Call for long-term benthic invertebrate data from European streams and rivers

Dear colleague,

Recent analyses of long-term data on riverine benthic invertebrates resulted in contrasting patterns and did not reveal a coherent picture concerning the decrease or increase of important benthic invertebrate community metrics, like abundance, richness, and composition (e.g. Blowes et al. 2019, Baranov et al. 2020, van Klink et al. 2020). In a new collaborative study, we aim to (a) compile a comprehensive dataset incorporating different individual studies and (b) to disentangle the major patterns (and drivers) of long-term trends in benthic invertebrate assemblages using various community metrics, species traits and frequently available environmental variables.

a) Compiling long-term benthic invertebrate data from European streams and rivers. Initial data sources (that need to be checked carefully) are available from: Pilotto et al. (accepted); van Klink et al. 2020; Jourdan et al. 2018. However, there are many more, so far unexplored data sources that we would like to mobilize with this call to the European freshwater and LTER community. These data need to fulfill the following requirements:
- minimum length of time series: 10 years
- minimum number of sampling years: 8
- sampling occurred at the same site (no space-for-time substitution)
- no change in sampling method, season and taxonomic resolution over the observation period
- taxa lists with abundance data
- identification level: species to families

b) potential analyses:
- a 2-step approach: first, calculating various (community/trait) metrics for each time series; second, applying a meta-analytic approach to identify patterns across all the datasets
- testing the robustness of our results by applying a sensitivity analysis to account for the most likely unbalanced design (e.g., uneven data distribution across Europe)
- potential community metrics (examples): abundance, richness, evenness, temporal turnover in assemblage composition, ...
- using https://www.freshwaterecology.info/ as an important source for trait analyses (zonation, saprobity, temperature, dispersal, …)
- associating climate and land use data as well as global catchment models (e.g., Domisch et al. 2015 Scientific Data) to each biodiversity time series to investigate potential drivers of change
- analyzing the various taxonomic groups separately (insects - non-insects; order-wise, etc.)

If you do have long-term benthic invertebrate data that fulfill the above described criteria and you are interested to join our initiative, please send your data (ideally in the format given below) to peter.haase@senckenberg.de not later than 30 June 2020. We offer co-authorship to all data providers. We aim to get this paper published in a journal with a high impact factor. Please, be aware that today most journals have an "open data policy". This means that we need to publish your raw data if our manuscript will be accepted.

Looking forward to working together with you!
Best wishes,
Peter Haase, Nuria Bonada, Wolfram Graf, Jani Heino, Daniel Hering, Sonja Jähnig, Astrid Schmidt-Kloiber

Data format requirements

Columns should be formatted in long format and include if available:

(Label suggestions in bold)

- "**X_coordinate**": geographic X coordinate of sampling site (longitude, WGS 84)
- "**Y_coordinate**": geographic Y coordinate of sampling site (latitude, WGS 84)
- "**Region_ID**": Name / ID of the region / river if many sites (traps) are going to be pooled to one location.
- "**Site_ID**": Name / ID of the sampling site
- "**Sampling_date**": Date of sampling (date format requirements: see below)
- "**Sampling_method**": e.g., RIVPACS (either provide a reference or a short description of the method)
- "**Taxon**": Taxa name formatted as e.g. "Baetis rhodani"; better: taxa ID from freshwaterecology.info
- "**Abundance**": Number of captured individuals

Please provide a metadata table explaining all abbreviations used in columns and briefly the content of each column if not self-explanatory.

IMPORTANT – please check before sharing data:
o   **Check whether each entry in each column has continuously the same format**
o   **PAY SPECIFIC ATTENTION TO FORMAT OF DATE AND TAXA NAMES**
§ **Example date 22.04.2020** (don't mix different formats such as 2020.04.22; 22.4.2020; 22.April.2020; 22/04/2020, etc., in the same column)
§ **Example Taxa: Correct species name: "***Baetis rhodani***"** (don't include first describer in the name, e.g. **NOT** "*Baetis rhodani Pictet*"). **Wherever possible use taxa IDs from *freshwaterecology.info***
§ If only the genus is known, use *Baetis sp.* continuously (don't mix different formats such as *Baetis spp.*, or *Baetis spec.*, etc.; in the same column)