Final Draft Working Document

European River Catchment

Updates: Iceland, Malta and Romania

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Partners involved	ETCLUSI – UAB
Date	16.11.2007
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1 ORIGINAL DATASETS

- From ERC_F1V01EEA16936I
    - European River Catchments (2006)

- From CCM2v2
    - River catchments Level 5
    - River basins

- From EGM2
    - Waterlines
    - Coastline
    - Lakes
    - Water areas

- National data
    - From Romania
        - River catchments
    - From Malta
        - River catchements
        - Other data regarding the WFD Implementation
    - From Iceland
        - Assessments and data

2 ORIGINAL METHODOLOGY

2.1 CREATION OF THE ERC

The European River Catchment (ERC) layer is created from three layers. Primarily CCM2V2 consists of the complete CCM2 aggregation level 5. In areas not covered by CCM2 level 5 the layer “CCM2 river basins” was used. Though the combination of CCM2 level 5 and river basins did make up most of the coverage a lot of coastal parts were still not covered. The data layer was completed by adding the EGM2 coastline and thereby creating coastal catchment areas. The choice of coastline was EGM2 because the coastline fitted with the EGM2 rivers that end in the sea.

Before the EGM2 coastline was combined with the new CCM2v2 level 5 and river basin layer the CCM2v2 layers were clipped with the EGM coastline layer. This was done in order to remove catchments areas seawards from the EGM coastline. The new layer, ERC consisting of CCM2v2 level 5, CCM2v2 river basins and EGM2 coastline was converted to singlepart polygons in order to split coastal catchments. Besides the original CCM2v2 layers were already singlepart polygon layers. Finally the ERC layer was generalized by removing points that were placed further away than 75 meters from the existing border. The remove point generalization was done in order to ease and speed up the manual editing. In addition it flattered out the square appearance of the original CCM2 catchments borders.

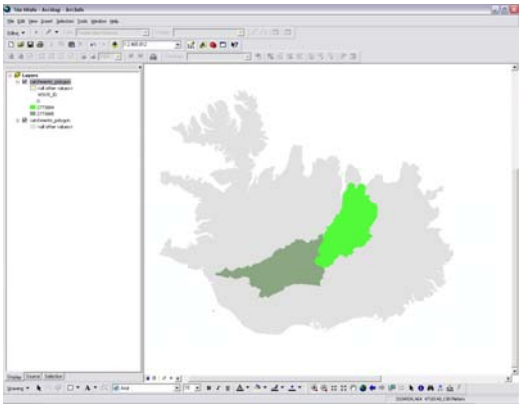
There are two exceptions for this methodological report, the specific cases of Malta and Iceland have been taken into account. In order to show the real facts of each country, the basic data from CCM2v2 Level 5 has not been taken into account due that this level represents the whole country. For this reason the first CCM2v2 level with catchments different than the national borders have been taken for each country.

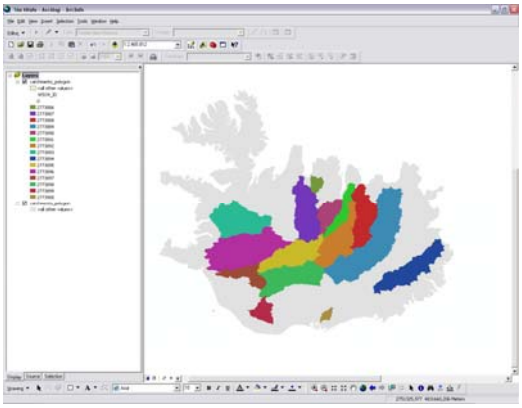
For this specific reason a new column has been included in the ERC attributes called “BASIN_NAME2” to show the additional names that could bring the catchments.

For Iceland: The Icelandic catchment update has been produced without any digital official data from the Icelandic institutions. The catchments definition has been developed following the assessment from different Icelandic Institutions. The combination of data from the CCM2v2 and the EGM rivers has helped us to produce the main catchments, but not the basins.

Taking into account that Iceland covers one single basin and in order to show a better coverage for the country, CCM2v2 Level 4 was taken into account for developing the ERC catchments in this area.

Level 5 Level 4

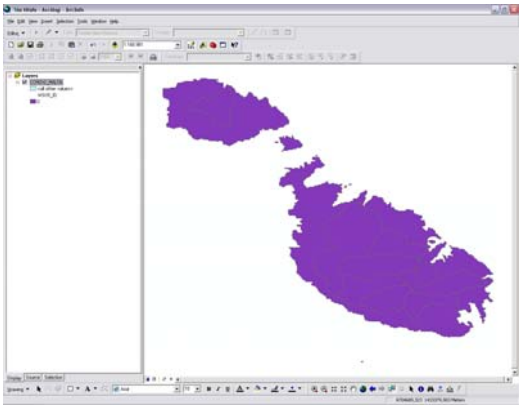


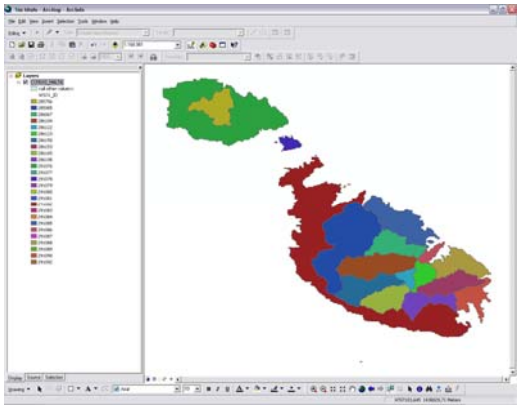


For Malta:

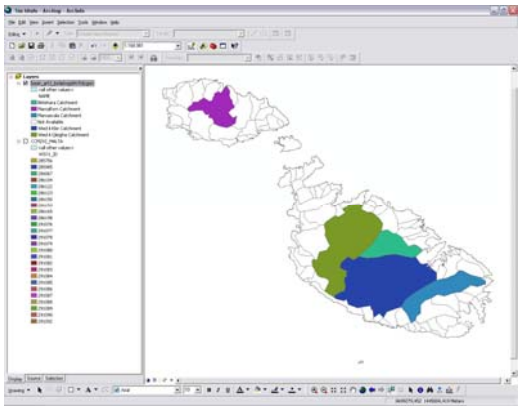
Malta is considered as part of a national "basin" called "Malta" by the WFD official documents.

Level 5 Level 1





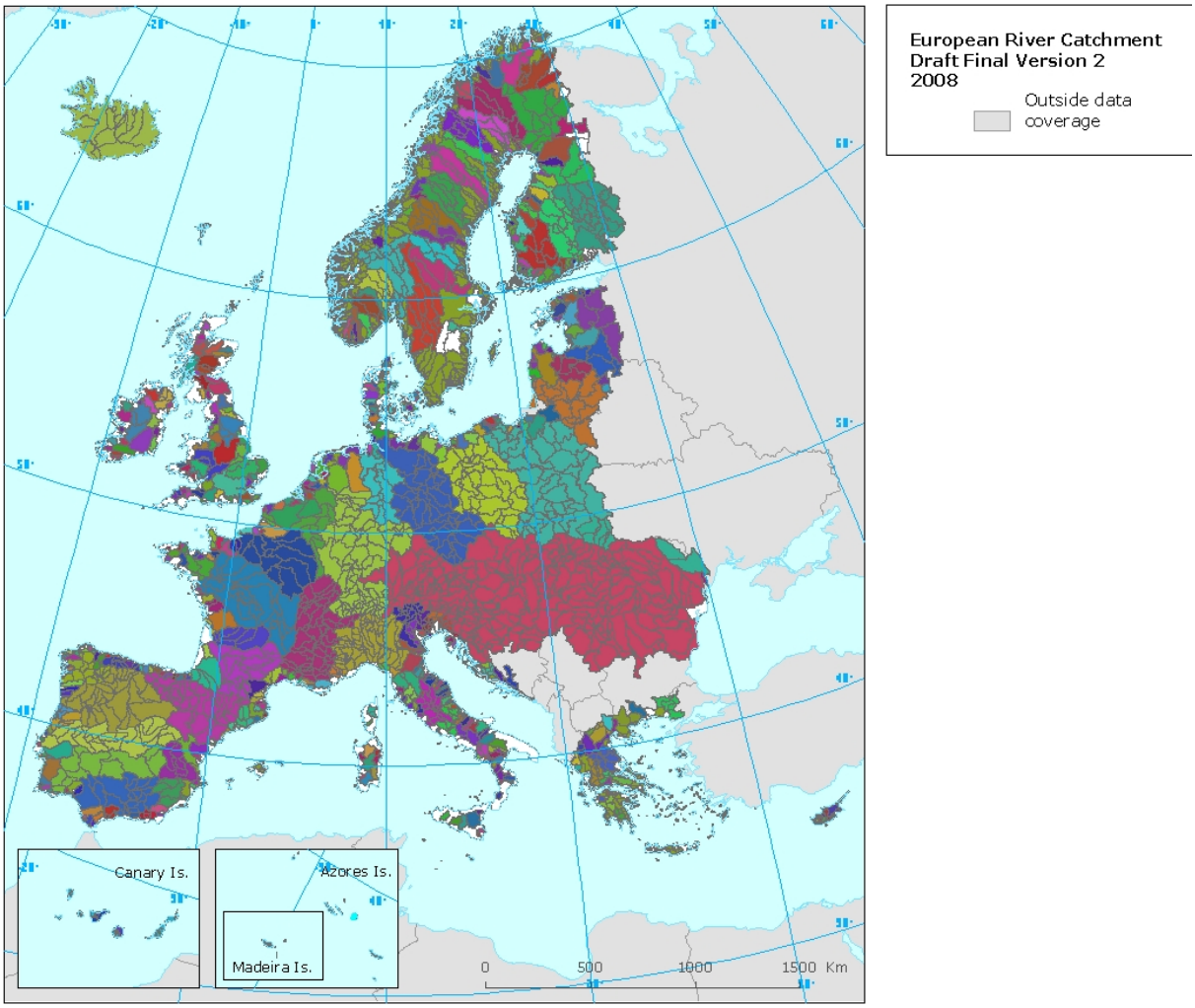
National data from Malta:



2.2 GEOGRAPHICAL COVERAGE

The editing was being done in the EGM coverage where the CCM2v2 catchments were available. The EGM2 river coverage is following country borders closely at the Eastern border of the river network coverage. This entails that some rivers are appearing disconnected from the rest of the river network (at the border to Bosnia & Herzegovina, Ukraine, Belarus and Russia). In these cases the catchments borders were either not changed or they were corrected according to CCM2 rivers and Image2000 as if the whole river existed in the EGM river network. Additionally new countries have been updated: Iceland, Malta and Romania.

Taking into account the country borders, 28 countries are covered by the ERCv2 2007.



3 MANUAL EDITING

In order to exclude errors in overlapping and missing areas of catchments a topology was created on the dataset (ERC) and the editing was made using this topology. The manual editing was done the following way:

1) Help layers: When fitting the ERC catchment borders to the EGM2 river network the following helping layers were in mind: 1) the EGM lakes and reservoirs when in connection with an EGM2 river, 2) the national catchment borders, 3) the elevation and 5) the slope of the area. The helping layers were prioritized in the mentioned order. Image2000 was sometimes used to check the actual location of the river or water area. Especially it was used as support in coastal catchments or geometric mistakes from the owner.

2) Digitizing method: The ERC catchment borders were replaced by reshaping or modifying the border or by tracing (following) the national catchment border.

3) Junctions: Relevant catchment border junctions near river junctions were moved to snap the river junction. This was also the case if the junction was placed in a lake or reservoir. In this case the catchment junction was placed on the node of the artificial line layer (the ficri layer).

4) Water areas inland: When a catchment border was crossing a lake or reservoir the border was navigated so it did not intersect the water area. In these cases the river catchment was aimed to include an eventual lake upstream at the end of the river as well as it was aimed not to include an eventual lake downstream at the end of the river. The corrections were done only for lakes and reservoirs that were in connection with a river. To this was the exception mentioned above that is when the lake or reservoir constituted a junction between three catchments. When the catchments border was crossing lakes or reservoirs that did not have any connection to an EGM2 river these water areas were ignored.

5) Non river catchments: When the ERC catchment did not contain any EGM2 river and did not have any connection to the sea the catchment was merged with the appropriate downstream neighbour catchment that had an EGM2 river. The appropriate catchment was found using the CCM2 river network and the elevation model Gtopo30.

6) Non river coastal catchments: Coastal catchments that did not include an EGM river were not changed. This involves the narrow coastal catchments containing only sand dunes. It is suggested that some of the non river coastal catchments are merged (E.g. catchments from the RiverBasin layer should stay as original and catchments from the level 5 layer should be merged to the relevant catchment).

7) River catchments: In some cases neighbouring catchments both containing the same river were merged. These cases mostly appeared in the coastal catchments. If it appeared inland it was checked that the merge did not conflict with the CCM2V2 level 6 catchment borders.

   Exceptions to this have been made due to presumed mistakes in the EGM2 river network. These mistakes can be found in the chapter regarding geometrical mistakes.

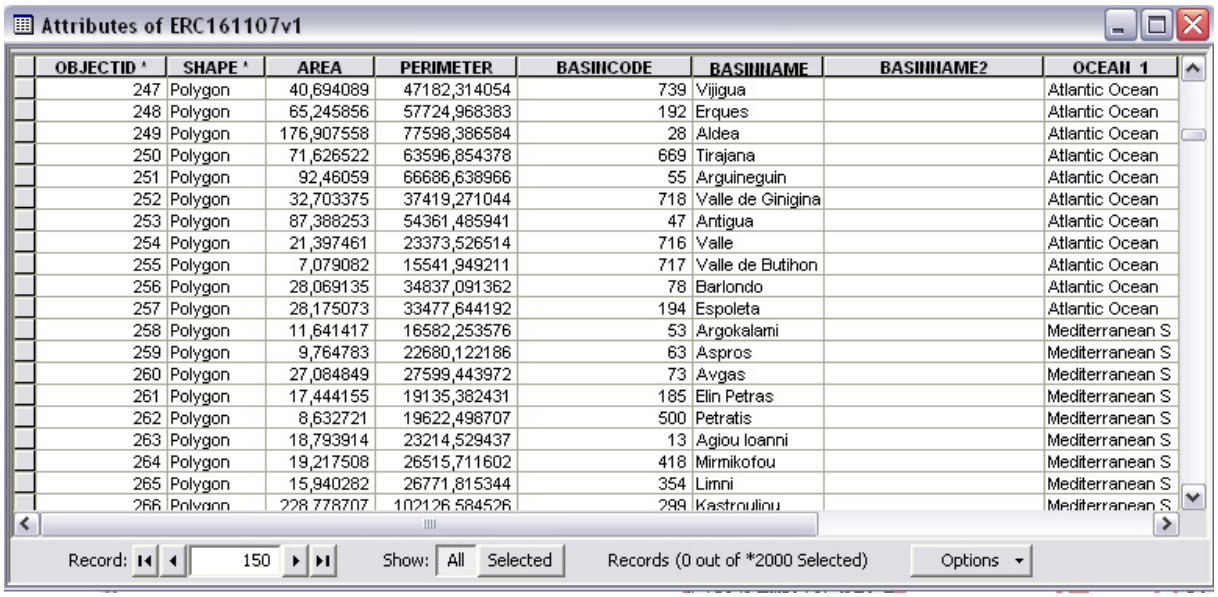
8) Small catchments: The original CCM2v2 layers contain small catchments less than 10000 m2. These were merged to the appropriate catchment in cases where editing was already necessary. The ERC though still contain a great part of these small catchments as there were approximately 4000 of them from the start. In addition, more small catchments arouse from the combination of the CCM2 layers with the EGM adjusted coastline.

The aim is to obtain a dataset of catchments fitting EGM rivers to be used at the scale of 1:1 million. The digitizing edits were done with a minimum of 500 m between vertices or following the national catchment borders. The digitizing was in general done with an appropriate distance between vertices such that it can be accepted on the 1:1 million scale.

4 QUALITY CHECK

Attributes:

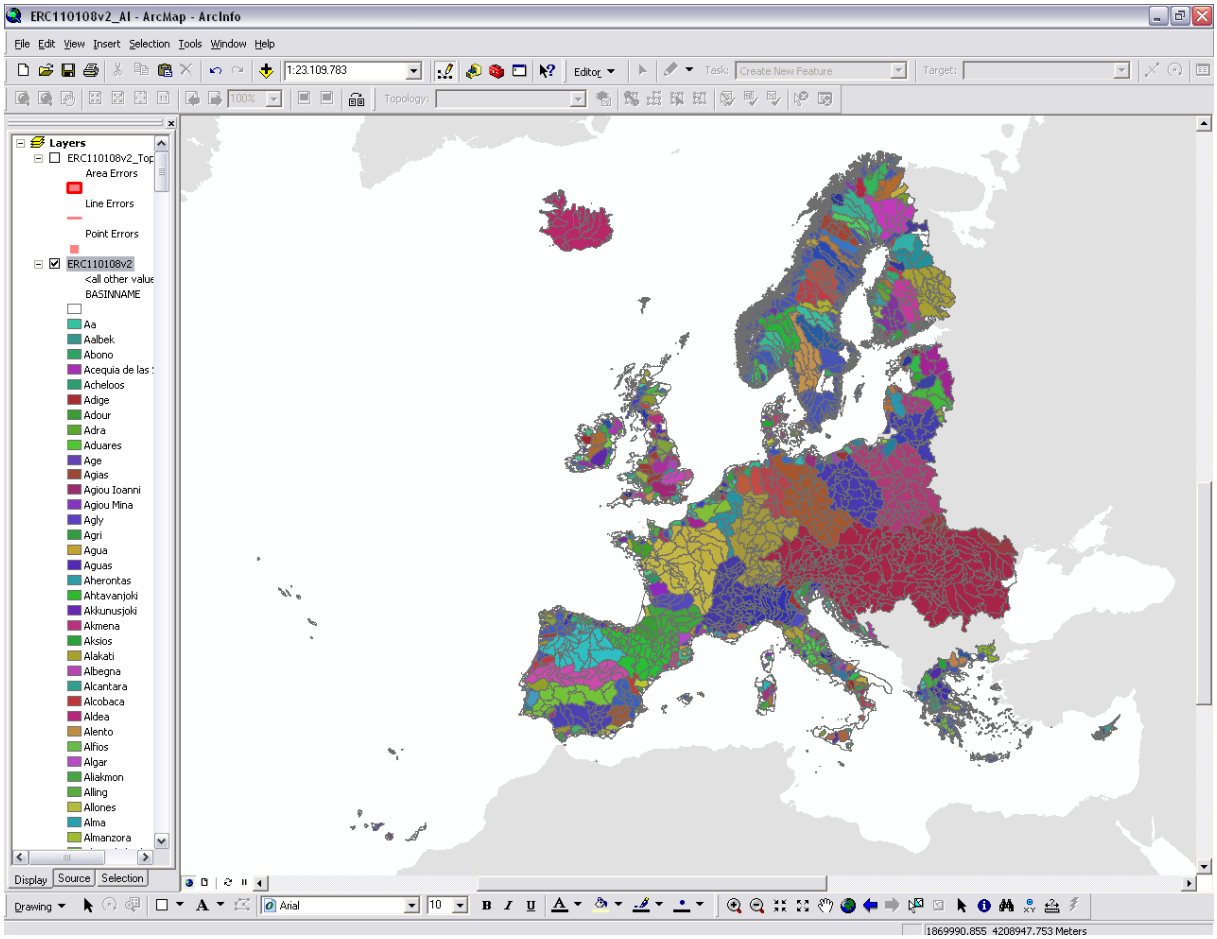
The ERC attributes were established during the work done during 2006, each catchment is alredy identified taking into account the following explainations:



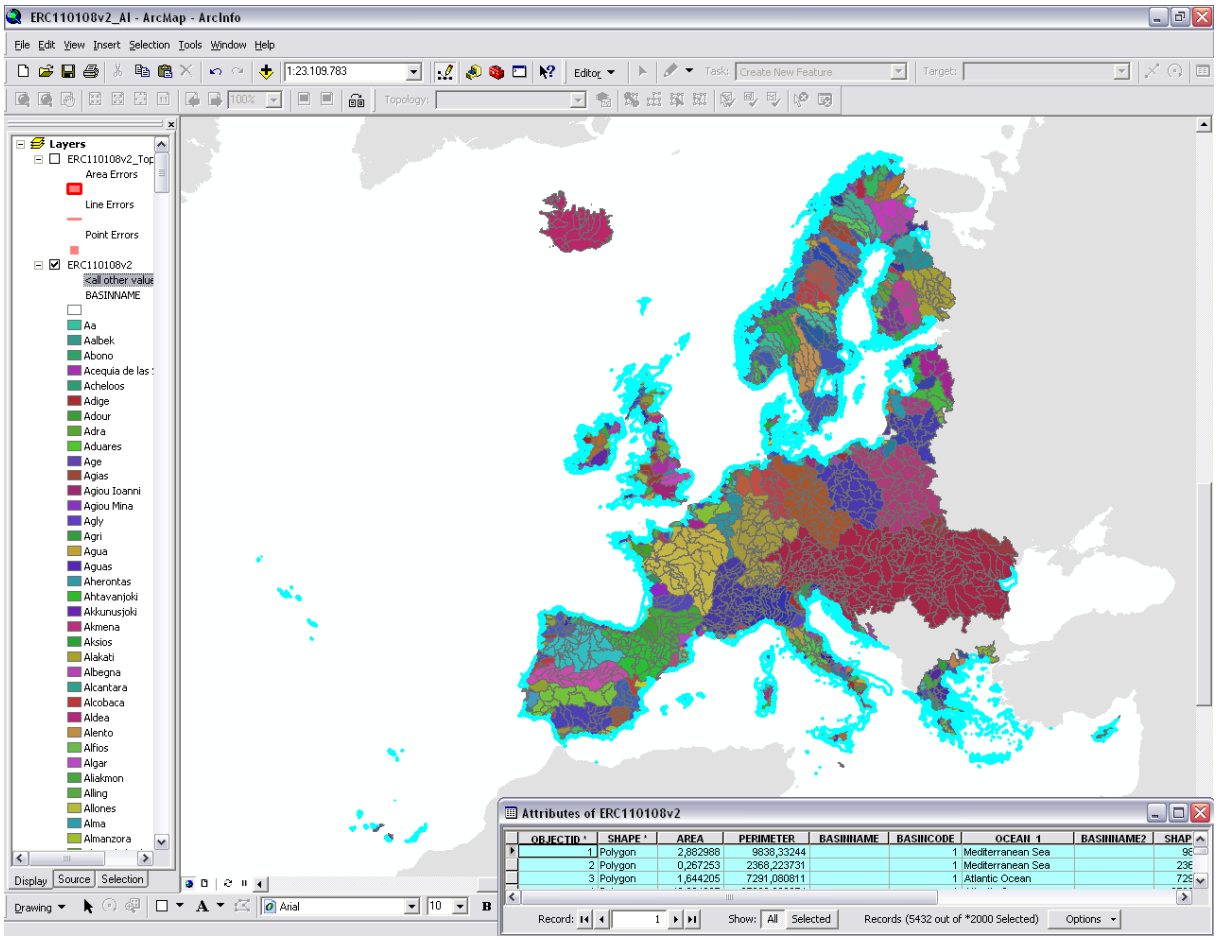
OBJECTID *	SHAPE *	AREA	PERIMETER	BASINCODE	BASINNAME	BASINNAME2	OCEAN_1
247	Polygon	40,694089	47182,314054	739	Vijigua		Atlantic Ocean
248	Polygon	65,245856	57724,968383	192	Erques		Atlantic Ocean
249	Polygon	176,907558	77598,386584	28	Aldea		Atlantic Ocean
250	Polygon	71,626522	63596,854378	669	Tirajana		Atlantic Ocean
251	Polygon	92,46059	66686,638966	55	Arguineguin		Atlantic Ocean
252	Polygon	32,703375	37419,271044	718	Valle de Ginigina		Atlantic Ocean
253	Polygon	87,388253	54361,485941	47	Antigua		Atlantic Ocean
254	Polygon	21,397461	23373,526514	716	Valle		Atlantic Ocean
255	Polygon	7,079082	15541,949211	717	Valle de Butihon		Atlantic Ocean
256	Polygon	28,069135	34837,091362	78	Barlondo		Atlantic Ocean
257	Polygon	28,175073	33477,644192	194	Espoleta		Atlantic Ocean
258	Polygon	11,641417	16582,253576	53	Argokalami		Mediterranean S
259	Polygon	9,764783	22680,122186	63	Aspros		Mediterranean S
260	Polygon	27,084849	27599,443972	73	Avgas		Mediterranean S
261	Polygon	17,444155	19135,382431	185	Elin Petras		Mediterranean S
262	Polygon	8,632721	19622,498707	500	Petratis		Mediterranean S
263	Polygon	18,793914	23214,529437	13	Agiou Ioanni		Mediterranean S
264	Polygon	19,217508	26515,711602	418	Mirmikofou		Mediterranean S
265	Polygon	15,940282	26771,815344	354	Limni		Mediterranean S
266	Polygon	228,778707	102126,584526	299	Kastroulinu		Mediterranean S

ObjectID = Each polygon is identified
Shape = All the components of this dataset are polygons
Area = Square Kilometers
Perimeter = meters
BasinCode = Number identifiying the basins that have already been identified with a "BasinName". Basins with no name are identified by number "1".
BasinName = Name of the basin where the catchments are included.
BasinName2 = Second "BasinName" or "catchments identity"
Ocean_1 = Ocean or sea where the river basin flows.

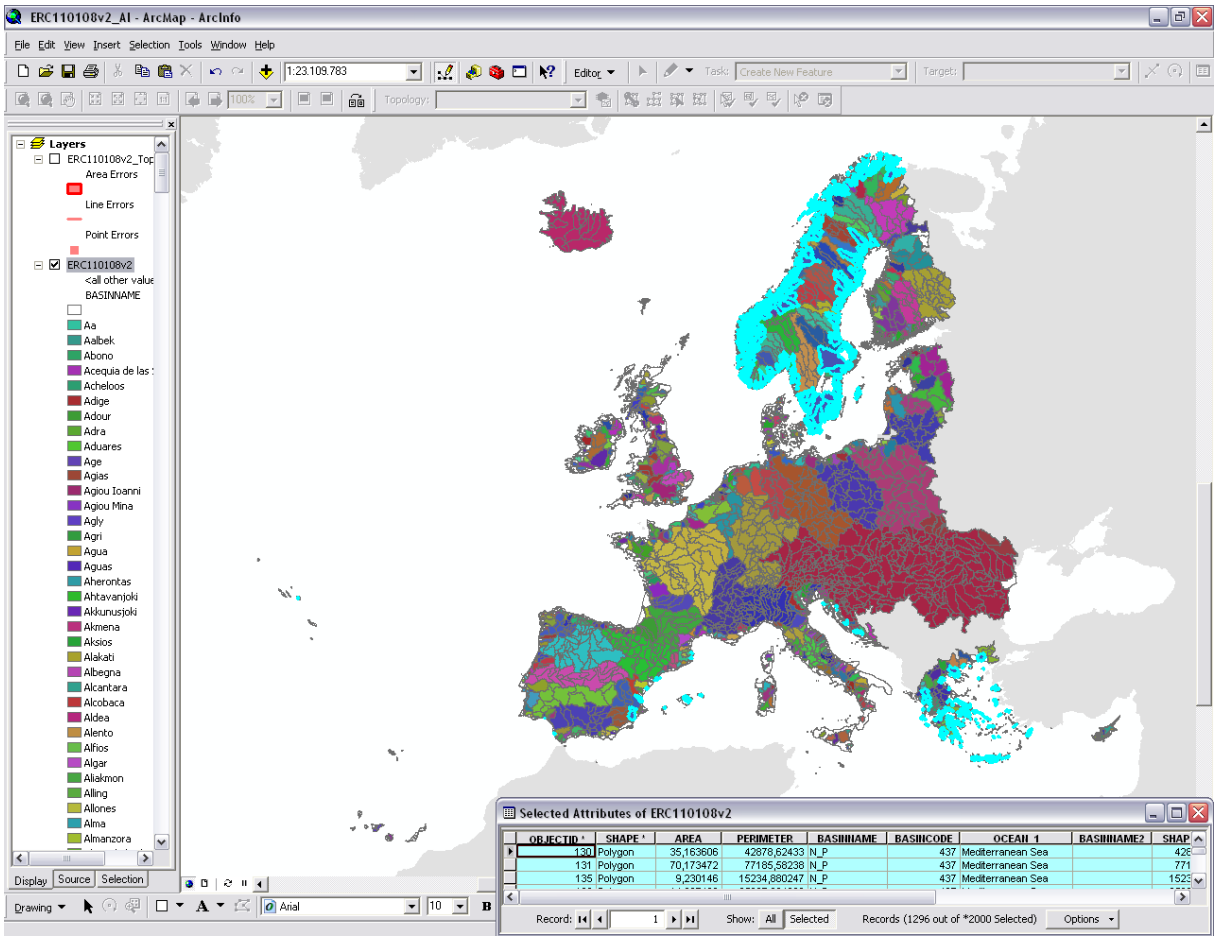
Finally **2.148 catchments** have already been identified and integrated inside a river basin covering **84,7% of the covered study area.**



There are still an important amount of polygons (5432) that have not been identified for different reasons, during the work done in 2006 the coastal catchments were not taken into account as it has been explained in the editing manual chapter, and the small islands that are identified as a polygon. These polygons without any name represents the 9,4% of the covered study area.



The same methodology we have followed for all of these polygons where the basin name is “N/P”. 1.296 polygons have also been identified in the coastal areas and in small islands. These polygons represent the 5,9% of the covered study area.



5 PROBLEMS AND MISTAKES FOUND DURING THE EDITING PROCESS

A working grid 100x100m has been developed in order to organize the work and locate the question marks.

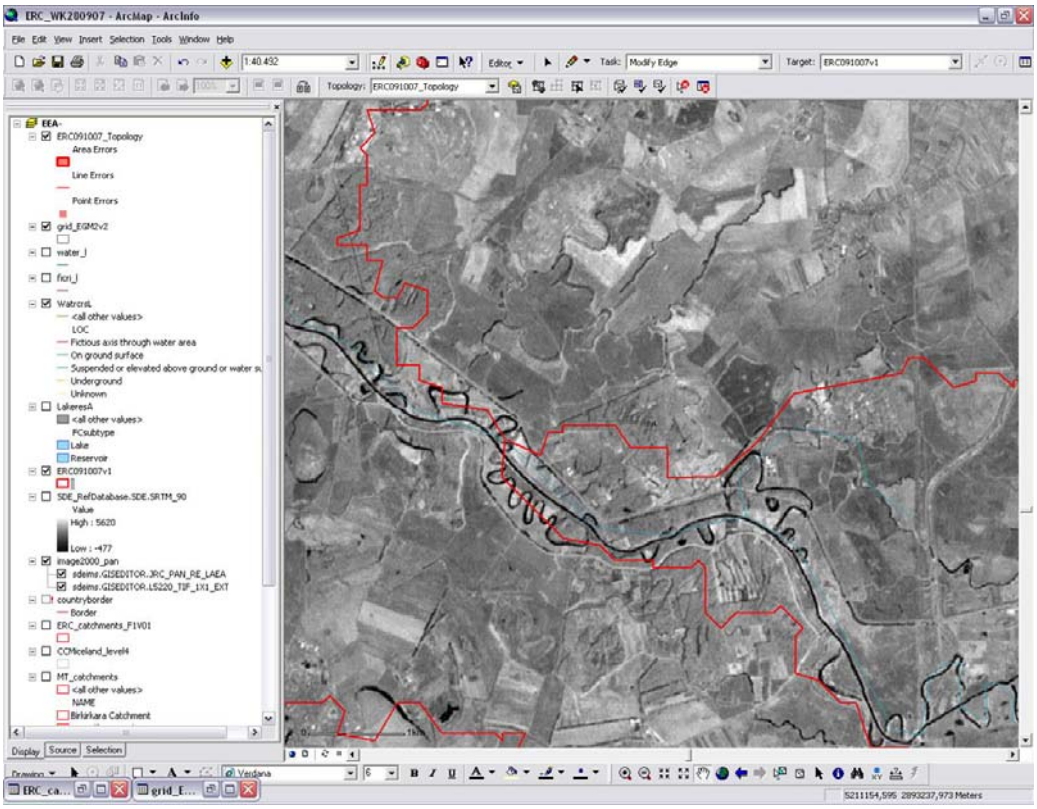
5.1 RIVER INTERPRETATION

The new EGMv2 Waterline shows the same geometrical mistakes than the older version. There is neither fixed nor homogeneous methodology regarding the meander's river interpretation. For the same river we have found examples where the interpretated line includes the old or abandoned meanders, for other cases this old meanders have been interpretated as part of the main river.

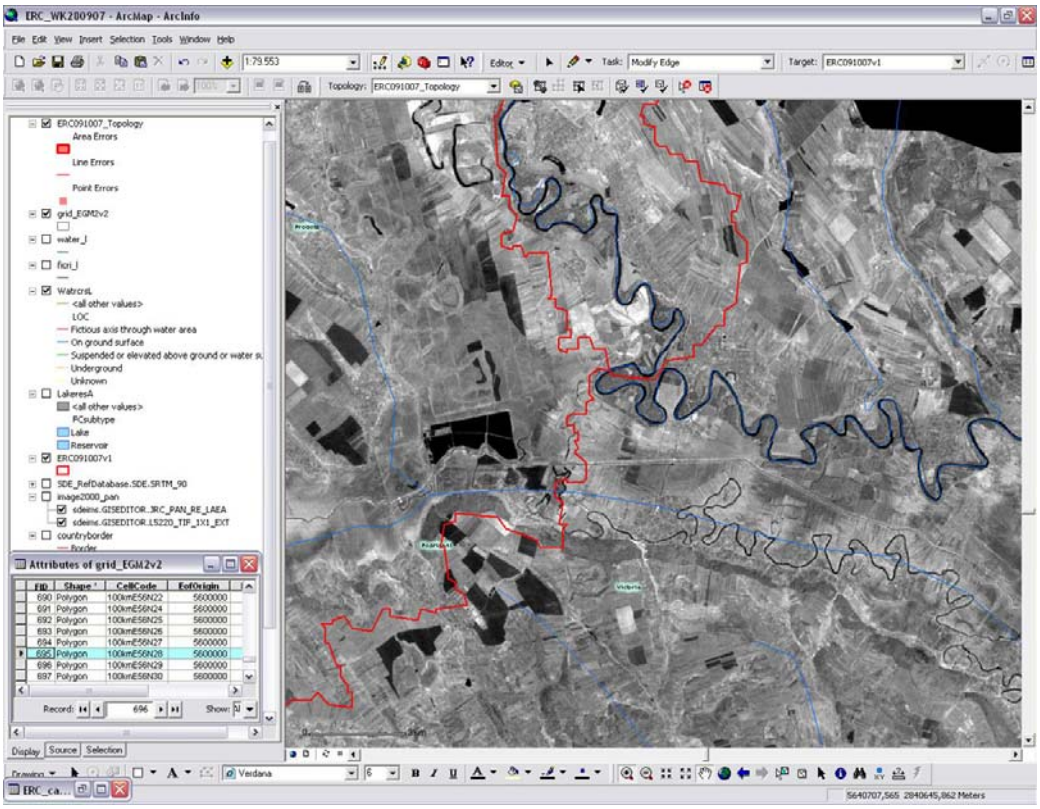
Since we have to follow the EGMv2 as base of our work, I have reshaped and modified different catchment's border to addapted into this new methodology.

Following geo-hydrology rules and river systems, it is not correct the interpretation from EGM, because the water supply to abandoned meanders are not always depending on the running water from the river, in some cases these abandoned meanders are just water storage from rain or human deviations what separate them from the current river. For these kind of problems, Romania is the hardest example.

Example cell 594



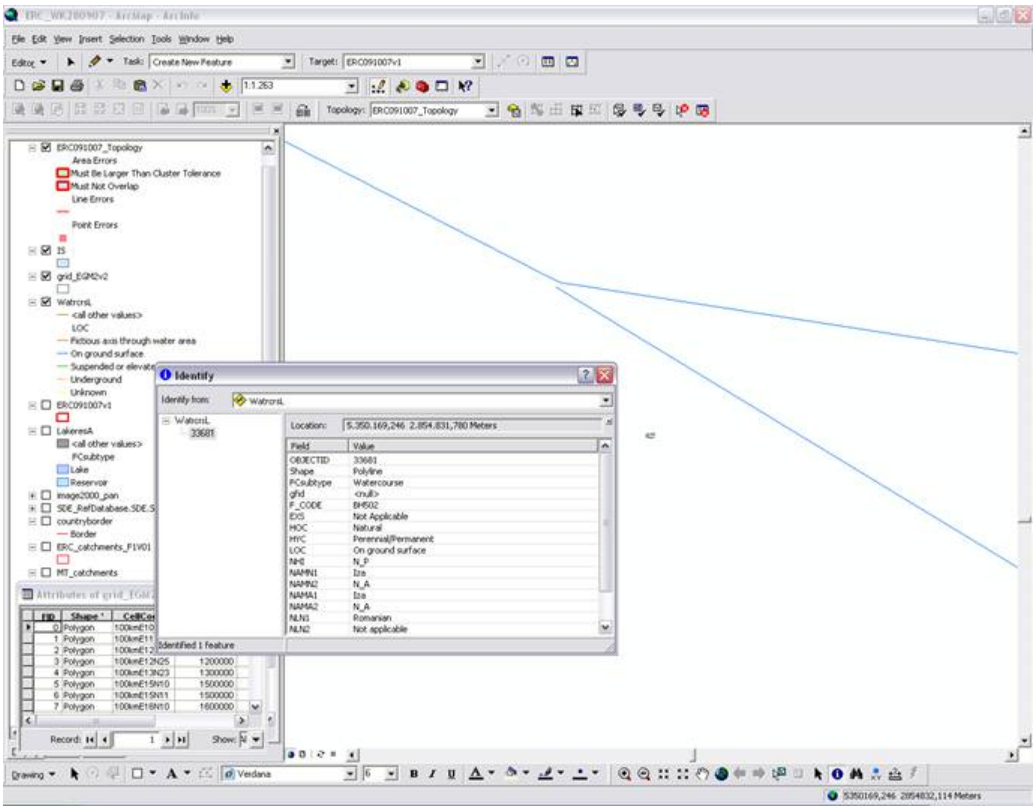
These errors, located principally in plain regions of the European Union, were alredy reported to EuroGeographics after the work done for the first version of the EEA European River Catchment.

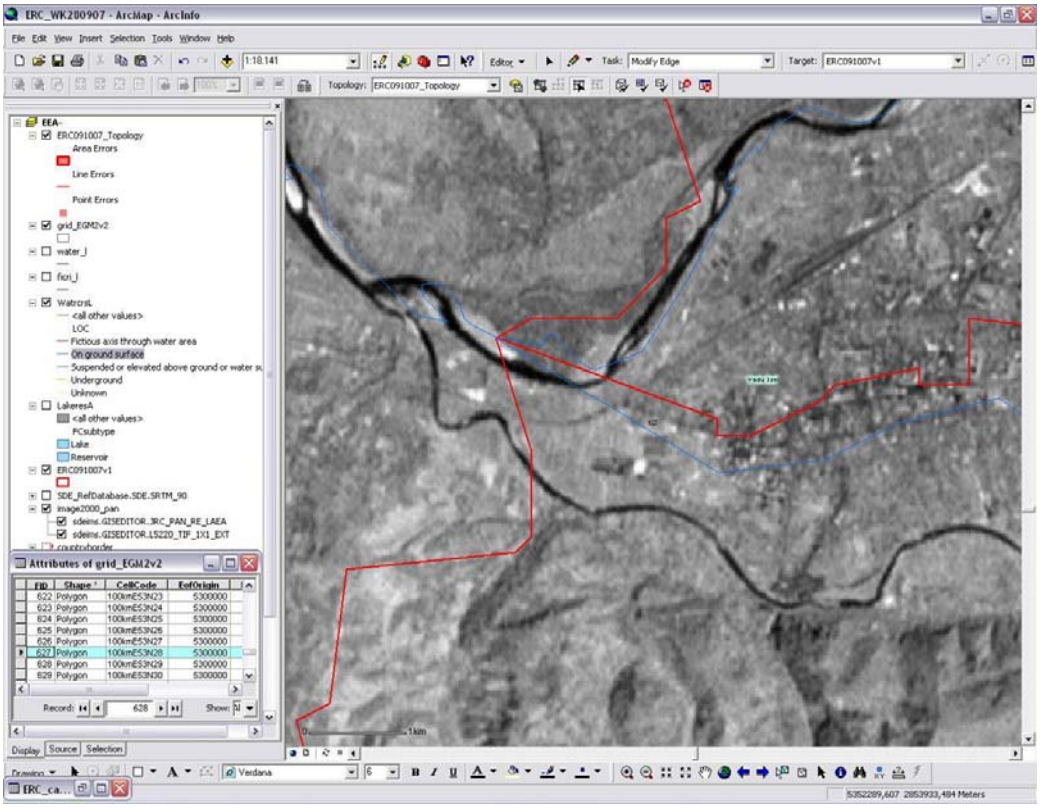


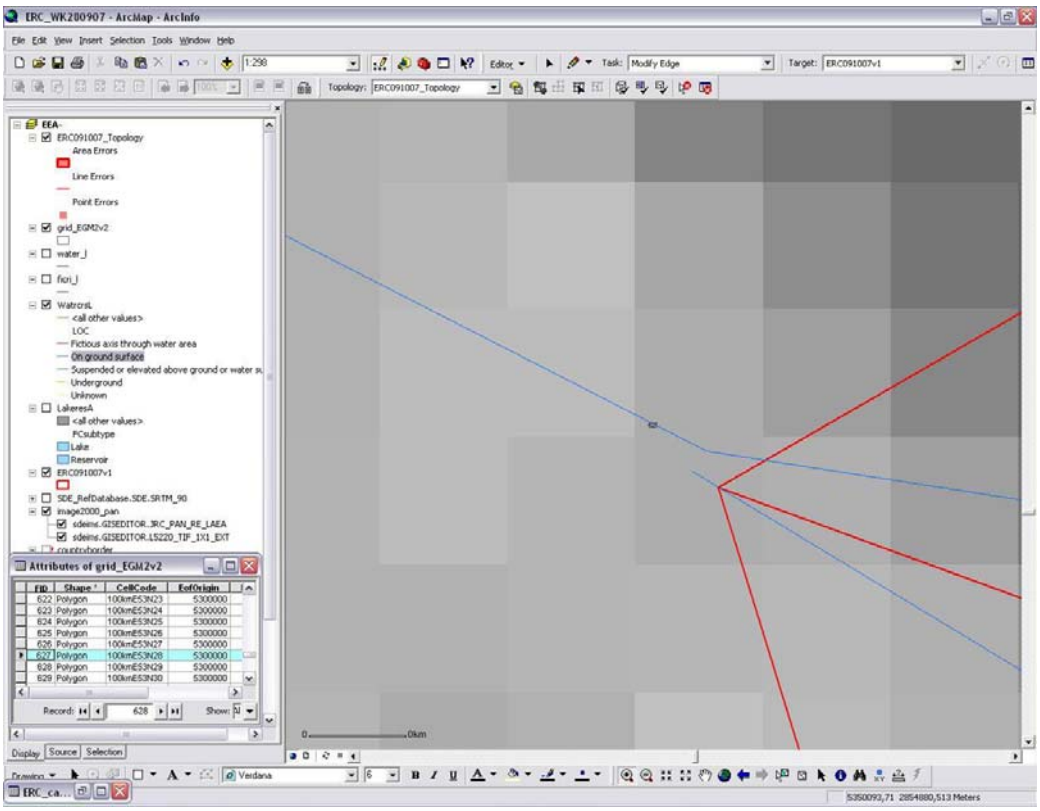
Another common problem to take into account is that there are high amounts of rivers mouth that for some countries are far away to touch the coastline and in other cases the river lines cross the coastine sea inside.

Cell 627

- We have 2 different rivers Tiza and Iza
- Geometrically are not connected and the distance in between the 2 rivers is of 3 meters...



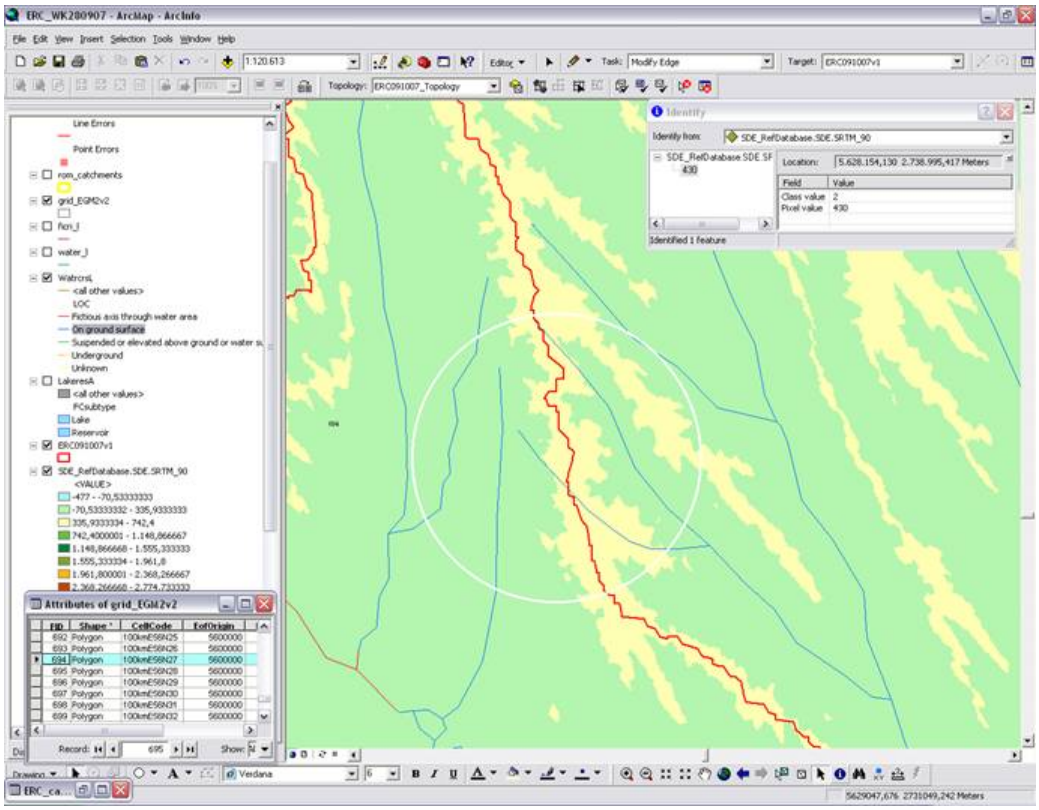




Result: We have not corrected it. Over Tisa River and its tributary river Iza there is a bridge and a road near the Romanian city of Sighetu Marmatiei.

Cells 694

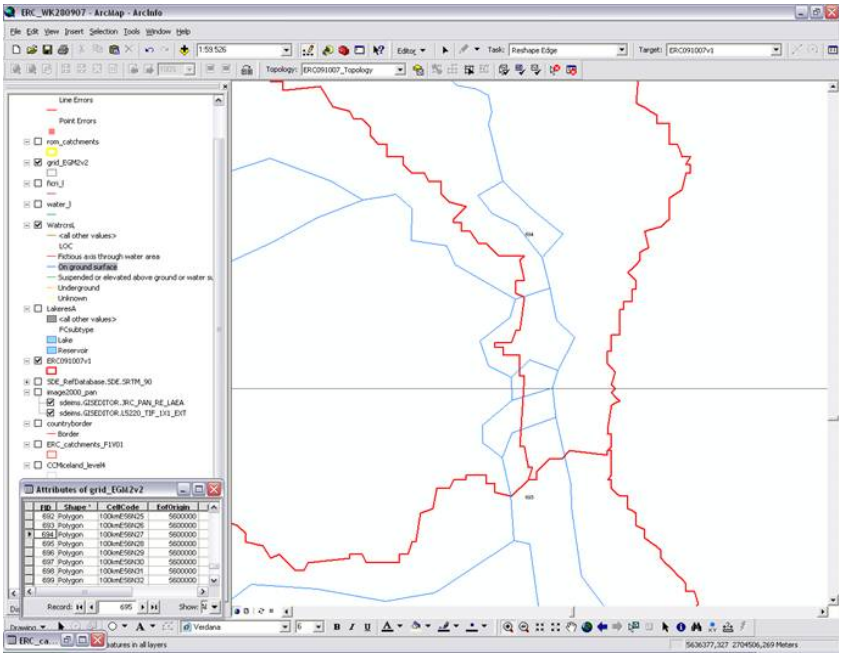
Using the different DTM and DEM from the EEA and ETCLUSI there are some rivers “crossing” mountains, in this case from cell 694 the river is crossing an altitude of 430 m, the terrain is not calcareous.



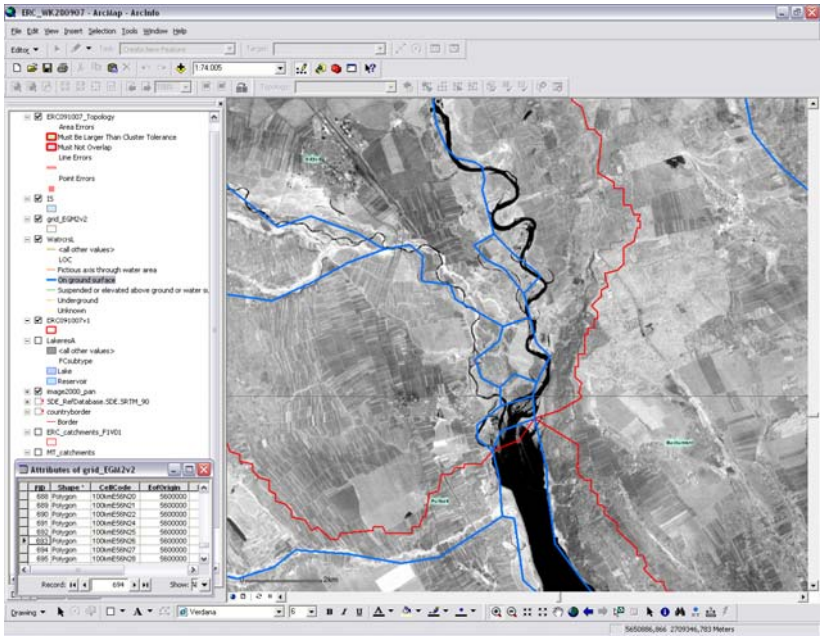
NB! This error was modified, even being a mistake, because in these cases rivers are not changeable.

Cells 694 – 693

Some problems have been found in the river's mouth or in plain areas where the river talweg has been interpretated in a "non clear" way. The problem found in between the cells 694 and 693 is just an example.

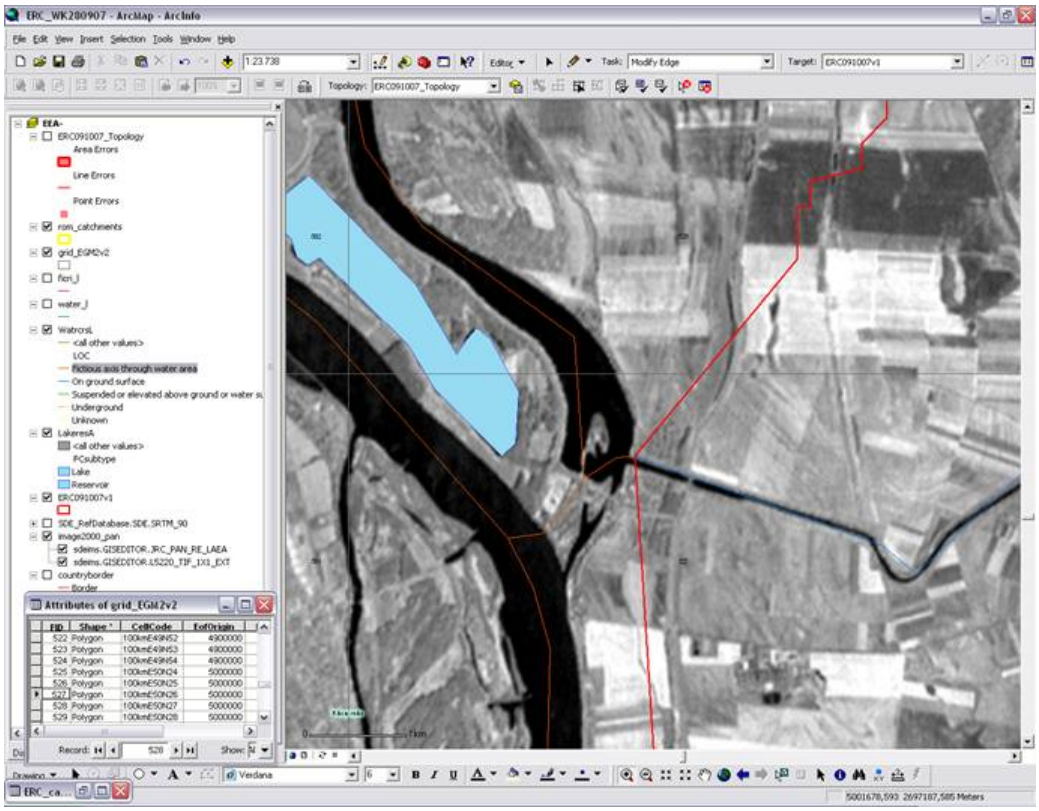


This example shows again that EGM is not using a homogeneous methodology to interpretate river lines, and that there are no expert advices in order to understand and re-create river system environments.



Cell 527

There are cases where non modified rivers have been identified as “Ficticious Rivers”, the cell 527 shows an example:



6 ANNEX

- ERC161107v1 GeoDataBase
- ERC draft map
- Location grid