Metadata

MARS spatial database

General information

name of the dataset:

full name of the dataset: *MARS spatial database*

dataset short name: *MARSgeoDB*

type of dataset (more information): *environmental characteristics database*

data type: *vector data (shape files)*

short description of the dataset/summary:

The MARS spatial database (MARSgeoDB) supports analyses of European waters, providing common reference spatial layers and selected data on indicators of pressures, state and impacts of European waters. It is developed within the European research project MARS (Managing Aquatic ecosystems and water Resources under multiple Stress) in accordance with the WISE (Water Information System in Europe) concept. It is built on the ECRINS (European Catchments and Rivers Network System) spatial database (from the European Environment Agency), consisting of river segments, lakes and functional elementary catchments (FECs). It includes other available European spatial layers, such as River Basin Districts (RBDs), RBD sub-units, coastlines, regions, water bodies as reported under the WFD (Water Framework Directive) in 2010 and WISE SoE (State of Environment) locations.

For spatial objects representing waters in the MARSgeoDB we compiled indicators of pressure, state and impact: physical-chemical indicators, ecological quality ratio, ecological status, chemical status, hydromorphological status, land use, population, nitrogen and phosphorus diffuse pollution, Eurostat agricultural data, UWWTD (Urban Waste Water Treatment Directive) point sources of organic pollution, E-PRTR (The European Pollutant Release and Transfer Register) point sources of large emissions to water, hydro-morphological changes/naturalness of rivers, meteorological and hydrological characteristics. To calculate pressures acting on selected locations on waters we derived surface water receiving areas (polygons representing catchments/hinterlands). We assigned broad ecological types to rivers (20 types) and lakes (15 types) objects in the MARSgeoDB using abiotic criteria as proposed by EEA ETC/ICM (European Topic Centre on Inland, Coastal and Marine waters) in 2015. A corresponding water body code and national ecological types were assigned as well.

Spatial and associated attribute data were quality checked, unified when needed, harmonised and interlinked.

science keywords according to GCMD:

topic: *Agriculture, Biological Classification, Climate Indicators, Land Surface,*

	Terrestrial Hydrosphere
keywords:	*DPSIR, WFD, WISE SoE, watershed characteristics, rivers/streams, lakes/reservoirs, ground water, ecological status, water quality/water chemistry, discharge/flow, land use/land cover, population density, precipitation, air temperature, agriculture production*

ISO topic category according to ISO 19115**:**

Farming, Boundaries, Climatology/Meteorology/Atmosphere, Elevation, Environment, Inland Waters

Technical and administrative specifications

data format:	*Access*
others/details:	*ESRI geodatabase feature classes*
operating system:	*all Windows systems*
data language:	*English*
current access level:	*web (public)*
web address (URL):	*http://www.fgg.uni-lj.si/~/mars/MARSgeoDB/MARSgeoDB_v2.zip*
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*
update level:	*completed*
documentation:	
type:	*manual*
language:	*English*
contact details:	

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Intellectual property rights and citation

(if the dataset is already published):

dataset creator (data compiler):

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data contributors to/owners of this dataset:

citation of this dataset:

author(s):	*Lidija Globevnik, Maja Koprivsek, Luka Snoj*
title:	*MARS spatial database - European data base for management of water resources under multiple stress*
year:	*2016*
version (if applicable):	*2*

citation of the metadata:

author(s):	*Globevnik L., Koprivsek M. & Snoj L.*
title and journal (name, number, pages):	*Metadata to the MARS spatial database. Freshwater Metadata Journal 0: 0-0*
year:	*0000*
doi (if applicable):	*https://doi.org/10.15504/fmj.0000.0*
comments:	*The use of the content for commercial or non-commercial purposes is permitted free of charge, provided that the source is acknowledged.*

General data specifications

regional coverage of the dataset:

scale of the dataset:	*continental*
continents:	*Europe*

spatial extent (bounding coordinates):

southernmost latitude [°]:	*33.727485*
northernmost latitude [°]:	*71.185599*
westernmost longitude [°]:	*-24.533308*
easternmost longitude [°]:	*42.642135*
minimum altitude:	*-10 metres*
maximum altitude:	*4442 metres*
countries:	*Europe: Åland Islands, Albania, Andorra, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Gibraltar, Greece, Guernsey, Hungary, Iceland, Ireland, Isle of Man, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom, Vatican City, Kosovo*
comments:	*EU-28 + NO, IS, CH, LI, AD, RS, BA, AL, MK, ME and XK + Turkey (without Euphrates and Tigris River basins) + part of Syria and Lebanon (Asi River basin) + parts of Russia (Pregolya, Daugava, Neva, Oulujoki, Kovda and Lotta River basins), Belarus (Daugava, Neman, Vistula River basins), Ukraine (Danube and Vistula River basins), Moldova (Danube River basin)* *Some layers (feature classes) are not covering all the countries listed above.*

comments: *Different datasets are covered by different data frame. Most pressure and state data are for year 2010. Climatological data are from periods 1961-90, 1950-2000 and 2001-2010.*

Site specifications

coordinate system/grid data:	*projected, others others: ETRS89_LAEA*
datum (e.g. WGS84):	*D_ETRS_1989*
grid data available:	*yes*
resolution:	*1*
unit:	*km*
comments:	*Grid data are available for climatological data, land cover data, altitude as well as slope, population density and population count. Data of different spatial resolutions are resampled on 1 km grid.*
number of sites:	*>1000*
comments:	*There are different numbers of sites in different layers (feature classes), for example: 16694 WISE SoE rivers quality stations, 26794 UWWTD discharge points, 5043 dams, 15016 E-PRTR facility report points. All compiled data have been linked to the ECRINS catchment and river network system when possible.*

Climate and environmental data

climate related data:

available per: *per catchment*

spatial resolution of the data (if not catchment/site related): *1 km*

others: *Data are available per catchment (FEC and hinterland) and in grid (in different original resolutions depending on the source and resampled to 1 km grid).*

available parameters:

mean annual temperature January, July
WorldClim v1.4, JRC Agri4cast data source:

minimal, maximal and mean winter and summer temperatures
WorldClim v1.4, JRC Agri4cast data source:

mean annual precipitation
FAO, WorldClim v1.4, The British Atmospheric Data Centre, JRC Agri4cast data source:

winter and summer precipitation
GPCC, The British Atmospheric Data Centre, JRC Agri4cast data source:

environmental data:

available parameters per catchment: *catchment size*
ECRINS v1.1 data source:

available parameters per catchment: *catchment geology*
BGR - HMF 1500_v11, JRC - SGDBE4, WFD reporting, WRc data source:

available parameters per catchment: *catchment land cover/land use*
CLC2006 v17, CLC2000Greece, GlobCorine2009, EEA Copernicus land cover/land use data source:

available parameters per catchment: *population density*
EEA, Population density disaggregated with CLC2000, SEDAC Gridded Population v3 data source:

available parameters per catchment: *presence of barriers/dams/reservoirs (fragmentation)*
ECRINS v1.1, ESRI basemap data source:

available parameters per catchment: *hydrological regime/flow regime*
PCR-GLOBWB (DELTARES, NL) data source:

available parameters per site: *catchment land use upstream of sampling site*
CLC2006 v17, CLC2000Greece, GlobCorine2009, EEA Copernicus land cover/land use data source:

available parameters per site: *catchment land use along a buffer strip (100m width on both sides) upstream (10km) of the sampling site*
CLC2006 v17, CLC2000Greece, GlobCorine2009,EEA Copernicus land cover/land use data source:

available parameters per site: *river length*
ECRINS v1.1 data source:

available parameters per site: *distance to source*
ECRINS v1.1 data source:

available parameters per site: *distance to mouth*
ECRINS v1.1 data source:

available parameters per site: *stream order (according to Strahler)*
ECRINS v1.1 data source:

available parameters per site: *slope*
EUDEM data source:

available parameters per site: *altitude*

data source: *EUDEM*

available parameters per site: *discharge*

data source: *GRDC - EWA*

physico-chemistry data: *total P, ortho P, nitrate, total N, ammonium, hardness, TOC (total organic carbon), oxygen content, BOD5 (biochemical oyxgen demand), water temperature, pH, conductivity, chlorophyll, Secci disc depth, suspended solids*

other physico-chemical parameters: *chemical oxygen demand, dissolved organic carbon, dissolved oxygen, Kjeldahl nitrogen, silicate*

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

comments: *These are yearly average data measured at WISE SoE quality stations. For catchments (FEC) we have calculated nitrogen and phosphorus inputs in tonne per year.*

stressors influencing the sites:

reference sites available: *no*

stressor	restored sites available	data before/after restoration available	stressor gradient available	comments
eutrophication	no	no	no	TotP, total N, orthophoshate concentrations
hydromorphological degradation	no	no	no	alteration of natural riparian habitats
organic pollution	no	no	no	represented by BOD5, ammonium and nitrates
general degradation	no	no	no	EQR of invertebrates, EQR of macrophytes
hydrologic stress (e.g. impoundment, flow velocity reduction, hydropeaking, water abstraction, flow velocity increase)	no	no	no	flow alteration ratio (abstraction/no abstraction)

comments: *Proxy stressors for eutrophicaton are also: 1) share of agricultural land in catchment (upstream drainage area), in local drainage area (FEC = functionally elementary catchment) and along the river (buffer/strip area), 2) level of urban waste water treatment, 3) population density and 4) data on agricultural activities such are total yearly input of N and P (tonnes/year).*

Other specifications

GIS layers, shapes related to the dataset:

hydrological information (as HydroSHEDS)
catchments, river-sub-basins
land use
dams/reservoirs/barriers
protected areas
population density
environmental variables (freshwater or terrestrial)
climatic variables (current and predictions)
others/specify

others (specify): *polygons: EUROSTAT NUTS, country borders, coastal line, WFD ecoregions (Illies), biogeographical regions (EEA, Habitat Directive), broad hydroregions (IC fish), hydro ecoregions (Rebecca project), WWF hydro regions*
point objects: WFD surface water bodies (2010), WFD groundwater bodies (2010) WISE SoE stations, EFI+ stations

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:

When linking point pressure/state data to ECRINS hydrological catchments and river network data, spatial quality checks were performed as well as attributive QA checks (river name check, (sub)catchment check).