

# ECOLOGICAL INDICATOR VALUES OF EUROPE (EIVE) 1.0: A POWERFUL OPEN-ACCESS TOOL FOR VEGETATION SCIENTISTS

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**Background:** Ecological indicator values (EIVs) have a long tradition in vegetation ecological research in Europe. EIVs characterise the ecological optimum of species along major environmental gradients using ordinal scales. Calculating mean indicator values per plot is an effective way of bioindication. Following first systems in Russia and Central Europe, about two dozen EIV systems have been published for various parts of Europe.

**Aims:** As there was no EIV system available at European scale that could be used for broad-scale analyses, e.g. in the context of the European Vegetation Archive (EVA), we develop such a system for the first time for the vascular plants of Europe.

**Location:** Europe.

**Methods:** We compiled all national and major regional EIV systems and harmonized their plant nomenclature with a newly developed contemporary European taxonomic backbone (EuroSL 1.0). Using regression, we rescaled the individual EIV systems for the main

parameters to continent-wide quasi-metric scales, ranging from 1 to 99. The data from each individual system were then translated into a probability curve approximated with a normal distribution, weighed with the logarithm of the area represented and summed up across the systems. From the European density curve we extracted then a mean and a variance, which characterise the distribution of this species along this particular ecological gradient.

**Results and conclusions:** Our consensus approach of integrating the expert knowledge of all existing EIV systems allowed deriving the first consistent description of the ecological behaviour for a significant part of the European vascular flora. The resulting Ecological Indicator Values of Europe (EIVE) 1.0 will be published open access to allow bioindication beyond country borders. Future releases of EIVE might contain more parameters, non-vascular plants and regionalisation or could be re-adjusted and extended to hitherto non-covered species through co-occurrence data from EVA.