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Metadata to the MOSAIC database on monitoring of small waters for aquatic invertebrates and agrochemicals

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Keywords

farmland ponds, insect monitoring, invertebrate monitoring, kettle holes, pesticide monitoring, prairie potholes, species distribution, water quality

Short description of the dataset/summary

The MOSAIC database holds data collected by the Julius Kuehn Institute under its monitoring activities for the implementation of Germany's National Action Plan for the Sustainable Use of Plant Protection Products. At this stage (May 2019), the database contains data on benthic macro-invertebrate community composition and concentrations of pesticides of currently 162 small lentic water bodies (<1 ha surface area) of North-East Germany. MOSAIC will be continuously updated with data from new sampling campaigns and future projects concerning the impacts of agriculture and agrochemicals on the ecological status of lentic and lotic small water bodies. Further sampling locations covering a wider geographical range will be included in future. Sampling locations are situated on or adjacent to agricultural fields and partly at reference sites, and sampling was performed using a multi-habitat-sampling method (invertebrates) and grab or passive sampling of water (pesticides). Taxa were identified to the most precise taxonomic level possible (species level whenever possible). Additionally, the database contains information on physico-chemical parameters, nutrients and agricultural management.

The content of the MOSAIC database presents a unique resource on the biodiversity of Germany's small water bodies and its potential threat by agriculture. At the current stage, it focuses on lentic water bodies which are hot spots of biodiversity. MOSAIC allows extracting information on e.g. toxic pressure of agrochemicals, field crop impact or vegetated buffer strips on all major groups of benthic invertebrates. The access is currently available to JKI staff and collaborating researchers with future web-based open access possibilities planned.

Short description of the dataset/summary (original/national language)

Die MOSAIC-Datenbank enthält Daten, die vom Julius Kühn-Institut während seiner Aktivitäten zur Umsetzung des Nationalen Aktionsplans zur nachhaltigen Anwendung von Pflanzenschutzmitteln erhoben wurden. Die Datenbank enthält aktuell (Stand Mai 2019) Daten zur Zusammensetzung der Lebensgemeinschaft benthischer wirbelloser Organismen (Makrozoobenthos) sowie Konzentrationen an Pflanzenschutzmitteln aus 162 stehenden Kleingewässern (Gewässergröße < 1 ha) Nordostdeutschlands. MOSAIC wird mit Daten neuer Untersuchungen sowie zukünftiger Projekte über den Einfluss der Landwirtschaft auf den ökologischen Zustand von Kleingewässern kontinuierlich erweitert werden. Zukünftige Probenahme-Standorte werden eine größere geographische Ausdehnung über Nordostdeutschland hinaus abdecken. Die Untersuchungsgewässer liegen entweder auf oder angrenzend an landwirtschaftlichen Nutzflächen und zum Teil in Referenzgebieten. Die Probenahmen wurden mittels Multi-Habitat-Beprobung (Makrozoobenthos) oder durch Passivsammler und Schöpfproben (Agrarchemikalien) durchgeführt. Die gefundenen Taxa des Makrozoobenthos wurden bis zum bestmöglichen taxonomischen Niveau (wenn möglich Artniveau) bestimmt. Die Datenbank enthält weiterhin Informationen zu chemisch-physikalischen Wasserparametern, Nährstoffbelastungen sowie zum Management der umgebenden landwirtschaftlichen Nutzflächen.

Der Inhalt der MOSAIC-Datenbank stellt eine einzigartige Ressource über die Biodiversität von Deutschlands Kleingewässern und deren potenzielle Bedrohung durch die Landwirtschaft dar. Im gegenwärtigen Stadium konzentriert sich der Inhalt der Datenbank auf stehende Kleingewässer, die zu den Hot Spots der Biodiversität zählen. MOSAIC ermöglicht es, die Auswirkungen z.B. der Toxizität von Agrarchemikalien, des Anbaus verschiedener Feldkulturen oder der Ausgestaltung von Gewässerrandstreifen auf alle wichtigen Gruppen des Makrozoobenthos abzuschätzen. Der Zugang steht derzeit den Mitarbeitern des JKI sowie kooperierenden Wissenschaftlern zur Verfügung, wobei zukünftige webbasierte Open-Access-Möglichkeiten geplant sind.

General information

dataset entry ID:	FWM_22
name of the dataset:	
full name of the dataset:	Metadata to the MOSAIC database on monitoring of small waters for aquatic invertebrates and agrochemicals
full name of the dataset (original/national language):	Metadaten der MOSAIC Datenbank - Monitoring von Wirbellosen und Agrarchemikalien in Kleingewässern
dataset short name:	MOSAIC database metadata
type of dataset:	species (taxonomic group) per site database including environmental information
data type:	point data/observation data
science keywords according to GCMD:	
topic:	Agriculture, Biosphere
ISO topic category according to ISO 19115:	Farming, Biota, Environment, Inland Waters
INSPIRE keywords according to GEMET:	Habitats and biotopes, Land use, Species distribution
own science keywords:	farmland ponds, insect monitoring, invertebrate monitoring, kettle holes, pesticide monitoring, prairie potholes, species distribution, water quality
related project:	National monitoring of biodiversity in agricultural areas
funding:	own funding

Technical and administrative specifications

data format:	others/specify
others/details:	PostgreSQL
operating system:	Win 8/8.1
data language:	German
current access level:	restricted access, internal
currently available through GBIF :	no
exchange planned:	yes
data in data repository:	no
Do you plan to publish the data on the Freshwater Biodiversity Data Portal:	
	no
update level:	continuously updated
documentation:	
type:	internal description
language:	German

contact details:

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Intellectual property rights and citation

dataset creator (data compiler):

contact name:	Stefan Lorenz
contact email:	stefan.lorenz@julius-kuehn.de
contact institution:	Julius Kuehn Institute

data contributors to/owners of this dataset:

	multiple
number:	3

data contributor/owner 1:

contact name:	Stefan Lorenz
contact email:	stefan.lorenz@julius-kuehn.de
contact institute:	Julius Kuehn 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 2:

contact name: Marlen Heinz
contact email: marlen.heinz@julius-kuehn.de
contact institute: Julius Kuehn 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 3:

contact name: Matthias Stähler
contact email: matthias.staehler@julius-kuehn.de
contact institute: Julius Kuehn Institute

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): Stefan Lorenz, Marlen Heinz

title and journal (name, number, pages):

The MOSAIC database on monitoring of small waters for aquatic invertebrates and agrochemicals.

year: 2019

citation of the metadata:

author(s): Tron N., Heinz M. & Lorenz S.

title and journal (name, number, pages):

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year: 2019

doi: <https://doi.org/10.15504/fmj.2019.44>

General data specifications

regional coverage of the dataset:

spatial extent of the dataset: regional
continents: Europe
countries: Europe: Germany

world climatic regions according to Köppen:

Group C: temperate/mesothermal climates
Group D: continental/microthermal climate

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

Europe: Central & Western Europe

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

Central Plains (ER14)

ecosystem type: lakes/ponds, wetlands, general freshwater

covered timeframe: 2015 - 2019

comments: The covered timeframe will be continuously updated.

Site specifications

coordinate system/grid data:	latitude/longitude, format: DD
datum (e.g. WGS84):	WGS84
grid data available:	no
ecosystem type classification:	
wetlands (classification according to GLWD):	
	wetland size
	50 - 100 % wetland
	exact wetland size data available
site coding:	
site coding available:	yes, alphanumerical
number of digits:	7
example:	BB_KH_1
number of sites:	100 - 1000
exact number of sites:	164

Climate and environmental data

climate related data:	no climate data available
environmental data:	
	no environmental data per catchment available
available parameters per site:	information on riparian vegetation (incl. information on modification)
	data source: field mapping
	substrate composition
	data source: estimated % coverage
	information on instream habitat (incl. information on modification)
	data source: estimated % coverage
	buffer strip width, surrounding field crop, available habitats
	data source: field mapping
physico-chemical data:	ortho P, nitrate, nitrite, ammonium, oxygen content, water temperature, pH, conductivity, chlorophyll
other physico-chemical parameters:	turbidity, cyanobacteria chlorophyll
availability of physico-chemical data, if there is more than one sample per site:	mean values per site
stressors influencing the sites:	
reference sites available:	yes

stressor	restored sites available	data before/after restoration available	stressor gradient available	comments
toxic stress	no	no	yes	
hydrologic stress (e.g. impoundment, flow velocity reduction, hydropeaking, water abstraction, flow velocity increase, etc.)	no	no	no	permanent and temporary ponds included

Biological data

biological data origin: general compilation,
habitat-specific quantitative assessment of invertebrates standardised by area using hand nets

organism group addressed: macro-invertebrates (Mollusca, Ephemeroptera, Odonata, Plecoptera, Coleoptera, Trichoptera, Chironomidae)

Sample specifications/sample resolution

macro-invertebrates:

sample information:

covered timeframe: 2015 - 2019

historical data: no

palaeo data: no

season: spring

temporal resolution/frequency of sampling:
per year

time series data: no

comments: The covered time frame is continuously amended.

taxonomic resolution:

level: family, sub-family, genus, species

percentage of species level data: 80

taxonomic coding:

taxalist according to: AQEM/STAR

reference(s): Schmidt-Kloiber, A., Graf, W., Lorenz, A. & Moog, O. (2006): The AQEM/STAR taxalist - a pan-European macro-invertebrate ecological database and taxa inventory. *Hydrobiologia* 566: 325-342.

sample specifications:

type: quantitative (abundance data)

replicate samples: yes

number of samples: 320

specification of method(s) used for sampling and sorting:
Habitat specific sampling with hand nets. Each habitat with a percent share > 10% of all available habitats was sampled in 3 replicates. A minimum area of 0.6 m² was sampled.

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

habitat specific samples
specific sample location (e.g. littoral, profundal, transect, shoreline, hyporheic zone, etc.):
littoral

Other specifications

GIS layers, shape files related to the dataset:

no data available

availability of photos:

yes

quality control procedures:

Were any quality control procedures applied to your dataset?

yes

quality control protocols and comments:

Samples were almost exclusively sent to taxonomic experts for the respective macro-invertebrate groups for identification (e.g. Institute BIOTA, X.-F. Garcia, M. Brauns, T. Frase, S. Speth, C.-J. Otto).

Acknowledgements

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