R-M5.



Sensitive Species - Trichoptera:

Moderate class presents less than 4 Trichoptera families for R-M1 and less than 5 for R-M2 (Fig. 9) but no clear separation of Good and Moderate classes exists.

In R-M5, Moderate class presents less than 2 Trichoptera family but a proportionally high number of Good sites has no Trichoptera (Fig.10).

Figure 9. IPTl_N vs. Trichoptera taxa for R-M1 and R-M2.

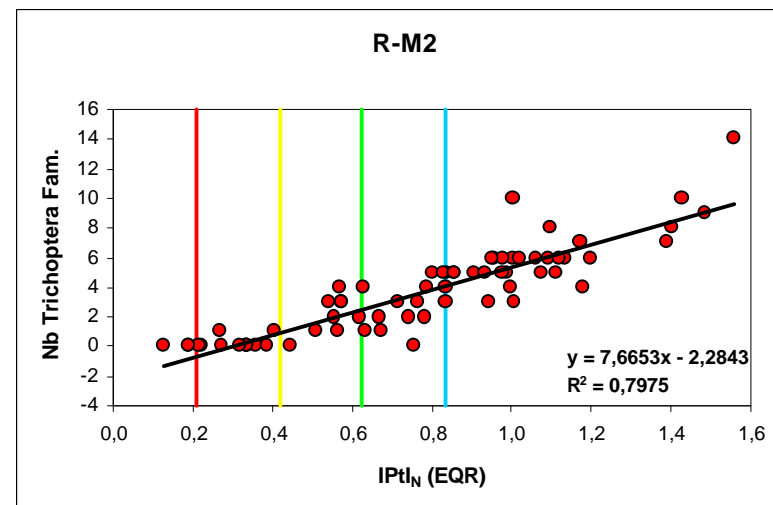
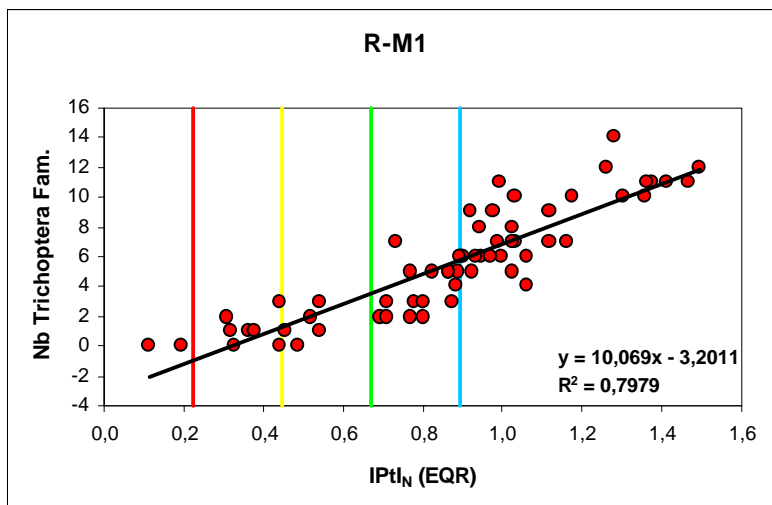


Figure 10. IPTI_N vs. Trichoptera taxa for R-M5.

