CCM2 River and Catchment Database for Europe
Version 2.1 Release Notes
(7th July 2008)

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The following notes detail the changes implemented from version 2.0 to version 2.1 of CCM2. The development and characteristics of Version 2.0 are detailed in the Vogt et al. (2007): *A pan-European River and Catchment Database.* EC-JRC (Report EUR 22920 EN) Luxembourg. The current Release Notes should be read together with this report. All documents and data are available at http://ccm.jrc.it/.

1. CCM2, version 2.1, is released in both Geographic Coordinates and in the Lambert Azimuthal Equal Area Projection (LAEA).

2. Data are provided in the form of a zipped ESRI File Geodatabase per data window.

3. Errors in the *Pfafstetter* field of the *riversegments* and *catchments* tables have been corrected. Related fields <> are updated as well.

4. Errors in the *Nextdownid* field in the *riversegments* and *catchments* tables have been corrected. The field now indicates the final element of a river or catchment sequence flowing into the sea by the value -9999.

5. The following new feature attributes have been added to the *riversegments* table:

    a. *maindrain_class:* indicates that riversegments belong to a certain 'drainage class' (i.e. draining an area of 400 to <500, 500 to <600, 600 to <700, 700 to <800, 800 to <900, 900 to <1000, 1000 to <2000, 2000 to <3000, 3000 to <4000, 4000 to <5000, and >=5000 km^2). NULL values signify that riversegments have a drainage area size below the 400 km^2 threshold. See Figure 1 for an example of the Ebro Basin.

    b. *maindrain_id:* The flow path marked within a given *maindrain_class* represents the river segments of the underlined longest flow path in that (sub-) system and has a unique identifier stored in *maindrain_id*.
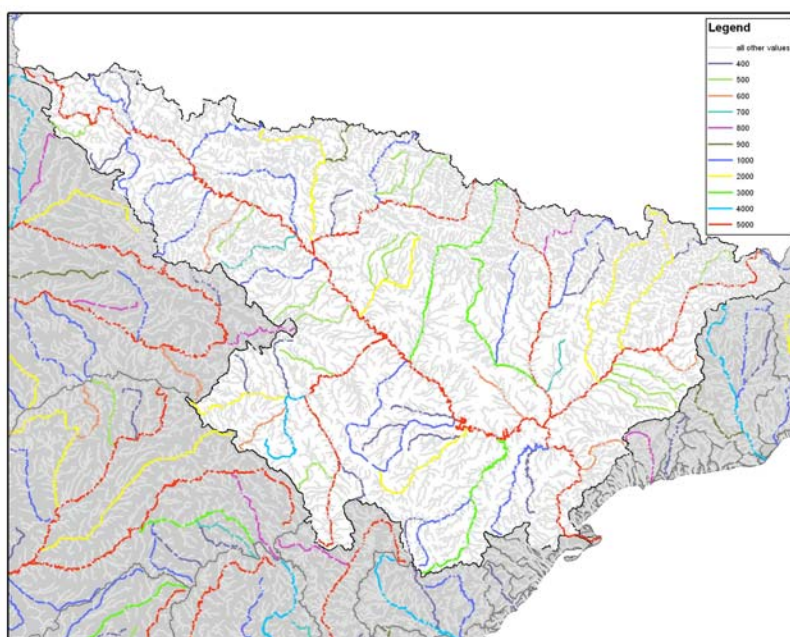
Figure 1: Ebro River Basin.

Main rivers (i.e. maindrain_class Not Null) in colour and other rivers in grey.

6. A new data layer termed **mainrivers** has been created containing all river segments having **maindrain_class** values Not Null. These river segments are combined to generate a new directed line for each river stretch (source to confluence, confluence to confluence, confluence to mouth). The table **mainrivers** contains the following attribute data:

No.	Field Name	Description
1	ID	Unique identifier of the main river[1] (= maindrain-ID in riversegments)
2	WSO_ID	ID of the River Basin (Seaoutlet) to the which the main river belongs
3	PFAFSTETTER	Pfafstetter code of the feature 'main river', equivalent to the Pfafstetter code of the most down-stream riversegment comprising the main river
4	MAINDRAIN_CLASS	Indicates the drainage class (see point 5 of this document)
5	INT_NAME	Default name of a river or a list of names (separated by comma), usually in English
6	WINDOW	The dataset ID that refers to the so-called data window[2] (from 2000 to 2018) to which the main river belongs
7	MAIN_PER_WSO[3]	Indentifies whether the main river is a longest river within its River Basin (Seaoutlet), Y(es) or NULL

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[1] Please note mainriver = maindrain

[2] For the location of a data window refer to http://ccm.jrc.it/php/index.php?action=view&id=24.

7. A new data layer termed *namedrivers* has been created containing the named riversegments (i.e. having *rvr_id* values Not Null) that are combined together to make the new directed line geometry. The result is a new directed line for each distinct *id*. Table *namedrivers* contains the following attribute data:

No.	Field Name	Description
1	ID	Unique identifier of the named river. Note that IDs from CCM1 have been preserved, where possible. IDs greater than 1000000 are new
2	NAME	Name of a river as it is named at the source
3	LGE_ID[4]	ISO language code of the river name
4	INT_NAME	Name of the river, using the 26 standard Latin alphabet characters, usually English.
5	PFAFSTETTER	Pfafstetter code of the feature 'named river', determined as the highest level Pfafstetter code on the branch that the named river segments follow (e.g., river segments with Pfafstetter codes 461, 463, 465, 467 that form one branch will have a Pfafstetter code of 46)
6	WSO_ID	ID of the River Basin (Seaoutlet) to the which the named river belongs
7	WINDOW	The ID of the data window to which the named river belongs

8. Some 700 new river names have been added (field *name* in *namedrivers* table; field *rvr_id* in *riversegments* table). Alternative river names are available in the new table *altrivernames* that contains no spatial data.

9. A new data layer termed *islands* has been created. Each island is made up of one or more River Basins (Seaoutlets) that border each other. The table *islands* contains the following attribute data:

No.	Field Name	Description
1	ID	Unique identifier of an island
2	NAME	Name of the island in the language most spoken on the island
3	LGE_ID	ISO language code of the island name
4	INT_NAME	Name of the island in the 26 Latin Characters, usually in English

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[3] Similar to a LONGPATH attribute from RIVERSEGMENTS table
[4] N.B. LGE_ID = LGE_CD

5	XMIN_LAEA	The minimum X coordinate of the bounding box of the island in ETRS-LAEA coordinate system
6	YMIN_LAEA	The minimum Y coordinate of the bounding box of the island in ETRS-LAEA coordinate system
7	XMAX_LAEA	The maximum X coordinate of the bounding box of the island in ETRS-LAEA coordinate system
8	YMAX_LAEA	The maximum Y coordinate of the bounding box of the island in ETRS-LAEA coordinate system
9	LAEA_AREA	The area of the island in the ETRS-LAEA coordinate system units (square meters)
10	LAEA_PERIMETER	The perimeter of the island in the ETRS-LAEA coordinate system units (meters)
11	HDM_ID	Reference to the Hydrographic System in which the island lies
12	SEA_ID	Reference to the Sea in which the island lies
13	COAST_SORT	Identifier of the coast line segment on the continent closest to the Island
14	COAST_DIST	Shortest distance from the Island to the continental coastline (in meters)
15	ISLAND_SORT	Unique and sorted Identifier for the Island within the Hydrographic System and Sea in which it lies. The ID has been generated based on the combination of the Coast_Sort and Coast_Dist attributes for all islands larger than 3 km^2. As a result islands are sorted along the coastline and if two island are located along the same coastal segment, then they are sorted according to distance from the coast.

10. Climatic, slope and elevation data, previously stored in the 'catchments.inf' table is now integrated into the *catchments* table.

11. A new **coasts** table has been created that contains line geometry rather than polygon geometry (as in the CCM2 version 2.0) and has attribute data. Each coastal segment is equivalent to an outerborder of a coastal catchment (i.e. adjacent to a sea). Table **coasts** contains the following attribute data:

No.	Field Name	Description
1	ID	Unique identifier of a coastal segment
3	WSO_ID	ID of the River Basin (Seaoutlet) to the which the coastal segment belongs
4	SYSTEM_CD	Reference to the Hydrographic System to which the coastal segment borders
5	SEA_CD	Reference to the Sea to which the coastal segment borders
6	SORTING	Identifier of the coastal segment, sorted along the coast in clockwise direction, starting with 1 for continental Europe as well as for each island
7	ILD_ID	ID of the island to which the coastal segment belongs. Segments belonging to a continental coast have value 0.
8	LENGTH	Length of the coastal segment, in meters
9	FROMNODE	Unique identifier of the node at the start the coastal segment
10	TONODE	Unique identifier of the node at the end the coastal segment
11	WINDOW	ID of the data window to which the coastal segment belongs

12. The attribute data for *system_cd* and *sea_cd* are available in the tables **hydrosystems** and **seas**, respectively.

13. There are two File Geodatabase covering the whole CCM2 area of interest:
    a. RiverBasins, including all River Basins (seaoutlets), the islands, the main rivers and the named rivers.
    b. Lakes, including all lakes and the coastline.