Metadata

Acid Waters Monitoring Network

General information

database entry ID: *BF34*

name of the database:

full name of the database: *Acid Waters Monitoring Network*

database short name: *AWMN*

type of database (more information): *species (taxonomic group) per site database including environmental information*

data type: *point data/observation data*

short description of the database/summary:

The United Kingdom Acid Waters Monitoring Network (UKAWMN), funded by the Department of the Environment Food and Rural Affairs, and the Department of the Environment Northern Ireland, was established in 1988 to monitor the ecological impact of acid deposition in areas of the UK believed to be sensitive to acidification. 22 years on, its data-base provides a long-term record of water chemistry and biology which is unique for upland freshwater systems in the UK

science keywords according to GCMD:

topic: *Biological Classification*

ISO topic category according to ISO 19115:

Inland Waters

Technical and administrative specifications

data format:	*Excel*
operating system:	*all Windows systems*
data language:	*English*
current access level:	*internal*
web address (URL):	*No web interface*
update level:	*continously updated*
Do you plan to update the database during BioFresh (before 4/2014)?	
	yes
documentation:	
type:	*scientific paper, internal description*
language:	*English*
delivery of the database for the BioFresh data portal:	
media:	*e-mail*
web address:	*no Web address*
others/details:	*the data comprise a series of Excel and CSV files*
format:	*MS Excel 97-2003, Text file (e.g. txt, csv)*
contact details:	

meta data contact:	
first, last name:	*Martin Kernan*
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first, last name:	*Ewan Shilland*
phone:	*+44(0)207 6790568*
email:	*e.shilland@geog.ucl.ac.uk*
institution:	
name:	*Environmental Change Research Centre, University College London*
address:	*Pearson Building, Gower Street*
postal code, city:	*WC1E 6BT London*
country	*UK*
web address:	*http://www.ecrc.ucl.ac.uk/index.php/*

Intellectual property rights and citation

database owner:	*BioFresh project partner*
contact details:	*Martin Kernan (m.kernan@ucl.ac.uk)*
citation:	
author(s):	*M.Kernan, R.W.Battarbee, C.J.Curtis, D.T.Monteith & E.M.Shilland (Eds.)*
reference title:	*Recovery of lakes and streams in the UK from acid rain. The United Kingdom Acid Waters Monitoring Network 20 year interpretative report (2010). Report to the Department for Environment, Food and Rural Affairs (Contract EPG 1/3/160)*
year:	*2010*
data provider(s) to this database:	*single*
criteria for using the data in a publication/scientific analysis:	
	Other/Additional criteria
Other/Additional criteria:	*The data are available for use at the discretion of the data provider.*

General data specifications

regional coverage of the database:

scale of the database:	*national*
continents:	*Europe*

spatial extend (bounding coordinates):

southernmost latitude [Â°]:	*50°30′19.80*
northernmost latitude [Â°]:	*57°25′03.39*
westernmost longitude [Â°]:	*007°34′39.21&#*
easternmost longitude [Â°]:	*000°04′35.03&#*
minimum altitude:	*10 meters*
maximum altitude:	*785 meters*
countries:	*Europe: United Kingdom*

Site specifications

coordinate system/grid data:	*Latitude/Longitude, format: DD*
datum (e.g. WGS84):	*WGS84*
grid data available:	*no*
site coding available:	*yes*
	alphanumerical
example:	*NAG = Lochnagar*
exact number of sites:	*23*
comments:	*The sites have not been classified according to WFD but the data would be available to do so.*

Climate and environmental data

climate related data:

available per:	*per catchment*
available parameters:	*mean annual temperature January, July*
data source:	*Meteorological Office*
available parameters:	*mean annual temperature for each month*
data source:	*Meteorological Office*
available parameters:	*minimal, maximal and mean winter and summer temperatures*
data source:	*Meteorological Office*
available parameters:	*daily air temperatures*
data source:	*Meteorological Office*
available parameters:	*mean annual precipitation*
data source:	*Meteorological Office*
available parameters:	*winter and summer precipitation*
data source:	*Meteorological Office*
available parameters:	*mean discharge*
data source:	*Monitored*

environmental data:

available parameters per catchment:	*catchment size*
data source:	*Maps /GIS*
available parameters per catchment:	*catchment geology*
data source:	*Maps /GIS*
available parameters per catchment:	*catchment land cover/land use*
data source:	*Maps /GIS*
available parameters per catchment:	*presence of barriers/dams/reservoirs (fragmentation)*
data source:	*Maps /GIS*
available parameters per catchment:	*hydrological regime/flow regime*
data source:	*Maps /GIS*
available parameters per site:	*catchment land use upstream of sampling site*
data source:	*Maps /GIS*
available parameters per site:	*information on riparian vegetation (incl. information on modification)*
available parameters per site:	*information on embankment (incl. information on modification)*
available parameters per site:	*information on channel form (incl. information on modification)*
available parameters per site:	*information on cross section (incl. information on modification)*
available parameters per site:	*information on water uses (e.g., irrigation, fish ponds)*
data source:	*Survey*
available parameters per site:	*distance to next migration barrier upstream*
available parameters per site:	*distance to next migration barrier downstream*
available parameters per site:	*distance to the next lake upstream*
data source:	*Maps/GIS*
available parameters per site:	*river length*
data source:	*Maps/GIS*
available parameters per site:	*distance to source*
data source:	*Maps/GIS*
available parameters per site:	*distance to mouth*
available parameters per site:	*stream order (according to Strahler)*
available parameters per site:	*slope*
available parameters per site:	*altitude*
data source:	*Maps/GIS*
available parameters per site:	*hydrological regime/flow regime*

available parameters per site: *discharge*
data source: *Monitored*
available parameters per site: *current velocity*
data source: *Monitored*
available parameters per site: *maximum depth*
data source: *Field measurment*
available parameters per site: *mean depth*
data source: *Field measurment*
available parameters per site: *wetted width*
data source: *Field measurment*
available parameters per site: *substrate composition*
data source: *Field measurment*
available parameters per site: *information on instream habitat (incl. information on modification)*
data source: *Field measurment*
physico-chemistry data: *total P, ammonium, sulphate, chloride, sodium, magnesium, labile aluminium, calcium, alkalinity, TOC (total organic carbon), oxygen content, water temperature, pH, conductivity, colour, Secci disc depth, thermocline depth, substrate, sediment/soil parameters*
availability of physico-chemical data, if there is more than one sample per site: *mean values per site*

stressors influencing the sites:

stressor	restored sites available	data before/after restoration available	stressor gradient available	comments
acidification	**no**	**no**		
toxic stress	**no**	**no**		
thermal stress				

Biological data

biological data origin:	*from sampling*
specify project:	*UK Acid Waters Monitoring Network*
organism group addressed:	*fish, macro invertebrates (Ephemeroptera, Odonata, Plecoptera, Trichoptera, Chironomidae), (benthic) diatoms, macrophytes*

Sample specifications/sample resolution

fish:

sample information:

covered timeframe:

year from - to: *1988 - 2010*

historical data: *yes*

palaeo data: *no*

season: *summer, autumn*

temporal resolution/frequency of sampling:

per year

time series data: *yes*

taxonomic resolution: *species*

percentage of species level data: *100*

comments: *Only brown trout*

taxonomic coding:

coding system: *None*

sample specifications: *quantitative (abundance data)*

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

Annual electric fishing surveys are employed to assess the abundance, age structure and standing stock of salmonid populations at each stream site and at the outflow streams immediately downstream from each lake site. Fishing takes place between mid-September and mid-October. Five local laboratories take part in the fish component of the Network (see collaborators). Marine Scotland and ENSIS/ECRC provide central coordination of the fish surveys.

The sampling procedure involves isolating within a 500 m section, three 50 m reaches of the stream with stop nets. Where topographical conditions permit these reaches are at least 50 m apart. Each 50 m reach is fished using electric fishing apparatus, usually from the downstream to the upstream net. The fishing is repeated three times, or more if no clear drop off in numbers has occurred. The fish are anaesthetised and the fork length and weight of each individual fish are recorded. All fish are retained in holding boxes in the stream and returned alive at the cessation of electric fishing.

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

habitat specific

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

stream body and outflow channel for lakes

macro invertebrates:

sample information:

covered timeframe:

year from - to: *1988 - 2010*

historical data: *yes*

palaeo data: *no*

season: *spring, summer*

temporal resolution/frequency of sampling:

per year

time series data: *yes*

taxonomic resolution: *species*
percentage of species level data: *75*
comments: *With the exception of Diptera, Oligochaeta and Bivalva, taxa are identified to species level. Taxonomic grouping of certain species is carried out to reduce sample variability. Exact counts are made of each taxa.*
taxonomic coding:
coding system: *Species names used*
sample specifications: *quantitative (abundance data)*
replicate samples: *no*
specification of method(s) used for sampling and sorting:
At stream sites five separate one minute kick samples are made with a standard hand net. Only riffle sections are sampled. Each sample is separated into 3 size fractions with sieves. The finest sieve is 300um mesh. Each fraction is diluted to achieve maximum sample separation. Using a white tray, halogen lamp and fine forceps, all invertebrates are picked out and placed in a vial containing 70% IMS.

At lake sites, samples are collected from littoral habitats with a standard hand net. At each lake, five one minute kick/sweep samples are collected from the dominant habitat. Samples are preserved and counted as at the stream sites.
sample type (e.g. habitat specific samples, composite samples etc.):
Habitat specific
other important sample related informations:
Stream bed and littoral zone of lake

(benthic) diatoms:

sample information:
covered timeframe:
year from - to: *1988 - 2010*
historical data: *yes*
palaeo data: *yes*
season: *summer*
temporal resolution/frequency of sampling:
per year
taxonomic resolution: *species*
percentage of species level data: *95*
taxonomic coding:
coding system: *Diatcode*
example: *AC003A = Achnanthes microcephala*
sample specifications: *quantitative (abundance data)*
specification of method(s) used for sampling and sorting:
At stream sites five cobble size stones are selected from pools at a depth below that of minimum flow, in three discrete locations -upstream, middle and downstream of a surveyed 50 m reach. At lake sites five cobble size stones are selected from the permanently submerged littoral at three or four surveyed locations around the shore, with areas close to inflow or outflow streams being avoided. Epilithic diatoms are removed by brushing into a tray, decanted into plastic vials and preserved with Lugols Iodine.

Samples are prepared using standard techniques (Battarbee et al. 2001)

and examined by light microscopy at x1000 magnification. Three hundred valves are counted from each sample and identified to species level and the abundance of each taxon is expressed as a percentage of the total count. Identification and nomenclature follows that developed by the Royal Society SWAP programme (Munro et al. 1990) and subsequently maintained and updated in DIATCODE at the ECRC. Slides and suspensions are archived for quality control.

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

habitat specific

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

stream beds and lake littoral zone

macrophytes:

sample information:

covered timeframe:

year from - to: *1988 - 2101*

historical data: *yes*

palaeo data: *no*

season: *summer*

temporal resolution/frequency of sampling:

each stream is sampled annually while lakes are sampled biannually, and, since funding cuts, triannually

time series data: *yes*

taxonomic resolution: *species*

percentage of species level data: *95*

taxonomic coding:

coding system: *Species names used*

sample specifications: *quantitative (abundance data), semi-quantitative, presence/absence*

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

Lake Sites

Each lake is sampled by three methods:
Inshore survey

As much of the inshore zone as possible is viewed either by walking the shoreline, wading or from a slow-moving boat. Emergent, floating and submerged macrophytes in the shallow inshore zone are recorded and major stands annotated on to a large scale map. Major vegetation types fringing the lake are also recorded.
Trawl survey

Two transverse trawls (four in larger lakes) are made across the lake by trawling a grapnel (double headed rake) attached to a long rope behind a boat travelling at a steady speed. Each traverse is sub-divided into five approximately equal trawl sections for which the amount of plant material recovered and relative abundance of individual macrophyte taxa are estimated. [Trawls are carefully situated away from coring sites and sediment traps.]
Transect survey

Three sites in each lake (four in larger lakes) are chosen for more detailed

survey transects of 50-60 m in length aligned perpendicular to the shore. At least one transect is located on a steeply shelving and/or exposed shore. A fixed line is deployed along the transect and Ekman grab samples are taken from the sediment surface at 10 m intervals with an additional site 5 m from the shore. Water depth, substrate type, amount of plant material and relative abundance of species are recorded for each Ekman grab sample and the exercise is duplicated at each sample point along the transect.

The location of end stations of both lake trawls and transects are recorded by GPS to ensure that subsequent sampling occurs in the same areas. Since the trawls and transect survey are destructive sampling methods, sampling exactly along previous survey lines is avoided as far as possible. In practice however the process of setting the transect can result in overlaps between visits.

The combination of the three survey methods provides information to assess the relative abundance of individual macrophytes occurring in each lake. Moreover, the profiles generated by the transects indicate the approximate maximum depth to which living macrophytes extend. This information is transferred to the central biological database and summarised in the annual data reports of the Network as a list of taxa together with DAFOR abundance estimates.
Stream Sites

Dry-weather flow is a pre-requisite for sampling in-stream macrophytes. A 50 m section of stream containing a representative range of aquatic macrophytes is selected. Every 5 m from 0-50 m inclusive, a transect is laid across the water-filled section of the channel and water depth, substrate and macrophyte taxa (if any) are recorded at three equidistant points along that transect. In the 5 m stream sections between each transect the stream bed is surveyed and the total amount of plant cover (expressed as a percentage of submerged stream bed) and floristic composition of the plant assemblages are estimated visually; the substrate composition of the stream bed is also recorded in these sections, which are easily replicated in subsequent surveys.

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

Composite samples

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

littoral and profundal. Stream channel

Other specifications

GIS layers, shapes related to the database:

catchments, river-sub-basins
land use

availability of photos: *yes*

availability of maps: *yes*

quality control procedures:

quality control protocols and comments:

The multifaceted nature of the Acid Waters Monitoring Programme determines that field sampling and laboratory analysis of biological and chemical determinands are the responsibility of several organisations and laboratories each with in-house quality control procedures.