

Metadata: MARS multiple stressors and biological dataset of Drava & Mura Basins

Rafaela Schinegger, Christiane Aschauer, Helena Mühlmann & Stefan Schmutz



Freshwater Metadata Journal
DOI 10.15504/fmj.2017.24
ISSN 2312-6604
Published online: 2017-08-17



*Published by University of Natural Resources and
Life Sciences, Institute of Hydrobiology and
Aquatic Ecosystem Management, BOKU - Vienna*

Metadata: MARS multiple stressors and biological dataset of Drava & Mura Basins

Rafaela Schinegger¹, Christiane Aschauer², Helena Mühlmann¹ & Stefan Schmutz¹

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

² Austrian Federal Ministry of Agriculture, Forestry, Environment & Water Management, Vienna, Austria

Please cite this paper as follows: Schinegger R., Aschauer C., Mühlmann H. & Schmutz S., 2017. Metadata: MARS multiple stressors and biological dataset of Drava & Mura Basins. Freshwater Metadata Journal 24: 1-8. <https://doi.org/10.15504/fmj.2017.24>

Received: 2016-05-03 / Published: 2017-08-17

Keywords

Water Framework Directive, Stressors, Fish Assemblages, Fish Index Austria, Drava Basin, Mura Basin, Impacts, Ecological Status, Hydromorphology, MARS Project

Short description of the dataset/summary

This work/dataset addresses human stressors and their impacts on fish assemblages in the Austrian Drava and Mura River Basins. It supports the EU-project MARS (Managing Aquatic ecosystems and water Resources under multiple Stress) by analysing single and multiple stressors, environmental effects and stressor combinations/interactions. Data sources are mainly shape files and MS ACCESS databases.

With the help of point data on connectivity disruptions (barriers) and line data on hydromorphological & water quality stressors (on water body level), six mainly hydromorphological stressors from the national inventory assessment of the EU Water Framework Directive were recoded and aggregated into new variables, i.e. stressor metrics. These then were compared with point data (fish sampling sites) and related information on fish assemblages (Fish Index Austria and related single metrics as well as the WFD biological and total status).

General information

dataset entry ID:	MARS_01
name of the dataset:	
full name of the dataset:	Metadata: MARS multiple stressors and biological dataset of Drava & Mura Basins
dataset short name:	MARS DRAVA/MURA stressors and biological dataset
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, Terrestrial Hydrosphere
 keywords: Fish assemblages, metrics, rivers, stressors, impacts, ecological status, Water Framework Directive, Fish Index Austria, hydromorphological alterations, barriers

ISO topic category according to [ISO 19115](#):

Biota, Environment, Inland Waters

Technical and administrative specifications

data format: others/specify
 others/details: shapefiles and MS ACCESS database
operating system: all operating systems
data language: German
current access level: restricted access
 web address (URL): <http://www.bmlfuw.gv.at/en.html>
 others/details: River Basin Management Data are public data, but have to be requested from the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (see comment below).
 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:

no
 comments: River Basin Management Data (including stressor information and biological quality element monitoring sites) are public data, but have to be requested from the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (see <http://www.bmlfuw.gv.at/en.html>).
 The same applies for data on the Fish Index Austria, which have to be requested from the Institute for Water Ecology, Fish Biology and Lake Ecology (IGF; see <http://www.baw.at/index.php/igf-home.html>).

update level: update planned
 others/details: River Basin Management Plan data from 2009 and 2015 available (2015 only as draft), next planning circle will be finished in 2021

documentation:
 type: others/specify
 language: German
 others/details: <http://wisa.bmlfuw.gv.at>

contact details:

metadata contact person:
 first, last name: Helena M^Ahlmann
 phone: +43 1 71100 7158
 email: helena.muehlmann@bmlfuw.gv.at
 institution: Austrian Federal Ministry of Agriculture, Forestry, Environment & Water Management
 address: Marxergasse 2
 postal code, city: 1030 Vienna
 province, state: Vienna
 country: Austria

web address: <http://www.bmlfuw.gv.at/en.html>

technical contact person:

first, last name: Helena M^Ahlmann

phone: +43 1 71100 7158

email: helena.muehlmann@bmlfuw.gv.at

institution: Austrian Federal Ministry of Agriculture, Forestry, Environment & Water Management

address: Marxergasse 2

postal code, city: 1030 Vienna

country: Austria

web address: <http://www.bmlfuw.gv.at/en.html>

scientific contact person:

first, last name: Rafaela Schinegger

phone: +43 1 47654 81216

email: rafaela.schinegger@boku.ac.at

institution: Institute of Hydrobiology and Aquatic Ecosystem Management, BOKU Vienna

address: Gregor Mendel Straße 33

postal code, city: 1180 Vienna

country: Austria

web address: <https://www.boku.ac.at/en/personen/person/46C937474D6EB1AB/>

Intellectual property rights and citation

dataset creator (data compiler):

contact name: Rafaela Schinegger

contact email: rafaela.schinegger@boku.ac.at

contact institution: Institute of Hydrobiology and Aquatic Ecosystem Management (IHG)

data contributors to/owners of this dataset:

multiple

number: 2

data contributor/owner 1:

contact name: Helena Mühlmann

contact email: helena.muehlmann@bmlfuw.gv.at

contact institute: Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management

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: Brigitte Sasano

contact email: brigitte.sasano@baw.at

contact institute: Institute for Water Ecology, Fish Biology and Lake Ecology (IGF) Scharfling

criteria for using this part of the dataset:

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

citation of this dataset:

author(s): Schinegger, R., Aschauer, C., Mühlmann, H., Schmutz, S.

title: MARS stressor and biological dataset on Drava & Mura River Basins (Austria)

year: 2016

citation of the metadata:

author(s): Schinegger R., Aschauer C., Mühlmann H. & Schmutz S.
 title and journal (name, number, pages): Metadata: MARS multiple stressors and biological dataset of Drava & Mura Basins. Freshwater Metadata Journal 24: 1-8
 year: 2017
 doi: <https://doi.org/10.15504/fmj.2017.24>

dataset related references:

reference 1:

author(s): BMLFUW - Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft
 title: Nationaler Gewässerbewirtschaftungsplan 2015 - Entwurf.
<http://wisa.bmlfuw.gv.at/fachinformation/ngp/ngp-2015.html>
 year: 2015

reference 2:

author(s): BMLFUW - Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft
 title: Nationaler Gewässerbewirtschaftungsplan 2009 - NGP 2009
 (BMLFUW-UW.4.1.2/0011-I/4/2010)
https://www.bmlfuw.gv.at/wasser/wasser-oesterreich/plan_gewaesser_ngp/nationaler_gewaesserbewirtschaftungsplan-ngp.html
 year: 2010

General data specifications**regional coverage of the dataset:**

scale of the dataset: regional
 continents: Europe

spatial extent (bounding coordinates):

southernmost latitude [°]: 46.6408
 northernmost latitude [°]: 46.76153
 westernmost longitude [°]: 12.92196
 easternmost longitude [°]: 14.94884
 minimum altitude: 237 metres
 maximum altitude: 3798 metres
 countries: Europe: Austria
 comments: Environmental information based on entire Drava/Mura basins in Austria.

world climatic regions according to Köppen:

Group H: alpine climates
 freshwater ecoregions of the world (FEOW) according to [WWF](#):
 Europe: Central & Western Europe

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

Alps (ER4), Dinaric Western Balkan (ER5)

ecosystem type:

rivers

covered timeframe:

2006 - 2015

comments:

Timeframe of biotic data 2006-2014, abiotic/stressor data from Austrian River Basin Management Plans 2009 and 2015.

Site specifications

coordinate system/grid data:	latitude/longitude, format: DD projected, local others: MGI Lambert
datum (e.g. WGS84):	31287
grid data available:	no
ecosystem type classification:	
rivers (classification according to WFD):	altitude typology high: >800 m, mid-altitude: 200 to 800 m exact altitudinal data available size typology based on catchment area small: <100 km ² , medium: 100-1000 km ² exact catchment size data available geology calcareous, siliceous
site coding:	
site coding available:	yes, alphanumerical
number of digits:	9
example:	ATDRAU738
number of sites:	100 - 1000
exact number of sites:	525

Climate and environmental data

climate related data:	no data available
environmental data:	
available parameters per catchment:	catchment size data source: IHG database presence of barriers/dams/reservoirs (fragmentation) data source: River Basin Management Plans 2009 & 2015 hydrological regime/flow regime data source: River Basin Management Plans 2009 & 2015
available parameters per site:	information on embankment (incl. information on modification) data source: River Basin Management Plans 2009 & 2015 information on channel form (incl. information on modification) data source: River Basin Management Plans 2009 & 2015 information on cross section (incl. information on modification) data source: River Basin Management Plans 2009 & 2015 information on water uses (e.g., irrigation, fish ponds) data source: River Basin Management Plans 2009 & 2015 distance to next migration barrier upstream data source: River Basin Management Plans 2009 & 2015 distance to next migration barrier downstream data source: River Basin Management Plans 2009 & 2015 distance to the next lake upstream data source: River Basin Management Plans 2009 & 2015 river length data source: River Basin Management Plans 2009 & 2015

distance to source

data source: River Basin Management Plans 2009 & 2015

distance to mouth

data source: River Basin Management Plans 2009 & 2015

stream order (according to Strahler)

data source: River Basin Management Plans 2009 & 2015

slope

data source: IHG database

altitude

data source: IHG database

hydrological regime/flow regime

data source: River Basin Management Plans 2009 & 2015

information on instream habitat (incl. information on modification)

data source: River Basin Management Plans 2009 & 2015

physico-chemistry data:

other physico-chemical parameters:

Chemical status available from River Basin Management Plans 2009 & 2015.

Toxic substances available from River Basin Management Plans 2009 & 2015.

comments:

Detailed physico-chemistry data available upon request from the Federal Ministry of Agriculture, Forestry, Environment and Water Management.

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	chemical status (WFD)
hydromorphological degradation	no	no	yes	hydromorphological status (WFD)
organic pollution	no	no	yes	chemical status (WFD)
toxic stress	no	no	no	toxic substances (WFD)
general degradation	no	no	yes	measured via ecological status (WFD)
hydrologic stress (e.g. impoundment, flow velocity reduction, hydropeaking, water abstraction, flow velocity increase)	no	no	yes	residual flow, hydropeaking, impoundments (WFD)

comments:

Various restoration studies in Upper Drava catchment conducted in the last 20 years, see <http://www.life-drau.at> and

Martina Humpel (2012): Metaanalyse von Eingriffen und deren

Restaurationsmaßnahmen an der österreichischen Drau. Diplomarbeit /

Masterarbeit - Institut für Hydrobiologie, Gewässermanagement (IHG),

BOKU-Universität für Bodenkultur, pp 189.

<http://permalink.obvsg.at/bok/AC08907751>

Biological data

biological data origin:	from sampling
specify project:	"Fish Database Austria" (FDBA, 2015), which is managed by the Institute for Water Ecology, Fish Biology and Lake Ecology (IGF) of the Federal Office of Water Management (BAW)
organism group addressed:	fish
comments:	http://www.baw.at/index.php/igf-leistungen/fischdatenbank.html

Sample specifications/sample resolution

fish:

sample information:

covered timeframe:	2006 - 2014
historical data:	no
palaeo data:	no
season:	spring, summer, autumn, winter
temporal resolution/frequency of sampling:	single date
time series data:	no

taxonomic resolution:

level:	family, genus, species
percentage of species level data:	100

taxonomic coding:

taxalist according to:	Leitbildkatalog (BAW IGF, 2015)
reference(s):	http://www.baw.at/index.php/igf-download/1693-leitbildkatalog.html
coding system:	full latin name
example:	Thymallus thymallus

sample specifications:

type:	quantitative (abundance data)
replicate samples:	yes
number of samples:	525
specification of method(s) used for sampling and sorting:	electro fishing, wading
reference(s):	Haunschmid, R., Schotzko, N., Petz-Glechner, R., Honsig-Erlenburg, W., Schmutz, S., Spindler, T., Unfer, G., Wolfram, G., Bammer, V., Hundritsch, L., Prinz, H., Sasano, B. (2010). Leitfaden zur Erhebung der biologischen Qualitätselemente Teil A1 - Fische. Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, Wien. ISBN: 978-3-85174-059-2 http://www.baw.at/index.php/igf-download/1694-leitfaden-zur-erhebung-der-biologischen-qualitaets-elemente-teil-a1-fische.html
comments:	The fish based indicators include the Fish Index Austria (FIA) and its single metrics, an IBI that was developed for the assessment of the fish-ecological status in Austria according to the WFD needs. The FIA is composed of a number of core metrics. They include number of dominant species, number of subdominant species, number of rare species, number of habitat guilds (rheophilic, limnophilic, indifferent), number of reproductive guilds (lithophilic, phytophilic, psammophilic), fish region index and population age structure of dominant and subdominant species.

Other specifications

GIS layers, shapes related to the dataset:

catchments, river-sub-basins
dams/reservoirs/barriers
environmental variables (freshwater or terrestrial)

availability of photos:

no

availability of maps:

yes

quality control procedures:

Were any quality control procedures applied to your dataset?

yes

quality control protocols and comments:

Datasets were screened and data mining was conducted within a related master thesis and within MARS WP 4 Drava basin analyses.

reference:

Aschauer, C. (2016): Distribution and patterns of multiple human stressors and their impacts on fish assemblages in the Austrian Drava and Mura River Basins. Master thesis, University of Natural Resources and Life Sciences, Vienna.

Acknowledgements

Sincere thanks go to the Institute for Water Ecology, Fish Biology and Lake Ecology (IGF) Scharfling, especially to Brigitte Sasano and Reinhard Haunschmid for providing Fish Index Austria data. This work was funded by the MARS project (Managing Aquatic ecosystems and water Resources under multiple Stress), funded by the European Union under the 7th Framework Programme, contract no. 603378. Finally, we are thankful to our colleague Astrid Schmidt-Kloiber for screening the metadata, for her helpful comments and for her patience regarding the publishing of this metadataset.

References

- Aschauer, C., 2016. Distribution and patterns of multiple human stressors and their impacts on fish assemblages in the Austrian Drava and Mura River Basins. Master thesis, University of Natural Resources and Life Sciences, Vienna.
- BMLFUW - Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, 2010. Nationaler Gewässerbewirtschaftungsplan 2009 - NGP 2009 (BMLFUW-UW.4.1.2/0011-I/4/2010)
https://www.bmlfuw.gv.at/wasser/wasser-oesterreich/plan_gewaesser_ngp/nationaler_gewaesserbewirtschaftungsplan-ngp/ngp.html
- BMLFUW - Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, 2015. Nationaler Gewässerbewirtschaftungsplan 2015 - Entwurf. <http://wisa.bmlfuw.gv.at/fachinformation/ngp/ngp-2015.html>
- Haunschmid, R., Schotzko, N., Petz-Glechner, R., Honsig-Erlenburg, W., Schmutz, S., Spindler, T., Unfer, G., Wolfram, G., Bammer, V., Hundritsch, L., Prinz, H., Sasano, B., 2010. Leitfaden zur Erhebung der biologischen Qualitätselemente Teil A1 - Fische. Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, Wien. ISBN: 978-3-85174-059-2
- Humpel, M., 2012. Metaanalyse von Eingriffen und deren Restaurationsmaßnahmen an der österreichischen Draa. Diplomarbeit / Masterarbeit - Institut für Hydrobiologie, Gewässermanagement (IHG), BOKU-Universität für Bodenkultur, pp 189. <http://permalink.obvsg.at/bok/AC08907751>