

Metadata describing the European Fish Index Plus (EFI+) database

Rafaela Schinegger , Florian Pletterbauer , Andreas Melcher  & Stefan Schmutz






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Metadata describing the European Fish Index Plus (EFI+) database

Rafaela Schinegger¹ , Florian Pletterbauer¹ , Andreas Melcher¹  & Stefan Schmutz¹

¹ Institute of Hydrobiology and Aquatic Ecosystem Management, Vienna, Austria; corresponding author: rafaela.schinegger@boku.ac.at

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Keywords

Fish assemblages, Human pressures, Water Framework Directive, Europe, Freshwater, Rivers, European Fish Index, Metrics, Environment, Research

Short description of the dataset/summary

The EFI+ database was derived within the EU-project "Improvement and Spatial extension of the European Fish Index (EFI+)". EFI+, an EU FP6 research project from 2007-2009 was designed to gain new knowledge and to further develop and improve new biological assessment methods to meet needs of the Water Framework Directive (WFD). The output of the project was a methodological approach to assess the ecological status of rivers in accordance with the WFD. Therefore the EFI+ project represents a direct and important contribution to the Water Framework Directive in further development and implementation of harmonised fish-based assessment tools and methodology that can be used as a standard method in EU Member States, as well as Candidate countries.

The overall objective of EFI+ was to overcome existing limitations of the European Fish Index (EFI) by developing a new, more accurate and pan-European fish index. The related database covers 15 European countries and contains 14 221 fish sampling sites.

General information

dataset entry ID:	BF15
name of the dataset:	
full name of the dataset:	EFI+ database
type of dataset:	species (taxonomic group) per site database including environmental information

data type: point data/observation data
science keywords according to GCMD:
topic: Biosphere, Biological Classification, Human Dimensions, Land Surface, Terrestrial Hydrosphere
ISO topic category according to ISO 19115:
Biota, Environment, Inland Waters
own science keywords: fish, rivers, pressure, human impact, ecological status, assessment

Technical and administrative specifications

data format: Access
operating system: all operating systems
data language: English
current access level: restricted access
currently available through [GBIF](#): no
exchange planned: no
data in data repository: no
Do you plan to publish the data on the Freshwater Biodiversity Data Portal:
yes
update level: completed
documentation:
type: manual, others/specify
others/details: deliverables of the EU project
language: English

contact details:

metadata contact person:
first, last name: Rafaela Schinegger
phone: +43 1 4765481223
email: rafaella.schinegger@boku.ac.at
institution: Institute of Hydrobiology and Aquatic Ecosystem Management
address: Max Emanuel-Strasse 17
postal code, city: 1180 Vienna
province, state: Vienna
country: Austria
web address: <http://www.wau.boku.ac.at/en/ihg/>

technical contact person:
first, last name: Andreas Melcher
phone: +43 1 4765481223
email: andreas.melcher@boku.ac.at

scientific contact person:
first, last name: Stefan Schmutz
phone: +43 1 4765481200
email: stefan.schmutz@boku.ac.at

comments: Acknowledgements are going to Florian Pletterbauer who integrated the EFI+ metadata into the Freshwater Biodiversity Data Portal and made data-requests with EFI+ partners about publishing absence/presence data of species.

Intellectual property rights and citation

dataset creator (data compiler):

contact name: EFI+ Consortium
 contact email: stefan.schmutz@boku.ac.at
 contact institution: Institute of Hydrobiology and Aquatic Ecosystem Management, University of Natural Resources and Life Sciences, Vienna

data contributors to/owners of this dataset:

multiple
 number: 22

data contributor/owner 1:

contact name: Andreas Melcher
 contact email: andreas.melcher@boku.ac.at
 contact institute: BOKU - University of Natural Resources and Life Sciences
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 2:

contact name: Uwe Braemick
 contact email: uwe.braemick@ifb-potsdam.de
 contact institute: Institut für Binnenfischerei e.V.
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 3:

contact name: Teppo Vehanen
 contact email: teppo.vehanen@rktl.fi
 contact institute: Finnish Game and Fisheries Research Institute
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 4:

contact name: Samuel Dembski
 contact email: samuel.dembski@onema.fr
 contact institute: ONEMA
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 5:

contact name: Giuseppe Maio
 contact email: maio@aquaprogram.it
 contact institute: Aquaprogram.s.r.l.
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 6:

contact name: Giuseppe Maio
 contact email: maio@aquaprogram.it
 contact institute: Parco Nazionale Dolomiti Bellunesi
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions

of use.

data contributor/owner 7:

contact name: Giuseppe Maio
contact email: maio@aquaprogram.it
contact institute: Provincia di Venezia
criteria for using this part of the dataset:

The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 8:

contact name: Giuseppe Maio
contact email: maio@aquaprogram.it
contact institute: Provincia di Verona
criteria for using this part of the dataset:

The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 9:

contact name: Giuseppe Maio
contact email: maio@aquaprogram.it
contact institute: Provincia di Vicenza
criteria for using this part of the dataset:

The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 10:

contact name: Tanja Berg
contact email: HFNaturschutzdaten@forst.hessen.de
contact institute: Hessen-Forst FENA
criteria for using this part of the dataset:

The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 11:

contact name: Diego Garcia de Jalon
contact email: diego.gjalon@upm.es
contact institute: Universidad Politécnic de Madrid
criteria for using this part of the dataset:

The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 12:

contact name: Bela Halasi-Kovacs
contact email: halasi1@t-online.hu
contact institute: Research Insitute for Fisheries Aquaculture and Irrigation
criteria for using this part of the dataset:

The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 13:

contact name: Richard Noble
contact email: r.a.noble@hull.ac.uk
contact institute: Hull University
criteria for using this part of the dataset:

The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 14:

contact name: Ian Cowx
 contact email: I.G.Cowx@hull.ac.uk
 contact institute: Hull University
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 15:

contact name: Karina Battes
 contact email: kbattes@yahoo.com
 contact institute: Bacau University
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 16:

contact name: Teresa Ferreira
 contact email: terferreira@isa.utl.pt
 contact institute: Instituto Superior de Agronomia
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 17:

contact name: Armin Peter
 contact email: armin.peter@eawag.ch
 contact institute: eawag
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 18:

contact name: Tom Buijse
 contact email: tom.buijse@deltares.nl
 contact institute: Deltares
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions of use.

data contributor/owner 19:

contact name: Graeme Peirson
 contact email: graeme.peirson@environment-agency.gov.uk
 contact institute: Environment Agency UK
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions of use.
 other/additional criteria: Acknowledge the source of the information by including the following attribution statement: "Contains Environment Agency information of Environment Agency and database rights."

data contributor/owner 20:

contact name: Tomas Virbickas
 contact email: tvirbickas@takas.lt
 contact institute: Nature Research Centre
 criteria for using this part of the dataset:
 The dataset needs to be requested from dataset creator with specific conditions

of use.

data contributor/owner 21:

contact name: Piotr Debowski
 contact email: pdebow@infish.com.pl
 contact institute: Inland Fisheries Institute in Olsztyn
 criteria for using this part of the dataset:

The dataset needs to be requested from dataset creator with specific conditions of use.

comments: Polish fish data were delivered to the Freshwater Biodiversity Data Portal through a BioFresh contingency fund project compiled by J. Kotusz (dataset "BF_CF8").

data contributor/owner 22:

contact name: Patrick Bohman
 contact email: patrik.bohman@slu.se
 contact institute: Institute of Freshwater Research- Swedish Board of Fisheries
 criteria for using this part of the dataset:

The dataset needs to be requested from dataset creator with specific conditions of use.

comments: Data belongs to the Swedish Agency for Marine and Water Management which did not give any response to the data approval.

citation of this dataset:

author(s): EFI+ Consortium
 title and journal (name, number, pages):

Central database EFI+. Improvement and spatial extension of the European Fish Index. <http://efi-plus.boku.ac.at/>

year: 2009

citation of the metadata:

author(s): Schinegger R., Pletterbauer F., Melcher A. & Schmutz S.
 title and journal (name, number, pages):

Metadata describing the European Fish Index Plus (EFI+) database. *Freshwater Metadata Journal* 0: 0-0

year: 0000

doi: <https://doi.org/10.15504/fmj.0000.0>

dataset related references:

reference 1:

author(s): Logez, M. & Pont, D.
 title: Development of metrics based on fish body size and species traits to assess European coldwater streams. *Ecological Indicators* 11(5), 1204-1215.
 year: 2011
 doi: <https://doi.org/10.1016/j.ecolind.2010.12.023>

reference 2:

author(s): Logez, M. & Pont, D.
 title: Global warming and potential shift in reference conditions: the case of functional fish-based metrics. *Hydrobiologia* 704, 417-436.
 year: 2012
 doi: <https://doi.org/10.1007/s10750-012-1250-6>

reference 3:

author(s): Logez, M., Bady, P. & Pont, D.
 title: Modelling the habitat requirement of riverine fish species at the European scale: sensitivity to temperature and precipitation and associated uncertainty. *Ecology*

- of Freshwater Fish 21(2), 266-282.
- year: 2012
doi: <https://doi.org/10.1111/j.1600-0633.2011.00545.x>
- reference 4:
author(s): Logez, M., Bady, P., Melcher, A. & Pont, D.
title: A continental-scale analysis of fish assemblage functional structure in European rivers. *Ecography* 36(1), 80-91.
- year: 2013
doi: <https://doi.org/10.1111/j.1600-0587.2012.07447.x>
- reference 5:
author(s): Segurado, P., Santos, J. M., Pont, D., Melcher, A. H., Jalon, D. G., Hughes, R. M. & Ferreira, M. T.
title: Estimating species tolerance to human perturbation: Expert judgment versus empirical approaches. *Ecological Indicators* 11(6), 1623-1635.
- year: 2011
doi: <https://doi.org/10.1016/j.ecolind.2011.04.006>
- reference 6:
author(s): Schinegger, R., Trautwein, C., Melcher, A. & Schmutz, S.
title: Multiple human pressures and their spatial patterns in European running waters. *Water and Environment Journal* 26(2), 261-273.
- year: 2012
doi: <https://doi.org/10.1111/j.1747-6593.2011.00285.x>
- reference 7:
author(s): Schinegger, R., Trautwein, C., & Schmutz, S.
title: Pressure-specific and multiple pressure response of fish assemblages in European running waters. *Limnologia* 43(5), 348-361.
- year: 2013
doi: <https://doi.org/10.1016/j.limno.2013.05.008>
- reference 8:
author(s): Trautwein, C., Schinegger, R., & Schmutz, S.
title: Divergent reaction of fish metrics to human pressures in fish assemblage types in Europe. *Hydrobiologia* 718(1), 207-220.
- year: 2013
doi: <https://doi.org/10.1007/s10750-013-1616-4>
- reference 9:
author(s): Pletterbauer F., Melcher A.H., Ferreira T., & Schmutz S.
title: Impact of climate change on the structure of fish assemblages in European rivers. *Hydrobiologia*, 744, 235-254.
- year: 2015
doi: <https://doi.org/10.1007/s10750-014-2079-y>
- comments:** IHG/BOKU was lead partner of the EFI+-project. Due to the complicated structure of intellectual property rights (data was not sampled during the project but gathered through national institutions) BOKU performed a data approval call among all former project partners to approve data to be published through the Freshwater Biodiversity Data Portal (BioFresh). In this list of database providers only those are mentioned who approved data for the BioFresh data portal.

General data specifications

regional coverage of the dataset:

spatial extent of the dataset: continental
 continents: Europe

spatial extent (bounding coordinates):

southernmost latitude [°]: -6,277242
 northernmost latitude [°]: 69,248759
 westernmost longitude [°]: -9,2441597
 easternmost longitude [°]: 42,045440
 minimum altitude: -4 metres
 maximum altitude: 2183 metres
 countries: Europe: Austria, Belgium, Finland, France, Germany, Hungary, Italy, Lithuania, Netherlands, Poland, Portugal, Romania, Spain, Switzerland, United Kingdom

world climatic regions according to [Köppen](#):

Group C: temperate/mesothermal climates
 Group H: alpine climates

freshwater ecoregions of the world (FEOW) according to [WWF](#):

Europe: Cantabric Coast - Languedoc, Central & Western Europe, Dniester - Lower Danube, Eastern Iberia, Gulf of Venice Drainages, Italian Peninsula & Islands, Northern Baltic Drainages, Northern British Isles, Southern Baltic Lowlands, Southern Iberia, Upper Danube, Western Iberia

European ecoregions according to [Illies \(WFD\)](#):

Iberic-Macaronesian Region (ER1), Pyrenees (ER2), Italy, Corsica and Malta (ER3), Alps (ER4), Western Highlands (ER8), Central Highlands (ER9), The Carpathians (ER10), Hungarian Lowlands (ER11), Pontic Province (ER12), Western Plains (ER13), Central Plains (ER14), Baltic Province (ER15), Eastern Plains (ER16), Great Britain (ER18), Fenno-Scandian Shield (ER22)

ecosystem type:

rivers

covered timeframe:

1955 - 2007

Site specifications

coordinate system/grid data:

latitude/longitude, format: DD
 datum (e.g. WGS84): WGS84
 grid data available: no

ecosystem type classification:

rivers (classification according to WFD):

altitude typology

high: > 800 m, mid-altitude: 200 - 800 m, lowland: < 200 m

exact altitudinal data available

size typology based on catchment area

small: < 100 km², medium: 100 - 1000 km², large: 1000 - 10000 km², very large: 10000 - 100000 km²

exact catchment size data available

geology

calcareous, siliceous, organic

site coding available:

yes, alphanumerical

example:

CH_000596

number of sites:

>1000

exact number of sites: 14221

Climate and environmental data

climate related data:

spatial resolution of the data (if not catchment/site related):

1 km

available parameters per site:

mean annual temperature January, July

data source: worldclim.org

mean annual temperature for each month

data source: worldclim.org

mean annual precipitation

data source: worldclim.org

environmental data:

available parameters per catchment:

catchment size

data source: CCM river network

catchment geology

data source: expert judgement, national data

catchment land cover/land use

data source: CORINE2000

population density

data source: European Environment Agency

presence of barriers/dams/reservoirs (fragmentation)

data source: expert judgement, national data

hydrological regime/flow regime

data source: expert judgement, national data

available parameters per site:

catchment land use upstream of sampling site

data source: CORINE2000

information on riparian vegetation (incl. information on modification)

data source: expert judgement, national data

information on embankment (incl. information on modification)

data source: expert judgement, national data

information on channel form (incl. information on modification)

data source: expert judgement, national data

information on cross section (incl. information on modification)

data source: expert judgement, national data

information on water uses (e.g., irrigation, fish ponds)

data source: expert judgement, national data

distance to next migration barrier upstream

data source: expert judgement, national data

distance to next migration barrier downstream

data source: expert judgement, national data

distance to source

data source: CCM river network

distance to mouth

data source: CCM river network

stream order (according to Strahler)

data source: CCM river network

slope

data source: CCM river network

altitude

data source: CCM river network

hydrological regime/flow regime

data source: expert judgement, national data

wetted width

data source: expert judgement, national data

substrate composition

data source: expert judgement, national data

information on instream habitat (incl. information on modification)

data source: expert judgement, national data

conductivity, substrate

physico-chemical data:

other physico-chemical parameters:

Categorical information about:

- Toxic priority substances (organic and nutrient appearance): 3 classes
- National water quality index: 5 classes
- Eutrophication: no, low, intermediate (occurrence of green algae), extreme (oxygen depletion, increase of primary production)
- Organic pollution: 3 classes
- Organic siltation: yes/no

availability of physico-chemical data, if there is more than one sample per site:

per sample

stressors influencing the sites:

reference sites available: yes

stressor	restored sites available	data before/after restoration available	stressor gradient available	comments
eutrophication	no	no	yes	
hydromorphological degradation	no	no	yes	
acidification	no	no	yes	
organic pollution	no	no	yes	
toxic stress	no	no	yes	
general degradation	no	no	yes	
hydrologic stress (e.g. impoundment, flow velocity reduction, hydropeaking, water abstraction, flow velocity increase, etc.)	no	no	yes	

Biological data

biological data origin: general compilation,
data provided by partner institutions

organism group addressed: fish

Sample specifications/sample resolution**fish:****sample information:**

covered timeframe: 1955 - 2007

historical data: no

palaeo data: no

season: spring, summer, autumn, winter

temporal resolution/frequency of sampling:
Single sampling, partially yearly data

time series data: no

taxonomic resolution:

level: family, genus, species

percentage of species level data: 100

taxonomic coding:

taxalist according to: FishBase

reference(s): Froese, R. & Pauly, D. (editors), 2016. FishBase. World Wide Web electronic publication. www.fishbase.org.

sample specifications:

type: quantitative (abundance data)

replicate samples: yes

number of samples: 164947

specification of method(s) used for sampling and sorting:
electro fishing

reference(s): CEN

sample type (e.g. habitat specific samples, composite samples etc.):
composite samples

Other specifications**GIS layers, shape files related to the dataset:**

species distribution

catchments, river-sub-basins

land use

dams/reservoirs/barriers

environmental variables (freshwater or terrestrial)

climatic variables (current and predictions)

availability of photos: no

availability of maps: no

quality control procedures:

Were any quality control procedures applied to your dataset?

yes

quality control protocols and comments:

Data mining and data screening within WP 2 of EFI+

reference(s):

http://efi-plus.boku.ac.at/downloads/EFI+%200044096%20Deliverable%20D2_1-2_2.pdf

Acknowledgements

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References

- Froese, R. & Pauly, D. (editors), 2016. FishBase. World Wide Web electronic publication. www.fishbase.org.
- Logez, M. & Pont, D., 2011. Development of metrics based on fish body size and species traits to assess European coldwater streams. *Ecological Indicators* 11(5), 1204-1215. <https://doi.org/10.1016/j.ecolind.2010.12.023>
- Logez, M. & Pont, D., 2012. Global warming and potential shift in reference conditions: the case of functional fish-based metrics. *Hydrobiologia* 704, 417-436. <https://doi.org/10.1007/s10750-012-1250-6>
- Logez, M., Bady, P. & Pont, D., 2012. Modelling the habitat requirement of riverine fish species at the European scale: sensitivity to temperature and precipitation and associated uncertainty. *Ecology of Freshwater Fish* 21(2), 266-282. <https://doi.org/10.1111/j.1600-0633.2011.00545.x>
- Logez, M., Bady, P., Melcher, A. & Pont, D., 2013. A continental-scale analysis of fish assemblage functional structure in European rivers. *Ecography* 36(1), 80-91. <https://doi.org/10.1111/j.1600-0587.2012.07447.x>
- Pletterbauer F., Melcher A.H., Ferreira T. & Schmutz S., 2015. Impact of climate change on the structure of fish assemblages in European rivers. *Hydrobiologia*, 744, 235-254. <https://doi.org/10.1007/s10750-014-2079-y>
- Schinegger, R., Trautwein, C. & Schmutz, S., 2013. Pressure-specific and multiple pressure response of fish assemblages in European running waters. *Limnologica* 43(5), 348-361. <https://doi.org/10.1016/j.limno.2013.05.008>
- Schinegger, R., Trautwein, C., Melcher, A. & Schmutz, S., 2012. Multiple human pressures and their spatial patterns in European running waters. *Water and Environment Journal* 26(2), 261-273. <https://doi.org/10.1111/j.1747-6593.2011.00285.x>
- Segurado, P., Santos, J.M., Pont, D., Melcher, A.H., Jalon, D.G., Hughes, R.M. & Ferreira, M.T., 2011. Estimating species tolerance to human perturbation: Expert judgment versus empirical approaches. *Ecological Indicators* 11(6), 1623-1635. <https://doi.org/10.1016/j.ecolind.2011.04.006>
- Trautwein, C., Schinegger, R. & Schmutz, S., 2013. Divergent reaction of fish metrics to human pressures in fish assemblage types in Europe. *Hydrobiologia* 718(1), 207-220. <https://doi.org/10.1007/s10750-013-1616-4>