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

Rafaela Schinegger, Florian Pletterbauer, Andreas Melcher & Stefan Schmutz
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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: | EFI+ database |
| full name of the dataset: | species (taxonomic group) per site database including environmental information |
| type of dataset: | point data/observation data |
science keywords according to GCMD:

- topic: Biosphere, Biological Classification, Human Dimensions, Land Surface, Terrestrial Hydrosphere
- keywords: fish, rivers, pressure, human impact, ecological status, assessment

ISO topic category according to ISO 19115:

- Biota, Environment, Inland Waters

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
media for data delivery: online FTP, e-mail
web address: http://efi-plus.boku.ac.at/index.htm
comments: An approved sub-set of the data are published as presence data in the Freshwater Biodiversity Data Portal. Another approved list of selected sampling sites with EFI+ scores and pressure information is available via the EFI+ website.

update level: completed
documentation:
type: manual, others/specify
language: English
others/details: deliverables of the EU project

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

  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: HFNatschutzdaten@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 Politécnica 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 Institute 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
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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: 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 17: 1-12
year: 2016
doi: http://dx.doi.org/10.15504/fmj.2016.17
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
reference 2:
author(s): Logez, M. & Pont, D.
year: 2012
doi: 10.1007/s10750-012-1250-6
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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: 10.1111/j.1600-0633.2011.00545.x

reference 4:
  author(s): Logez, M., Bady, P., Melcher, A. & Pont, D.
  year: 2013

reference 5:
  author(s): Segurado, P., Santos, J. M., Pont, D., Melcher, A. H., Jalon, D. G., Hughes, R. M. & Ferreira, M. T.
  year: 2011

reference 6:
  author(s): Schinegger, R., Trautwein, C., Melcher, A. & Schmutz, S.
  year: 2012

reference 7:
  author(s): Schinegger, R., Trautwein, C., & Schmutz, S.
  year: 2013
  doi: 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

reference 9:
  author(s): Pletterbauer F., Melcher A.H., Ferreira T., & Schmutz S.
  year: 2015
  doi: 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:
  scale of the dataset: continental

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 to 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:
  exact number of sites: 14221
  >1000
Climate and environmental data

climatic 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
physico-chemistry data:
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
physico-chemistry data:
conductivity, substrate
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:
<table>
<thead>
<tr>
<th>stressor</th>
<th>restored sites available</th>
<th>data before/after restoration available</th>
<th>stressor gradient available</th>
<th>comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>eutrophication</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>hydromorphological degradation</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>acidification</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>organic pollution</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>toxic stress</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>general degradation</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td></td>
</tr>
<tr>
<td>hydrologic stress (e.g. impoundment, flow velocity reduction, hydropoaking, water abstraction, flow velocity increase)</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td></td>
</tr>
</tbody>
</table>
Biological data
biological data origin: general compilation
specify method: 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

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, shapes 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: http://efi-plus.boku.ac.at/downloads/EFI+%20D2_1-2_2.pdf
Acknowledgements
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References