Dataset

Merit DEM (Yamazaki et al. 2017)

<https://hydro.iis.u-tokyo.ac.jp/~yamadai/MERIT_DEM/>

3 arcsec data tiles combined to a European DEM (extend LISFLOOD EFAS)

EU-Hydro (Copernicus Land Monitoring Service)

<https://land.copernicus.eu/en/products/eu-hydro>

Shape files of river network. Rasterized by attribute Strahler to 3 arcsec European raster

Resulting river network on 3 arcsec:

Burned in EU-Hydro network to improve the natural DEM

* Merit DEM - 5x Strahler EU-Hydro
* Filled up with ArcGIS Hydro fill tool to make a hydrological sound DEM
* Flow direction tool from ArcGIS to create river network

Glofas

Run programs

1\_findMeritcoord.py

Using a high resolution upstream area dataset (here: Merit data DEM + EU\_hydro burned in)

to get the location of the station on a 3 arcsec network. The approach of Lehner (2008) and Burek and Smilovik (2023) is used here.

Input data:

**ups\_danube\_3sec.tif: Upstream area on 3 arcsec**

**metastation\_45.txt**: Gloafas calibration stations from Metadata\_calib\_stations\_Danube\_EFASv5\_GloFASv4.xlsx

Output: G**lofas\_Merit\_2.txt**

**metastation\_45.txt + high resolution location and upstream area**

2\_makeshape.py

Create high-res (3 arcsec) shape files of the basins.

Using the station points defined in 1\_findMeritcoord.py for creating the shapefiles.

Python library pyflwdir is needed

<https://pypi.org/project/pyflwdir/0.5.2/>

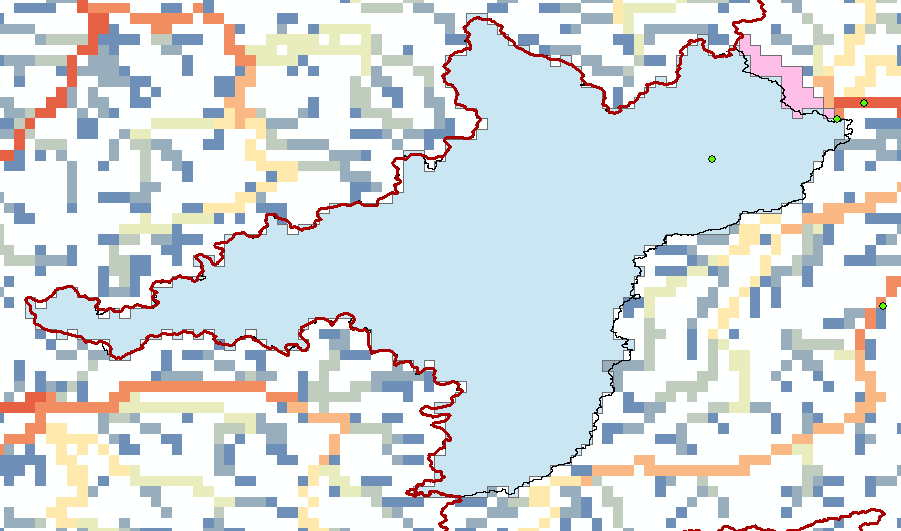
Input data:

G**lofas\_Merit\_2corr.txt (manual corrected output from** 1\_findMeritcoord.py)

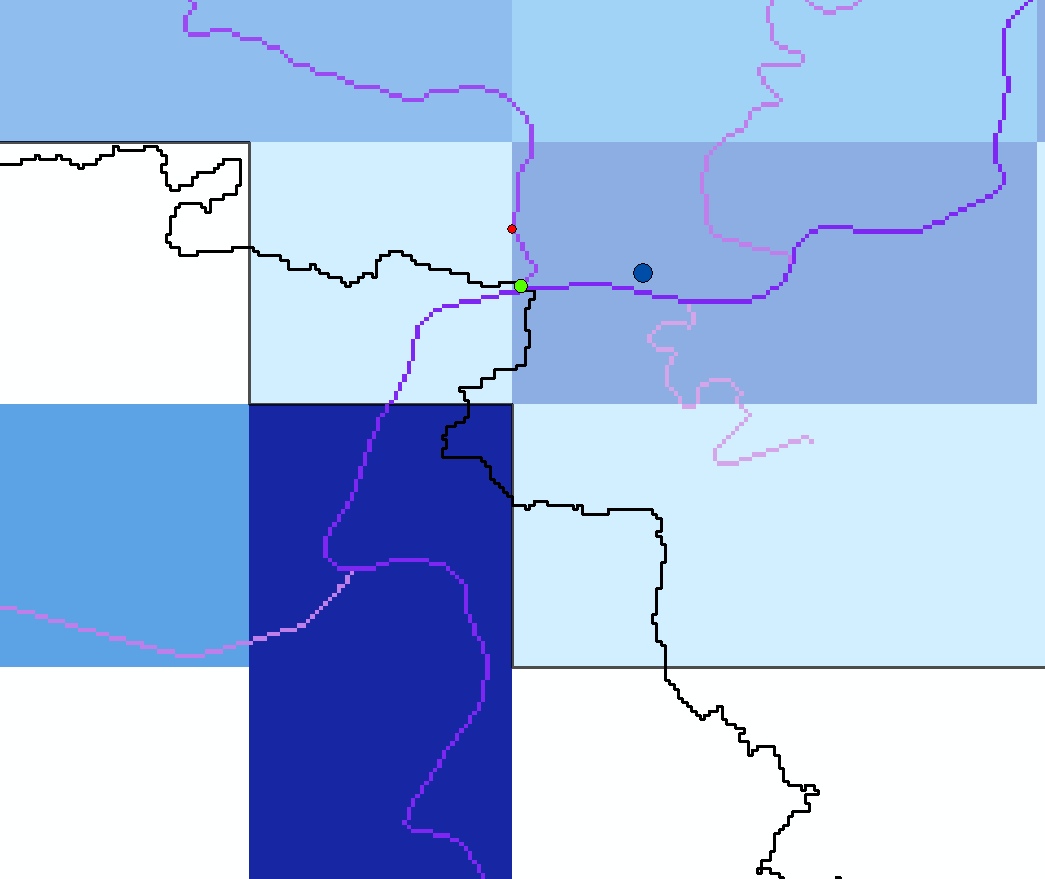
**danube\_fd.tif (3 arcsec river network)**

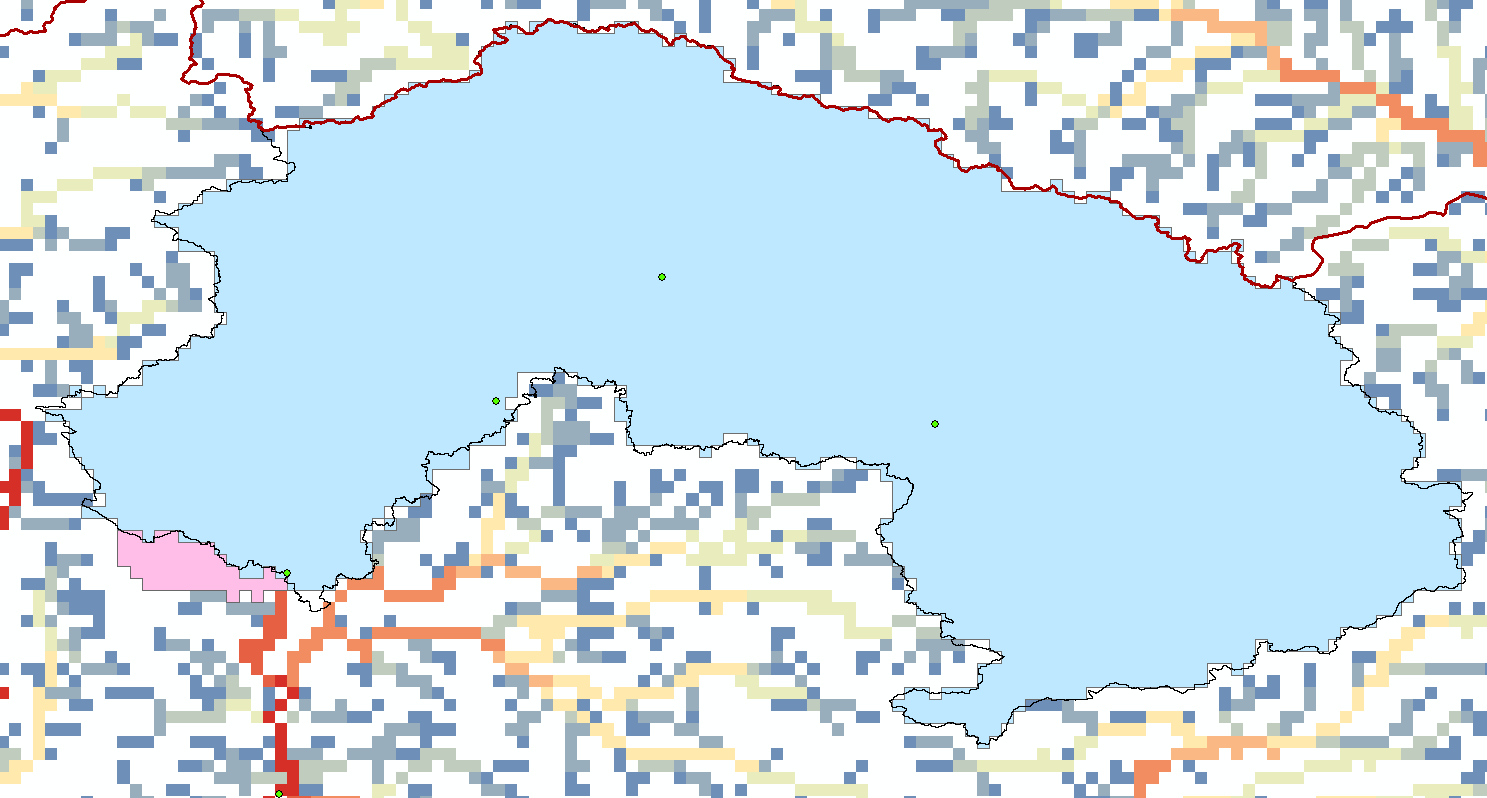
**Output:**

**../shape\_glofas\_3sec/ 3 arcsec shape file of station basin**

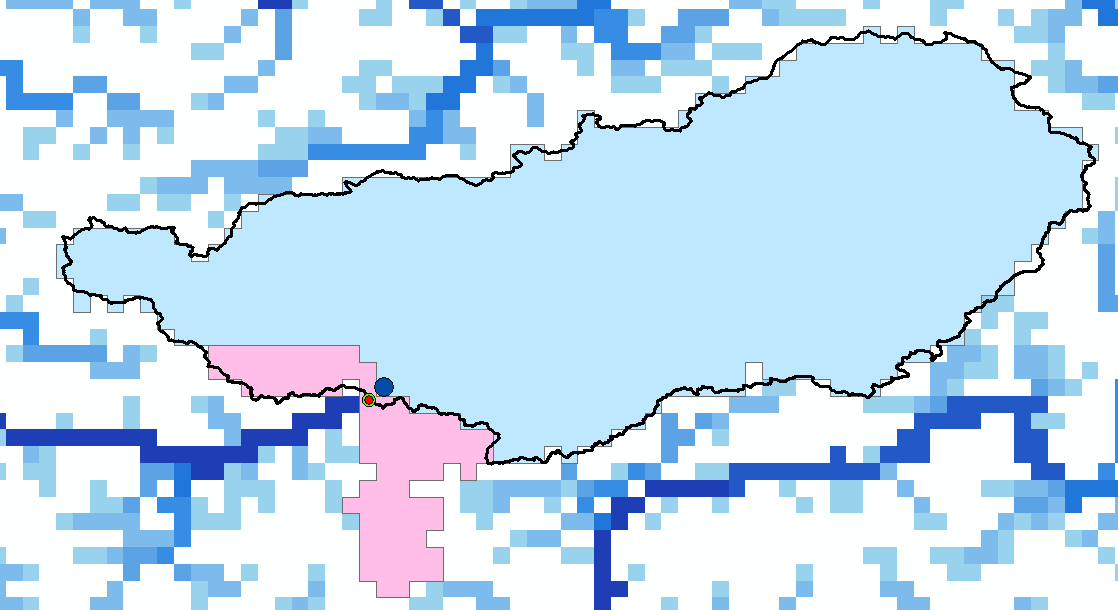


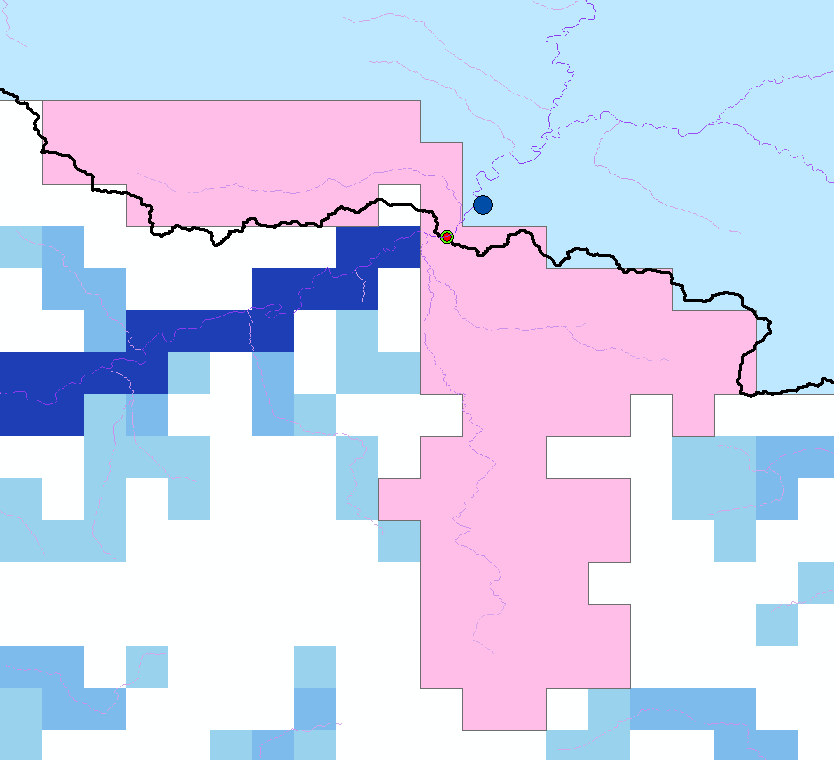
Station 0436





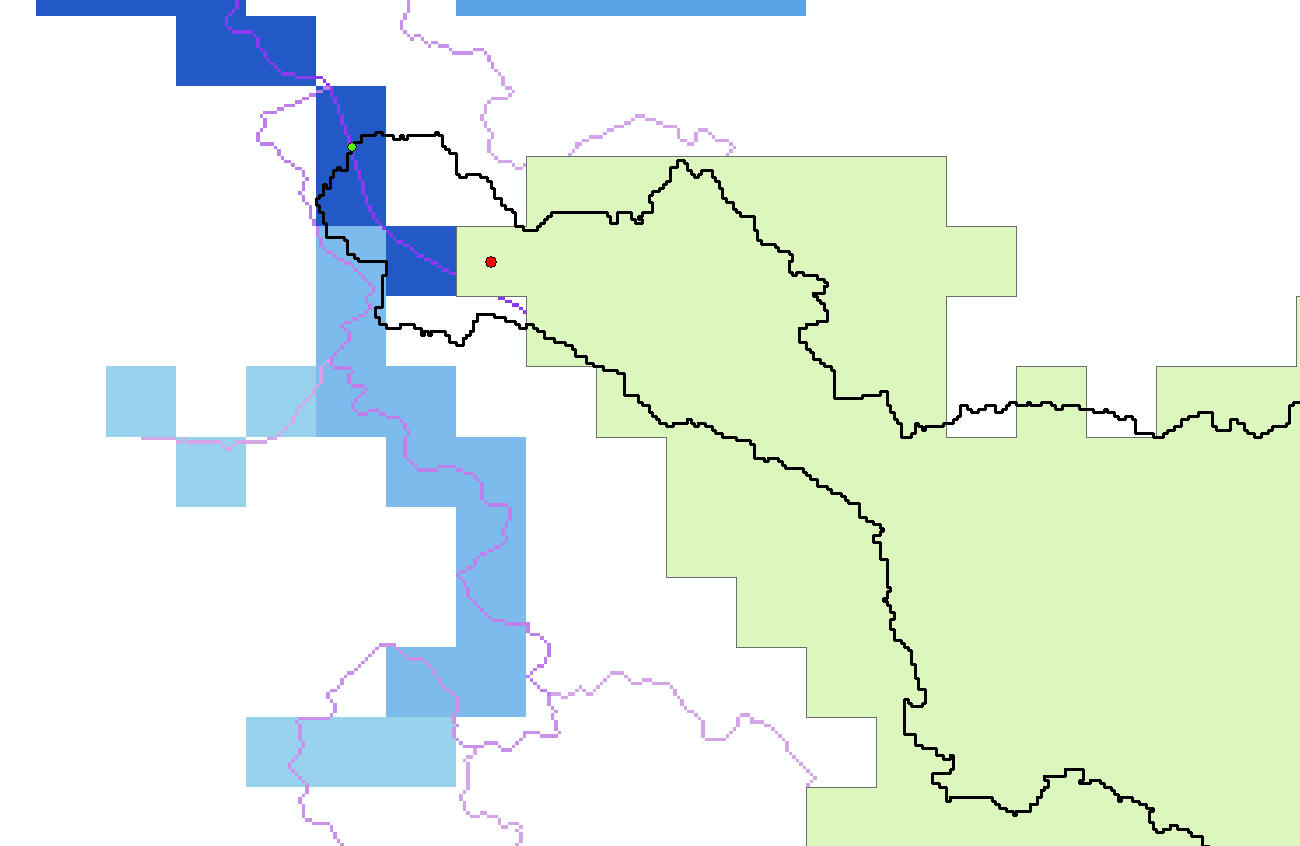
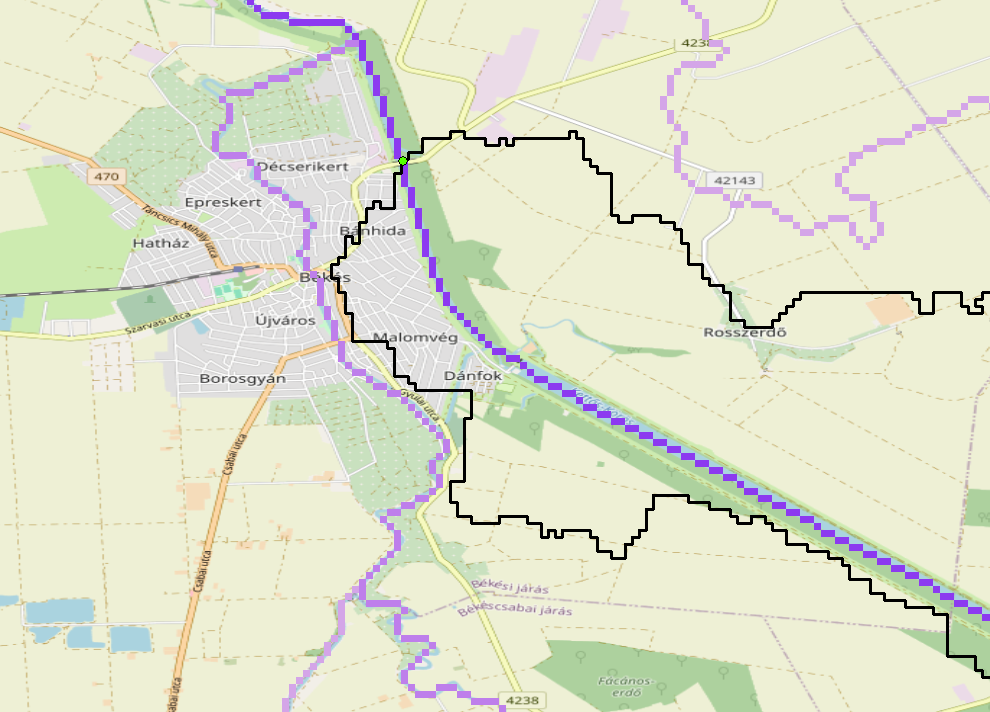
Station 517

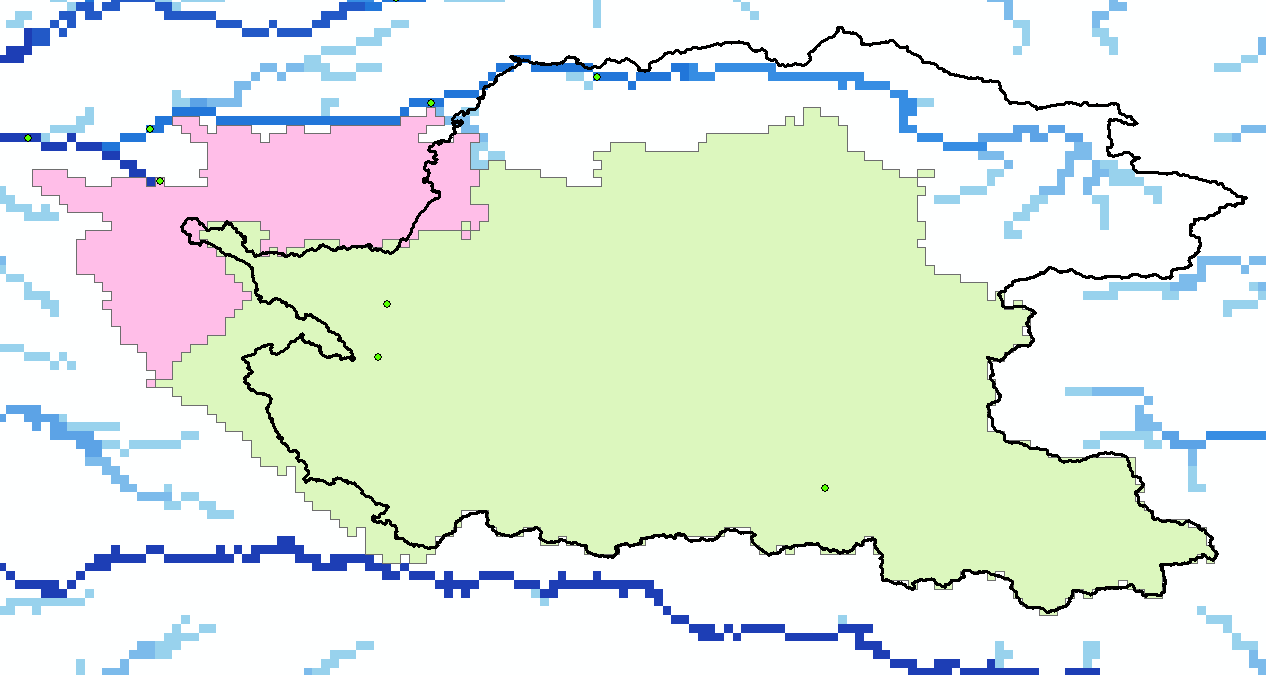




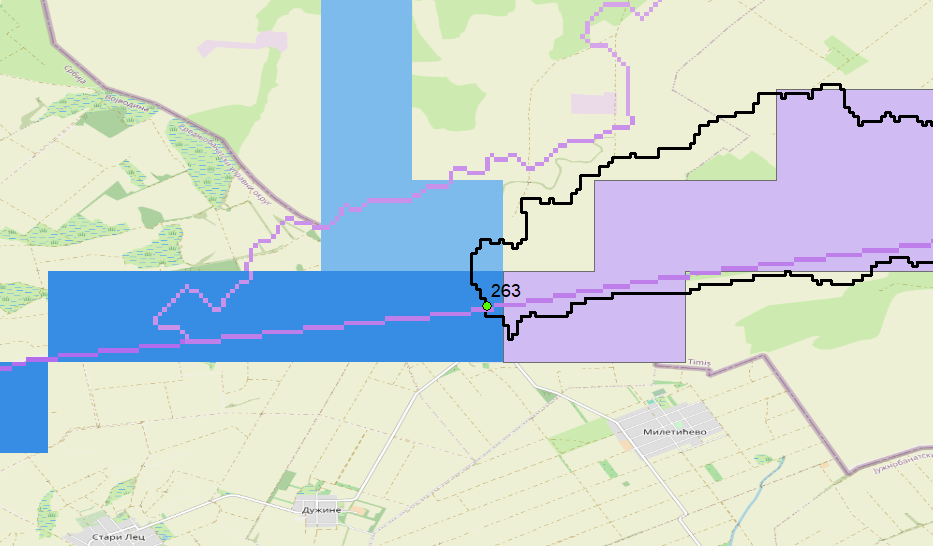
EFAS

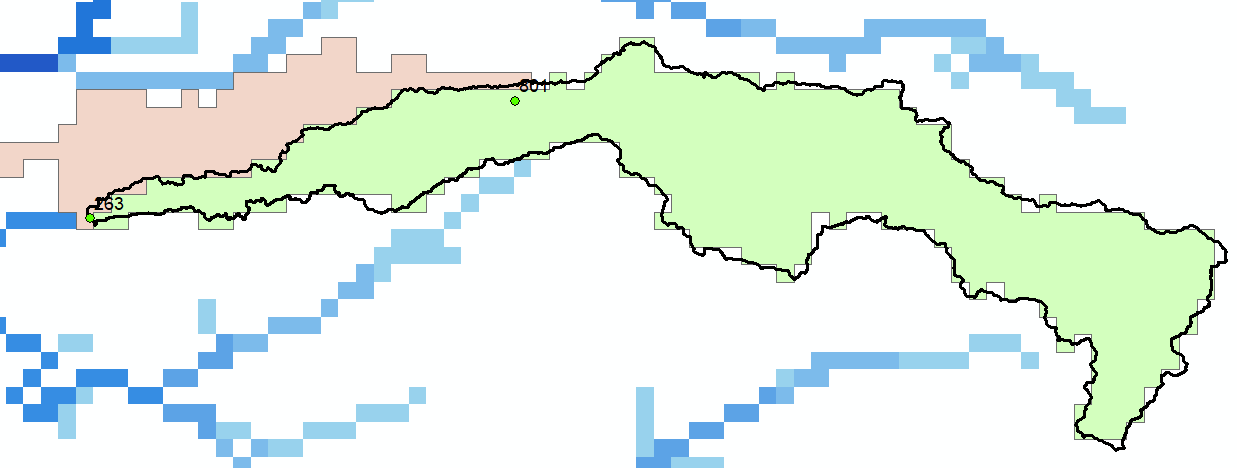
Bekes 660





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Yamazaki D., D. Ikeshima, R. Tawatari, T. Yamaguchi, F. O'Loughlin, J.C. Neal, C.C. Sampson, S. Kanae & P.D. Bates A high accuracy map of global terrain elevations Geophysical Research Letters, vol.44, pp.5844-5853, 2017 doi: 10.1002/2017GL072874