

## Historical hydrographic vector features, Traun river - Upper Austria, 1819-1869, Nov. 2022

This metadata refers to the vector dataset digitised from the historical military topographical map series: "Lower and Upper Austria – Second military survey of the Habsburg Empire" covering a period from 1819-1869. The focus has been on the Danube river basin area where this metadata covers the first of three pilot areas.

This pilot-1 area (Traun river – Upper Austria) covers approximately 5,000 km<sup>2</sup> distributed in 10 scanned historical map tiles in scale 1:28,800 provided by Arcanum Maps services:

(<https://maps.arcanum.com/en/>). Hydrographic features were identified in the historical maps supported by the legend information (<https://www.arcanum.com/media/uploads/mapire/legend/secondsurvey1.pdf>). The feature classes and attributes specified were used as basis in the digitisation process. The characteristics of the pilot-1 is Mountainous area and low land area. The Copernicus Land product Riparian Zones (RZ) layer for the reference year 2018 was used as a mask when digitising, representing 1,414km<sup>2</sup> of the total area.

The objective with this dataset is to support the process of restoring Europe's free flowing rivers as part of the EU's biodiversity strategy for 2030 ([https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030\\_en](https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en)). The strategy aims to put Europe's biodiversity on a path to recovery by 2030, and contains specific actions and commitments. Among them, the restoration of 25,000 km of rivers through removals of dams, channels, barriers, etc. is highlighted. The dataset clearly visualise the hydrographic features complemented in the military maps in the past. Visualised with contemporary data it provides an overview of the changes made. The high complexity of the branched rivers is very interesting since they correspond to rivers in its natural state.

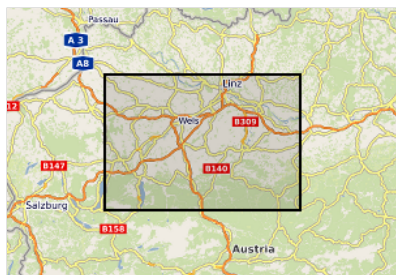
This pilot may help to better understand the possibilities of developing quantitative measurements that allow for better "identification" of areas suitable for restoration.

### Simple

Date (Creation)	2022-03-01				
Date (Publication)	2022-11-30				
Edition	01.00				
Citation identifier	eea_v_3035_10_k_historic-hydro-p1_p_1819-1869_v01_r00				
Point of contact	Organisation name	Individual name	Electronic mail address	Website	Role
	European Environment Agency		sdi@eea.europa.eu	<a href="http://www.eea.europa.eu">http://www.eea.europa.eu</a>	Point of contact
	European Environment Agency		sdi@eea.europa.eu		Custodian
Maintenance and update frequency	Not planned				
GEMET - INSPIRE themes, version 1.0	<ul style="list-style-type: none"><li>Hydrography</li></ul>				
Keywords					
Keywords					
GEMET	<ul style="list-style-type: none"><li>natural areas, landscape, ecosystems</li><li>water body</li><li>historical evolution</li><li>river</li><li>restoration of water</li><li>hydrology</li><li>environment</li></ul>				
	<ul style="list-style-type: none"><li>Austria</li></ul>				

Continents, countries, sea regions of the world.	
	<ul style="list-style-type: none"> <li>• European</li> </ul>
Spatial scope	<ul style="list-style-type: none"> <li>• Water</li> </ul>
EEA topics	Other restrictions
Access constraints	<a href="#">no limitations to public access</a>
Other constraints	Other restrictions
Use constraints	EEA standard re-use policy: unless otherwise indicated, re-use of content on the EEA website for commercial or non-commercial purposes is permitted free of charge, provided that the source is acknowledged ( <a href="http://www.eea.europa.eu/legal/copyright">http://www.eea.europa.eu/legal/copyright</a> ). Copyright holder: European Environment Agency (EEA).
Other constraints	
Aggregate DatasetIdentifier	041a8c96-62e7-4844-9b49-3f81bc3ac375
Association Type	Cross reference
Spatial representation type	Vector
Denominator	10000
Language of dataset	English
Topic category	<ul style="list-style-type: none"> <li>• Environment</li> <li>• Inland waters</li> </ul>

	N		S		E		W
--	---	--	---	--	---	--	---



<b>Begin date</b>	1819-01-01		
<b>End date</b>	1869-12-31		
<b>Additional Information</b>	Some of the key-findings in the process digitising historical topographical maps are hugh reduction of water surface areas and river length when comparing the digitised areas with contemporary data. The length of the Danube river covered by the extent of pilot-1 (5 000 km2) has decreased with more than 10%.		
<b>Coordinate reference system identifier</b>	<a href="#">EPSG:3035</a>		
<b>Distribution format</b>	<ul style="list-style-type: none"> <li>GDB ( )</li> <li>Geopackage ( )</li> </ul>		
<b>OnLine resource</b>	<b>Protocol</b> EEA:FOLDERPATH  WWW:URL  OGC:WCS  WWW:DOWNLOAD-1.0-http--download  WWW:DOWNLOAD-1.0-http--download	<b>Linkage</b> <a href="https://sdi.eea.europa.eu/webdav/datastore/public/eea_v_3035_10_k_historic-hydro-p1_p_1819-1869_v01_r00/">https://sdi.eea.europa.eu/webdav/datastore/public/eea_v_3035_10_k_historic-hydro-p1_p_1819-1869_v01_r00/</a> <a href="https://sdi.eea.europa.eu/data/faef9c3f-2d53-46be-81a2-e533f9ba88b5">https://sdi.eea.europa.eu/data/faef9c3f-2d53-46be-81a2-e533f9ba88b5</a> <a href="https://portal.discomap.eea.europa.eu/arcgis/apps/webappviewer/index.html?id=fc66cb6b4f054344b7ba77e3355ffa8b#">https://portal.discomap.eea.europa.eu/arcgis/apps/webappviewer/index.html?id=fc66cb6b4f054344b7ba77e3355ffa8b#</a> <a href="https://sdi.eea.europa.eu/catalogue/srv/api/records/faef9c3f-2d53-46be-81a2-e533f9ba88b5/attachments/Digitalisation_of_historical_rivers_EXECUTIVE_SUMMARY_EEA.pdf?approved=true">https://sdi.eea.europa.eu/catalogue/srv/api/records/faef9c3f-2d53-46be-81a2-e533f9ba88b5/attachments/Digitalisation_of_historical_rivers_EXECUTIVE_SUMMARY_EEA.pdf?approved=true</a> <a href="https://sdi.eea.europa.eu/catalogue/srv/api/records/faef9c3f-2d53-46be-81a2-e533f9ba88b5/attachments/Digitalisation-of-historical-rivers_Pilot1.pdf?approved=true">https://sdi.eea.europa.eu/catalogue/srv/api/records/faef9c3f-2d53-46be-81a2-e533f9ba88b5/attachments/Digitalisation-of-historical-rivers_Pilot1.pdf?approved=true</a>	<b>Name</b>   Direct download  Web Coverage Service  Digitisation of historical maps - executive summary all pilots  Digitisation of historical maps - pilot 1
<b>Hierarchy level</b>	Dataset		

## Conformance result

<b>Title</b>	Commission Regulation (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services
<b>Date (Publication)</b>	2010-12-08
<b>Explanation</b>	See the referenced specification
<b>Statement</b>	Georeference process:

10 maps covering the selected study area (Pilot 1) were georeferenced in ArcGIS Pro software, using for each map, well distributed 12 Ground Control Points (GPCs). The maps available by the Arcanum ( <https://maps.arcanum.com/en/browse/composite/>) WMTS server were used as a reference in the georeferentiation process. A 2nd order polynomial transformation was applied obtaining a Root Mean Square (RMS) error below 1 pixel for all maps.

Twelve feature classes were defined: six polygon feature classes, three line feature classes and three point feature classes. (A: polygon feature; L: line feature; P: point feature)

Polygon feature description:

River\_A: Streams and riverbanks or water edges.

Channel\_A: Man-made water channels.

Island\_A: Land area surrounded by water. It can be a lake or river island.

Waterbody\_A: Gathers different inland water bodies:

- Natural lake: lakes, ponds, swamps, lagoons.
- Artificial: reservoir (dam).
- Oxbow lake: lake – former part of river course – created by erosion.
- Watermill pond: water body used as a reservoir for a water-powered mill.

Wetland\_A: Peatbogs, cane growing areas, soft lands...

FloodPlain\_A: An area of low-lying ground adjacent to a river, formed mainly of river sediments, small streams and subject to flooding.

Line feature classes

River\_L: A naturally flowing watercourse. Represented by centre line of all streams and rivers.

Coastline\_L: A coast line.

Channel\_L: Man-made water channels. Represented by centre.

Point feature classes:

Bridges\_p: Different type of bridges that can be observed over the maps.

Elevation\_p: Elevation data observed over the rivers.

Watermill\_p: Watermill points, associated with watermill ponds.

Basic specification:

A geodatabase was created containing all the features defined. Domains were created when needed, in order to facilitate the digitisation process and avoid typo errors, e.g., different waterbody types (natural lake, artificial, oxbow lake and watermill pond).

- The digitisation scale was set on 1:5,000 – 1:10,000 in order to reach the MMU established.

- The projected WGS 1984 Web Mercator (auxiliary sphere) coordinate system was established, the same as the maps available through the Arcanum WMTS server.

River polygons can contain gaps:

River polygons could contain gaps, and these gaps corresponded to islands. In the case of branched rivers, all the connected branched rivers wider than 20m (established as a MMU) were considered

River unique centre lines

Each river wider than 20m, was represented as polygon and also as line feature class. This line feature class represented the river centre line

Stream lines that flows to a main river

Side river- or stream lines continue flowing into main rivers. The stream line was connected to the centre line of the main stream following the shortest way, the flow direction, and without overlapping the islands. EUDEM was used to ensure the correct flow direction.

Branched rivers

The high complexity of the branched rivers is very interesting since they are river in its natural state. All the connected branched streams or rivers wider than 20m were considered and drawn as a polygons. Those narrower than 20m, were considered case by case.

River centre lines through lakes

In cases where a stream flows into a lake, a centre line was digitised in order to maintain a continuity and to ensure a complete river network.

Floodplains

This feature class gathers an area of low-lying ground adjacent to a river, formed mainly of river sediments, small streams and subject to flooding. In order to define these areas, the process was based on the information provided by the maps (both text and graphic information), and an available EUDEM (GSD: 25m) was used as auxiliary information in order to verify the coherence of the digitised area.

Complexity of maps

The complexity of maps is very variable because 1) the complexity of the river itself vary a lot, e.g., single versus branched river, and 2) is not the same to digitise over mountainous areas composed mainly of big lakes and streams or to digitise over valley bottom areas, were floodplains, river lines, channels, and branched rivers can be found

Quality of maps

It was observed that the quality of the maps varied, 1) between consecutive maps, and 2) inside a map. Rivers that could not be digitised with the needed certainty were defined as diffuse in the "Accuracy" field of the attribute table

Accuracy of the maps

In general terms the accuracy of the maps in the Second Survey is good in most parts of the Empire. The maximum error is cca. 200 meters (Timár, Gábor & Biszak, Sándor & Székely, Balázs & Molnár, Gábor. (2011). Digitised Maps of the Habsburg Military Surveys – Overview of the Project of ARCANUM Ltd. (Hungary). DOI: 10.1007/978-3-642-12733-5\_14). Lack of continuity between consecutive maps can occur.

High level of detail of the historical maps

Due to the high level of details in the historical maps, it was possible to identify place and location names of many features (e.g., rivers, lakes, streams). The names have been included in the geodatabase. Besides, in cases were the name was not clear enough, available basemaps have also been searched in order to get or verify names.

Further documentation of the definition of the feature classification and the digitisation process can be accessed under 'Links'.

Metadata

File identifier	faef9c3f-2d53-46be-81a2-e533f9ba88b5 <a href="#">XML</a>		
Metadata language	English		
Character set	UTF8		
Hierarchy level	Dataset		
Date stamp	2023-02-21T10:20:51.904Z		
Metadata standard name	ISO 19115/19139		
Metadata standard version	1.0		
Metadata author	Organisation name	Individual name	Electronic mail addressWebsite Role
	European Environment Agency		sdi@eea.europa.euPoint of contact

Overviews

Historical hydrographic features (Pilot-1)  
Lower and Upper Austria (1819-1869)  
Second military survey of the Habsburg Empire

- Historic river centreline
- Historic river
- Historic islands
- Historic floodplain / wetlands



Provided by

