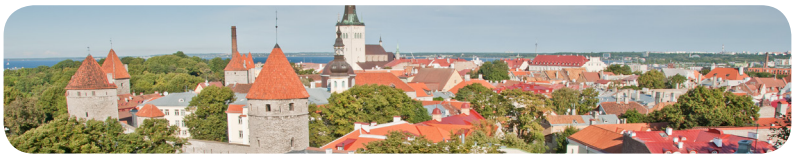
WISER news

Run on the final conference in Tallinn, January 2012



More than 100 "early birds" already registered for the WISER Final Conference in Tallinn, 23-26 January 2012. Roughly five months prior to the event, this notable recognition by both scientists and end users is very promising, so that we are likely to be fully booked soon. Don't hesitate any longer, if you have not registered yet!

The two-day conference is split into an assessment block (25 January) and a management block (26 January). The assessment block will provide the basic outcome and synthesis of the WISER lake and transitional/coastal experts, for instance the development and testing of new assessment metrics and multimetric indices. Their presentations are embedded in several external contributions so that the whole story will be told, from the assessment origin almost a decade ago up to the future of ecosystem assessment.

The future perspective, thereby, will also address important gaps that have gained little attention in WFD-compliant assessment, yet belong to integrated ecosystem assessment for long, such as the loss of biodiversity and corresponding ecosystem functions and services.

The management block will then build on this and present a synthesis of WISER's management and integration workpackages. For lakes, rivers and transitional/coastal waters, the management options and best practice measures will be presented and discussed in light of current ecosystem drivers and pressures, but also in light of anticipated future impacts due to global and climate change. The integration will address the comparisons of biological quality elements, water categories and habitats therein with regard to assessment and management.

A separate keynote talk is dedicated to the subject of uncertainty and will address the different sources of uncertainty as well as recommendations to reduce uncertainty in the various steps of ecosystem assessment, for instance, by application of smart sampling designs and the selection of robust metrics. The management block is framed by three presentations that provide a broader view of current river basin and ecosystem management in Europe and North America.

Christian K. Feld (UDE)

All about the WISER conference:

www.wiser.eu/meetings-and-events/final-conference

Content

Impressum

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- responsible for the content: University of Duisburg-Essen

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Tallin conference — List of plenary presentations

Day 1: Ecosystem assessment and related uncertainty

- Overview and outcome of WISER, future research needs and obstacles (Daniel Hering, University of Duisburg-Essen, Essen, Germany)
- Integration of intercalibration into River Basin Management (tentative title, Ursula Schmedtje, European Commission, DG Environment, Brussels, Belgium)
- Methods and results of lake assessment (Anne Lyche Solheim, Norwegian Institute for Water Research (NIVA) Oslo, Norway)
- Methods and results of transitional/coastal water assessment (Angel Borja, AZTI-Tecnalia Foundation, Spain)
- Sources of uncertainty in lake and transitional/coastal water assessment (Mike Dunbar, Natural Environment Research Council, Centre for Ecology & Hydrology (NERC), UK)
- Combination of Biological Quality Elements towards complete water body assessment (Wouter van de Bund, European Commission, Joint Research Centre, Ispra, Italy)
- Comparison of assessment across rivers, lakes and transitional/coastal waters (Richard Johnson, Swedish University of Agricultural Sciences, Uppsala, Sweden)
- Tales from the riverbank: separating the myths from the reality of river restoration (Guy Woodward, Queen Mary University of London, London, UK)
- Relation of the WFD to other directives—the ecosystem approach (Laurence Mee [to be confirmed], Plymouth University Marine Institute, Plymouth, UK)

More specific results of individual workpackages and partner organisations will be presented during the poster presentation in the afternoon.

Day 2: Management, restoration and the impact of global and climate change

Best practice management options targeting at different water types and stressors will be presented and discussed in the light of potential effects of climate change.

- River Basin Management Plans - experiences and outlook (Peter Kristensen, European Environmental Agency (EEA), Copenhagen, Denmark)
- River management, restoration and the impact of global and climate change (Christian Feld, University of Duisburg-Essen, Essen, Germany)
- Lake management, restoration and the impact of global and climate change (Erik Jeppesen, Aarhus University, National Environmental Research Institute (NERI), Aarhus, Denmark)
- Transitional/coastal water management, restoration and the impact of global and climate change (Jacob Carstensen, Aarhus University, National Environmental Research Institute (NERI), Aarhus, Denmark)
- Assessment, management and restoration of water bodies in the United States ([tentative title], Sarah Lehman, U.S. Environment Protection Agency, USA)
- Comparison of recovery processes in rivers, lakes and transitional/coastal waters (Piet Verdonschot, ALTERRA, Wageningen, The Netherlands)
- Lessons learned from large-scale coastal ecosystem restoration: more synthetic and strategic planning needed (Charles “Si” Simenstad, University of Washington, Seattle, USA)

More specific results of individual workpackages and partner organisations will be presented during the poster presentation in the afternoon.

A moderated plenary discussion will then close the WISER Final Conference and provide plenty of time to discuss all presentations and raise specific questions.

Find more information on the venue and contact details in the conference flyer:
http://www.wiser.eu/download/WISER_final_conf_flyer.pdf.

Recent publication highlights (I)

Zooplankton is crucial! Why its omission in WFD lake monitoring is unwise

(Original title: *Zooplankton as indicators in lakes: a scientific-based plea for including zooplankton in the ecological quality assessment of lakes according to the European Water Framework Directive (WFD)*; by Erik Jeppesen et al. 2011, Hydrobiologia, DOI 10.1007/s10750-011-0831-0)

As a matter of surprise to lake ecologists all over Europe, zooplankton was–and still is–not being considered a biological quality element in the European Water Framework Directive. Being a key player in lake food webs, however, zooplankton is ecologically meaningful and has been used for bioindication in routine monitoring of lakes for many decades. Now, after being omitted by the Directive, zooplankton has been withdrawn from many monitoring programmes. This also imposes unprecedented implications on the continuity of long-term monitoring subjected, for instance, to climate change research.

In their review, Erik Jeppesen and co-authors highlight the role of zooplankton in lake monitoring. By comparing monitoring data from Denmark, Estonia and the UK, the authors show that zooplankton constitutes a reliable and inexpensive indicator group capable of assessing the trophic status of lakes. Its replacement by other organism groups, such as fish or phytoplankton, is impractical, if not inefficient. The scientists also point at the invaluable attribute of zooplankton, to indicate lake management and restoration success. Accordingly, Jeppesen et al. strongly recommend correcting its omission, and instead include zooplankton as a central biological quality element in lake assessment and monitoring programmes. As a first crucial step, this requires to develop novel assessment tools similar to those already created for the other organism groups.

Christian K. Feld (UDE)

Recent publication highlights (II)

Combined approaches to set reference conditions are more useful than single ones

(Original title: *The importance of setting targets and reference conditions in assessing marine ecosystem quality*; by Angel Borja, Daniel M. Dauer and Antoine Grémare 2011, Ecological Indicators, DOI 10.1016/j.ecolind.2011.06.018)

For a decade, the development of indices and tools to assess and monitor the ecological status of the marine environment is subject to numerous research and monitoring activities throughout Europe. Their comparison and the evaluation of deficiencies with respect to the quality targets have often been debated, but little attention has been drawn to the methods used for setting the ground for assessment, i.e. the reference conditions. This step is crucial for sound assessment, as it is the fundamental requirement for the application of the reference condition approach inherent to the EU Water Framework Directive.

Borja and co-authors, therefore, reviewed the approaches available in the literature on setting both real reference conditions, for instance by using pristine areas, hindcasting, modelling or expertise and quality targets, i.e. past and present baseline scenarios and trends. The authors then scored the different approaches of setting reference conditions and tested them using a reference multivariate index: the AMBI (= AZTI's Marine Biotic Index). Data from 29 transitional and coastal reference waters in 14 countries of Europe and North America were used to study the AMBI's response to human pressures. The results showed that cases where the AMBI failed to detect human stress can be linked to the use of inappropriate methods to define and set the reference conditions.

Borja and co-authors concluded that based on their analysis, it seems that using a combination of methods in setting reference conditions, is more adequate in obtaining final quality assessments related to the pressures than one method alone.

Christian K. Feld (UDE)

Recent publication highlights (III)

A review of restoration studies raises the need for better integration of measures and management

(Original title: *From Natural to Degraded Rivers and Back Again: A Test of Restoration Ecology Theory and Practice*; by Christian K. Feld et al. 2011, Advances in Ecological Research 44, Amsterdam, The Netherlands, pp. 119–209. DOI 10.1016/B978-0-12-374794-5.00003-1)

Extensive degradation of ecosystems, combined with the increasing demands placed on the goods and services they provide, is a major driver of biodiversity loss on a global scale. In particular, the severe degradation of large rivers, their catchments, floodplains and lower estuarine reaches has been ongoing for many decades, and the consequences are evident across Europe. River restoration is a relatively recent tool that has been brought to bear in attempts to reverse the effects of habitat simplification and ecosystem degradation, with a surge of projects undertaken in the 1990s in Europe and elsewhere, mainly North America.

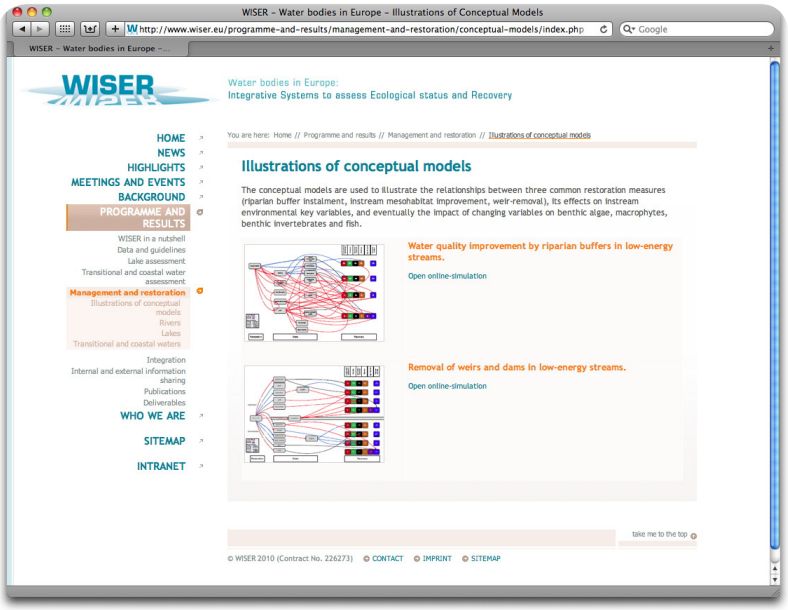
In their review, Feld and co-authors focussed on examples of restoration of the physical properties (e.g. substrate composition, bank and bed structure) of river ecosystems to ascertain what has, and what has not, been learned over the last 20 years. The authors focus on three common types of restoration measures–riparian buffer management, in-stream mesohabitat enhancement and the removal of weirs and small dams–to provide a structured overview of the literature. Thereby, they distinguish between abiotic effects of restoration (e.g. increasing habitat diversity) and biological recovery (e.g. responses of algae, macrophytes, macroinvertebrates and fishes).

Overall, the restoration literature revealed riparian buffer zones to reduced fine sediment entry, and also nutrient and pesticide inflows. Positive effects on stream assemblages were evident. Buffer width and length were key: 5–30 m width and >1 km length were most effective. The introduction of large woody debris, boulders and gravel were the most commonly used restoration measures, but the potential positive effects of such local habitat enhancement schemes were often likely to be swamped by larger-scale geomorphological and physico-chemical effects. Studies demonstrating long-term biological recovery due to habitat enhancement were notable by their absence. In contrast, weir removal can have clear beneficial effects, although biological recovery might lag behind for several years, as huge amounts of fine sediment may have accumulated upstream of the former barrier.

The general lack of knowledge derived from integrated, well-designed and long-term restoration schemes is striking and, therefore, Feld and co-authors presented a conceptual framework to help address this problem. The framework was applied to the three restoration types included in their study and highlights recurrent cause-effect chains, i.e. commonly observed relationships of restoration measures (cause) and their effects on abiotic and biotic conditions (effect). Such conceptual models can provide useful new tools for devising more effective river restoration, and for identifying avenues for future research in restoration ecology in general.

➲ Learn more about the conceptual models using the interactive web tools at http://www.wiser.eu/programme-and-results/management-and-restoration/conceptual-models/.

Christian K. Feld (UDE)



Interactive web tools for conceptual models

New features on www.freshwaterecology.info

WISER has contributed considerably to the European database on ecological information of freshwater organisms

As a result of the WISER work two new organism groups were added to the freshwaterecology.info database and website, namely macrophytes and phytoplankton. To facilitate standardised taxalists for the WISER surveys, the Taxa Entry Tool (TET) was developed and implemented in the website.

Now the next feature is ready for release: ecological characteristics of many European macrophytes were compiled and will be made available to the public in the near future. While the data are hosted and maintained by CEH, they will be accessible through www.freshwaterecology.info.

The following parameters are available:

- Lake macrophyte intercalibration metric (LMICM-Score): This score is a measure of the trophic status of lakes in which each taxon is found, and was developed by Nigel Willby from the University of Stirling, UK (Willby, NJ, in prep. 2011). It was used to create a common macrophyte lake metric for the Water Framework Directive Intercalibration exercise. The score has values between 0 and 10, where 0 is for plants found in oligotrophic lakes, and 10 for plants found in highly eutrophic lakes.
- Aquaticity-Score: This score was defined by CEMAGREF (Christian Chauvin) and is a measure of the degree to which each plant is dependent on an aquatic environment. The aquaticity score is divided into eight classes of increasing aquaticity, with a value of 1 for plants which are exclusively aquatic, and higher values for less dependence on water.
- Ellenberg-Score: The score is an earlier version of the LMICM-Score, developed in the late nineties (Hill et al. 1999) as a measure of nutritional preference of plants (especially the need for nitrogen), and can be used as another measure of trophic status. The score is divided into eight classes, where 1 is for plants with very low nutritional needs, and 8 for plants that only occur in nutrient-rich environments.
- Growth forms: For many species in the freshwaterecology.info list growth forms were defined by REBECCA and WISER project partners. The 13 different growth forms are lemnid, ceratophyllid, elodeid, isoetid, nympheid, helophyte, supralittoral, bryid, charid, chlorophyte, fern, lichen and terrestrial.

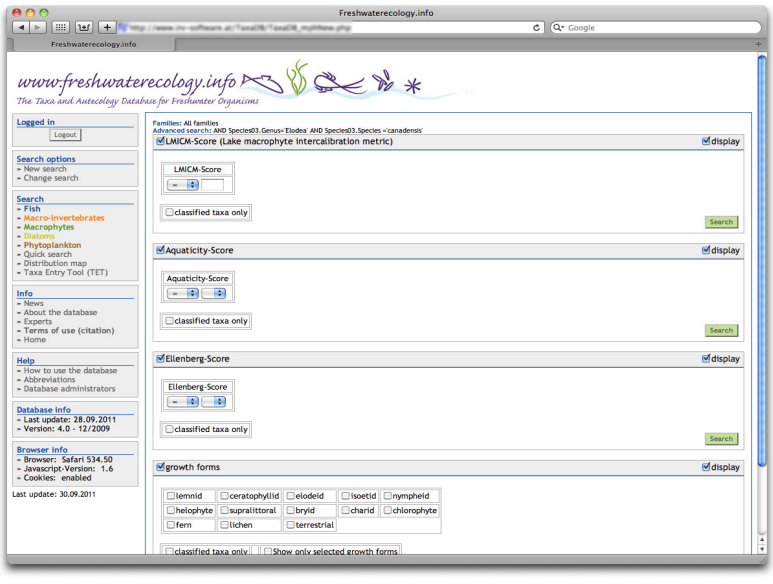
The webpage offers the possibility to query not only one ecological parameter but also two or more parameters at the same time. Parameters can be combined with an "or" – or an "and" – relation on the lower end of the site. To limit the output only those species that were assigned to a classification, the "classified taxa only" checkbox is on hand. All results come with according references to make data origin comprehensible.

Further, help is provided by tooltips: move your mouse over parameter names or result values and short explanations will be displayed. There is also a dedicated help section on the website that will help you with the query process, interpretation of results and explanations of abbreviations.

The new version of freshwaterecology.info will also include a csv-export to view and use data in Excel. This upcoming version will also provide a Taxa Validation Tool (TVT), which allows harmonising your own taxalist with the freshwaterecology.info taxonomy. More over it will be possible to add all/selected ecological parameters to this standardised list and export them for your own purposes and analyses.

We are always trying to improve the website and make it as user-friendly as possible. So we are happy to receive comments and feedback. Visit us at *www.freshwaterecology.info*, Version 5.0 will be launched online by mid October 2011.

Astrid Schmidt-Kloiber (BOKU)
Bernard Dudley (CEH)



Query ecological characteristics of European macrophytes

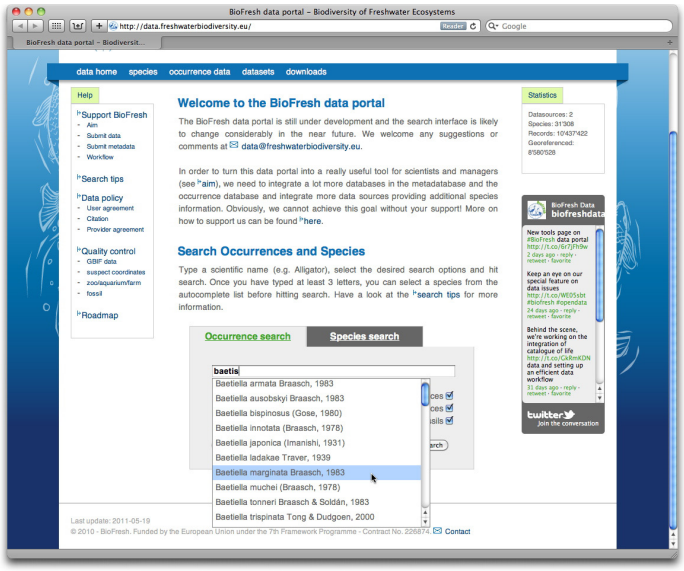
Introducing the BioFresh project – Integrating freshwater biodiversity data

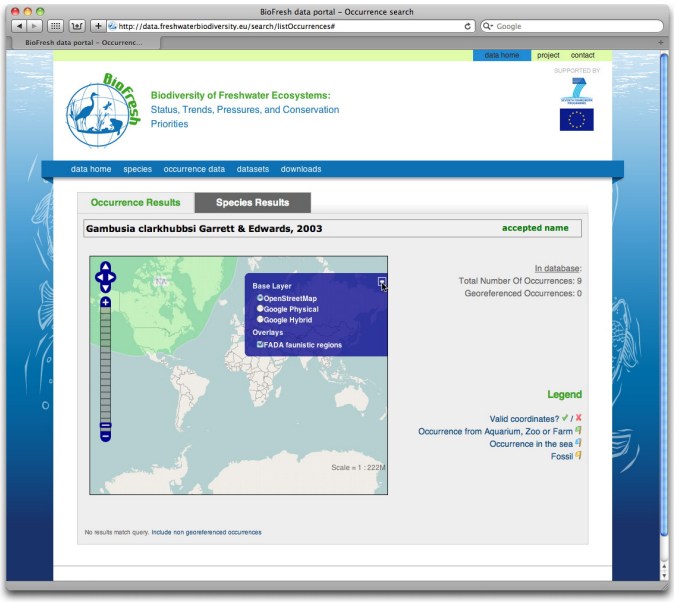
The BioFresh data portal taking shape

BioFresh, "Biodiversity of Freshwater Ecosystems: Status, Trends, Pressures, and Conservation Priorities", is a EU-funded international project, which integrates the freshwater biodiversity competencies and expertise of 18 research institutions (*http://www.freshwaterbiodiversity.eu/*). This project is building a global portal for scientists and ecosystem managers with access to all available databases describing the distribution, status and trends of freshwater biodiversity. The aim of the BioFresh data portal is to integrate and provide open and free access to this data and to serve as a data discovery tool, allowing scientists and managers to complement, integrate, and analyze distribution data to elucidate patterns in freshwater biodiversity.

After about one and a half year of development, the data portal at *http://data.freshwaterbiodiversity.eu/* is gradually taking shape. Our database currently holds over 10 million occurrence records for more than 31.000 species and the technology is in place to gradually improve both the database and the search interface. On the homepage (see screenshot), users can search for species or click the random button to view occurrence or species details. On the occurrence map, data from GBIF (*www.gbif.org*) are shown as clusters of points along with (a) shapefile(s) depicting the faunistic region from FADA (Freshwater Animal Diversity Assessment; *http://fada.biodiversity.be/*).

At this stage we are working behind the scene to include information from Catalogue of Life (*http://www.catalogueoflife.com/*).





Search species and display occurrence on a global map

Other developments in the pipeline are more advanced search options and a download capability.

We warmly welcome your comments and suggestions for the portal. In addition, BioFresh is constantly searching for freshwater biodiversity databases for both completing its metadatabase and for publishing the data on the BioFresh data portal.

For publishing data on the BioFresh portal or in the metadatabase: **data@freshwaterbiodiversity.eu**

Astrid Schmidt-Kloiber (BOKU)
Aaike De Wever (Royal Belgian Institute of Natural Sciences, RBINS, Belgium)

A cabinet of curiosities and the BioFresh blog

Amongst features advertising upcoming events and news as well as the progress of the project, the BioFresh website (*http://www.freshwaterbiodiversity.eu/*) offers two very special features:

The BioFresh Cabinet of Freshwater Curiosities (*http://cabinetoffreshwatercuriosities.com/*) intends to foster the wonder and curiosity into the often-neglected world of freshwater ecosystems. The cabinet collects and collates a selection of the world's most fascinating, bizarre and unique freshwater plants, animals and phenomena. It provides an interactive platform for users to engage with some little-known oddities and become further immersed in the curious world of freshwater ecosystems.

The BioFresh blog (*http://biofreshblog.wordpress.com/*) is a forum for BioFresh partners and invited contributors to discuss the science, policy and conservation of freshwater ecosystems alongside wider environmental issues. We are always keen to receive comments and suggestions for the blog, and happy to provide more information about BioFresh and wider freshwater biodiversity issues where requested.

Contact information:

For contributions to the cabinet of curiosities or the blog: **biofresh@ouce.ox.ac.uk**

Astrid Schmidt-Kloiber (BOKU)
Rob St.John (Oxford University Centre for the Environment, OUCE, Oxford, UK)

Impressions from the BioFresh cabinet and the blog, covering a wide range of topics

Data about data, the BioFresh metadatabase

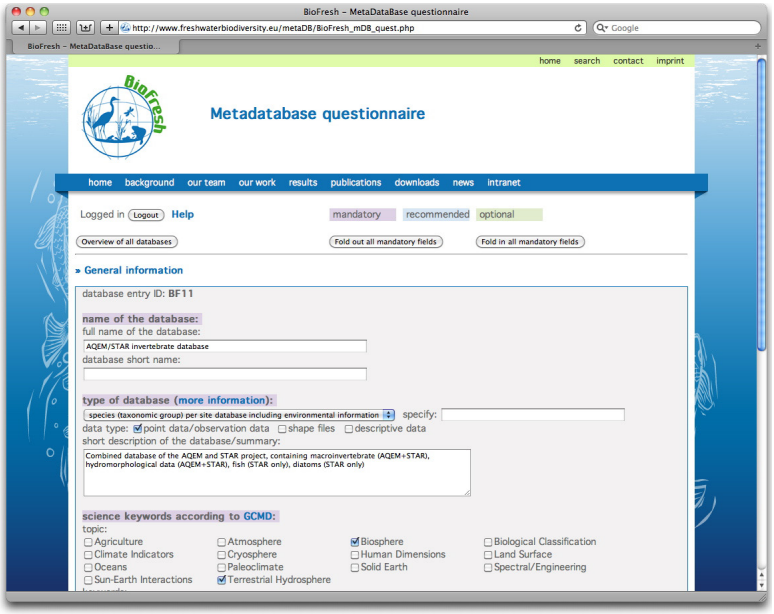
Along with the data for the portal, BioFresh also collects metadata, that means data characterising these datasets. The aim of this metadatabase (*http://www.freshwaterbiodiversity.eu/metadatabase*) is to bring all possible information on freshwater related databases together (even if the data are not published on the portal) and provide a resource where scientists, conservationists and policy makers can find databases relevant for their work.

The metadatabase currently offers extensive search functionalities (like a search tool or a full text search) for tracing of datasets as well as a questionnaire for entering metadata in a harmonised and user-friendly way.

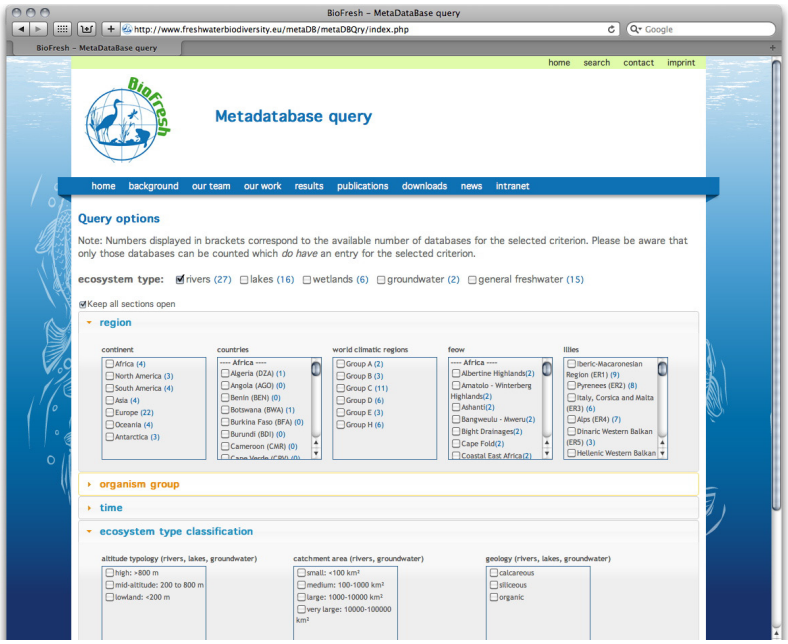
The BioFresh metadatabase offers the unique possibility to publish information about your dataset, to make it more visible to scientists and other interested persons. We put emphasis on the intellectual property rights of your dataset and take care that these are respected by users.

If you want to publish information about your dataset on our metadatabase, we are happy to assist the data entry process.

Astrid Schmidt-Kloiber (BOKU)
Aaike De Wever ((Royal Belgian Institute of Natural Sciences, RBINS, Belgium))



Metadata questionnaire



Metadatabase query with a wide range of parameters to search

List of the latest deliverables

D2.2-3: Manuscript comparing assessment approaches across ecosystem types, *Lead contractor: UDE*

D3.1-1: Report on lake phytoplankton composition metrics, including a common metric approach for use in intercalibration by all GIGs, *Lead contractor: NIVA*

D3.1-2: Report on phytoplankton bloom metrics, *Lead contractor: IGB*

D3.1-3: Uncertainty in lake phytoplankton metrics, *Lead contractor: CEH*

D3.2-2: Report on uncertainty in macrophyte metrics, *Lead contractor: NIVA*

D3.2-3: Report on the most suitable lake macrophyte based assessment methods for impacts of eutrophication and water level fluctuations, *Lead contractor: IEP*

D 3.3.-1: Overview of European lake types, their invertebrate fauna, persistence of reference conditions, and major pressures, *Lead contractor: FVB.IGB*

D3.3-2: The importance of invertebrate spatial and temporal variation for ecological status classification for European lakes, *Lead contractor: UNIROMA*

D3.3-3: Development of tools for the assessment of European lakes using benthic invertebrates: a preliminary analysis, *Lead contractor: UNIROMA and IGB*

D3.4-3: Guidelines for standardisation of hydroacoustic methods, *Lead contractor: NERC*

D4.1-2: Assessment of pigment data potential for multi-species and assemblage indices *Lead contractor: UDE*

D4.2-1: Review report/manuscript on seagrass indicator potential, *Lead contractor: CSIC – IMEDEA*

D5.2-1: Analysis of applied modeling approaches in the case studies, *Lead contractor: FEI*

D5.3-1: Temperature effects on hypoxia and benthic fauna, *Lead contractor: CSIC*

D5.3-2: Shifting reference conditions and boundaries for BQE indicators *Lead contractor: AU*

D6.1-1: Report on a workshop to bring together experts experienced with tool development and uncertainty estimation, *Lead contractor: CEH*

D6.1-3: WISERBUGS (WISER Bioassessment Uncertainty Guidance Software) tool for assessing confidence of WFD ecological status class *Lead contractor: BourneU*

D6.3-1: Report from a workshop on among BQEs, habitats and systems comparisons *Lead contractor: SLU*

6.4-1: Biological processes of connectivity and metapopulation dynamics in aquatic ecosystem restoration, *Lead contractor: Alterra*

D6.4-2: Report on the differences between cause-effect-recovery chains of different drivers within water categories, *Lead contractor: Alterra*

All WISER deliverables can be downloaded as PDFs from:

www.wiser.eu/programme-and-results/deliverables/