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BMU - Base Maps of Ukraine

OpenOttoman

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BMU-Description

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Base Maps of Ukraine

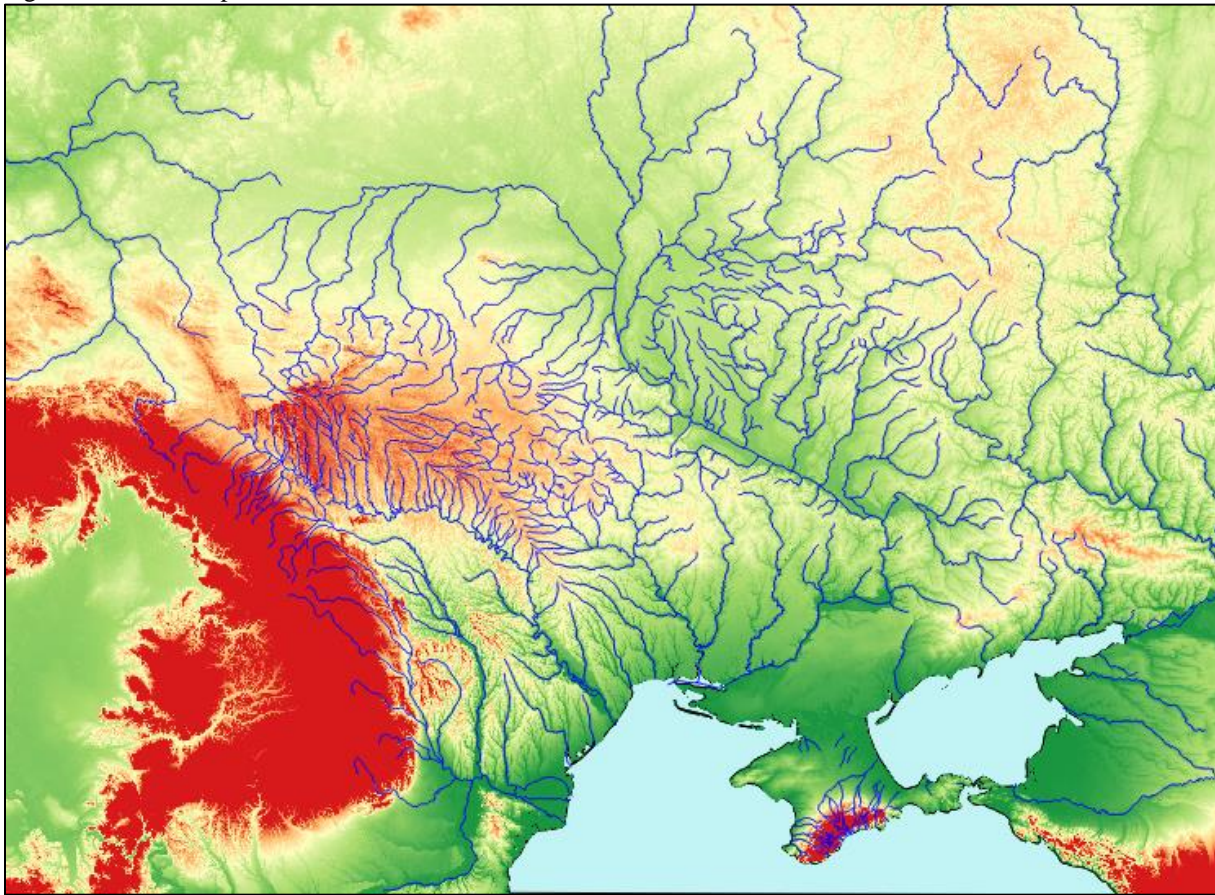
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The Base Maps of Ukraine (BMU) project has generated a set of base maps for Ukraine and the surrounding countries that can be used by GIS applications such as Google Earth, ArcGIS and QGIS. The set includes maps for rivers, terrain elevation, and terrain ruggedness¹. Also provided are land and water mass silhouettes that can be used as map backgrounds. This project overview starts with figures showing project maps, followed by citation of sources used to create the maps. Map database formats are then outlined, and an overview of how the GeoNames database was used for this project is provided. The article concludes with a description of the means of accessing the map and licensing terms for use of BMU materials.

Figure 1 shows the rivers included in the BMU project laid over the project's terrain elevation map. Figure 2 shows rivers laid over the terrain ruggedness map. Figure 3 shows the rivers map opened in Google Earth with a balloon opened for the Danube river (see below for an explanation of ID and PART_OF river attributes). River names are suppressed on these figures for the sake of image clarity, but are available in the downloadable files.

All maps were generated as GIS layers using QGIS (<http://www.qgis.org>). The land mass silhouette, water mass silhouette, and rivers maps were prepared by tracing shorelines and river courses as shown on Google maps (<http://www.google.com/maps>). River names were taken from the GeoNames database (<http://www.geonames.org>). Shuttle Radar Topography Mission data (<http://ita.cr.usgs.gov/SRTM1Arc>) was used for the terrain elevation map. Terrain ruggedness was calculated using the QGIS ruggedness index plugin.

Figure 1: Rivers map laid over terrain elevation.



¹ Riley, S. J., S. D. DeGloria and R. Elliot (1999). "A terrain ruggedness index that quantifies topographic heterogeneity", *Intermountain Journal of Sciences*, vol. 5, No. 1-4, 1999. The terrain ruggedness index reflects the difference in elevation values from a center cell to the eight cells immediately surrounding it.

Figure 2: Rivers map laid over terrain ruggedness.

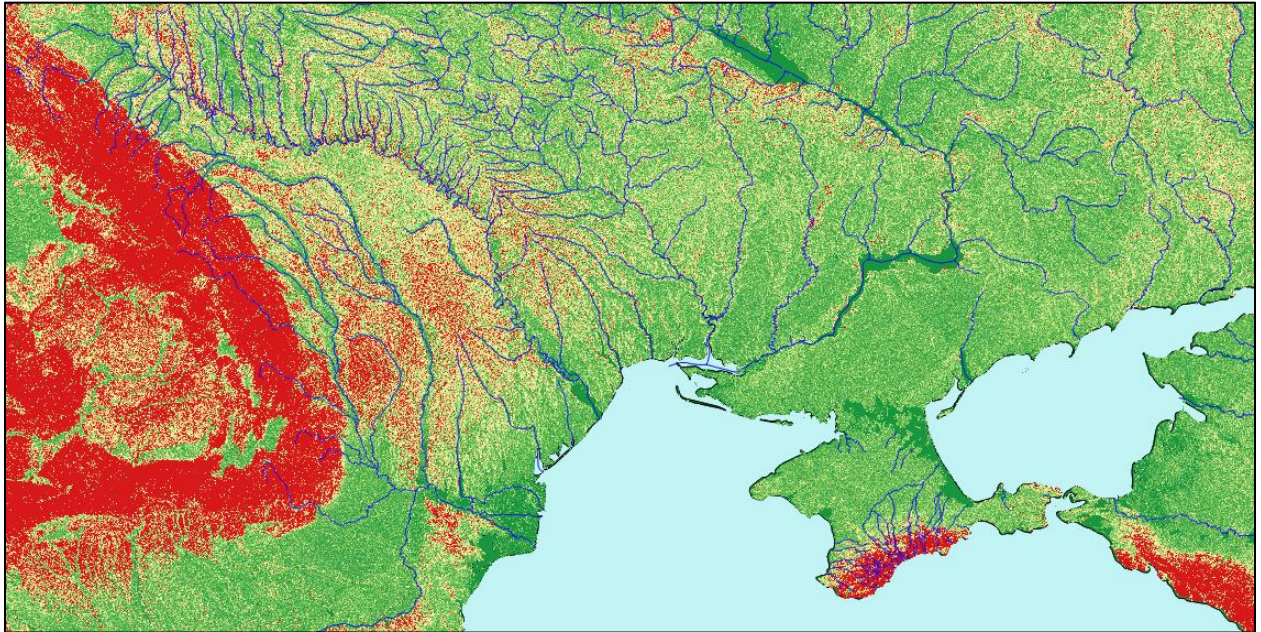


Figure 3: Rivers map opened in Google Earth.

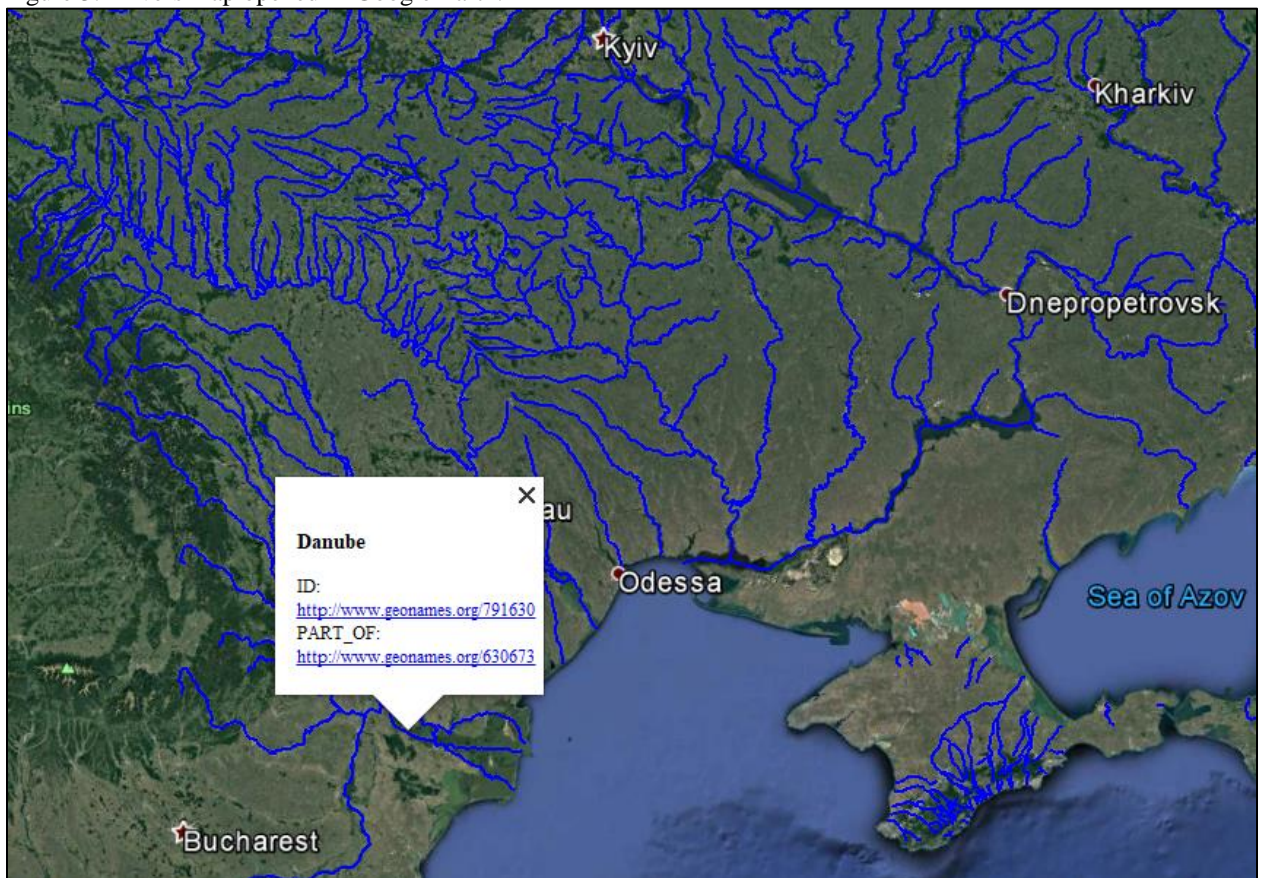


Table 1 shows the folders and formats that the base maps are stored in. The rivers, land, and water .zip folders contain shape files and all associated files needed to load the layers into GIS applications such as QGIS and ArcGIS. The rivers .kml file can be opened in applications such as QGIS, ArcGIS, and Google Earth.

Table 1: Base map folders and formats.

Folder	Format
BMU-Rivers-SHP.zip (2.3 MB)	.shp
BMU-Land-SHP.zip (31 KB)	.shp
BMU-Water-SHP.zip (43 KB)	.shp
BMU-Rivers-KML.kmz (1.5MB)	.kml
BMU-Elevation-TIF.zip (4.3 GB)	.tif
BMU-Ruggedness-TIF.zip (8.7 GB)	.tif

Table 2 shows the attributes of the rivers shape file. Each river has an ID and a name taken from the GeoNames database. The PART_OF field contains the ID of the source of each river. For example, the source of the river Al'ma is the Black Sea, which has the GeoNames ID <http://www.geonames.org/630673>. Note how this information is displayed in Figure 3.

Table 2: Rivers map shapefile attributes.

ID	GEONAMES	PART_OF
http://www.geonames.org/713523	Al'ma	http://www.geonames.org/630673
http://www.geonames.org/11468009	Alachuk	http://www.geonames.org/6996377
http://www.geonames.org/11468019	Alaka	http://www.geonames.org/630673
http://www.geonames.org/6986390	Anhara	http://www.geonames.org/694895

GeoNames is a geographical database accessible free of charge under a Creative Commons attribution license. To create the river attributes of Table 2, the full GeoNames database was downloaded for the countries covered here, all features except rivers were stripped out of the database, and the database was loaded into QGIS over the Google Physical map layer. An example of the result is shown in Figure 4. The figure shows the GeoNames database fields for the Strypa and Dniester rivers, where field_1 contains the GeoNames ID of the river, field_2 contains the primary name used by GeoNames, and field_3 shows alternate names for the feature. When turned into a url (e.g. <http://www.geonames.org/692375> for Strypa river), the url can be opened in a web browser as shown in Figure 5.

The folders shown in Table 2 are downloadable from the project repository at http://publications.marquette.edu/ottoman_ukraine. All BMU materials are available under a Creative Commons Attribution 4.0 International (CC BY 4.0) license (<https://creativecommons.org/licenses/by/4.0/>). Per the license, you may copy and redistribute the material in any medium or format, and may remix, transform, and build upon the material for any purpose. If you do so, you must give appropriate credit by referencing the BMU project repository and indicate if changes were made to the materials. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

Figure 4: GeoNames database laid over Google Physical map opened in QGIS.

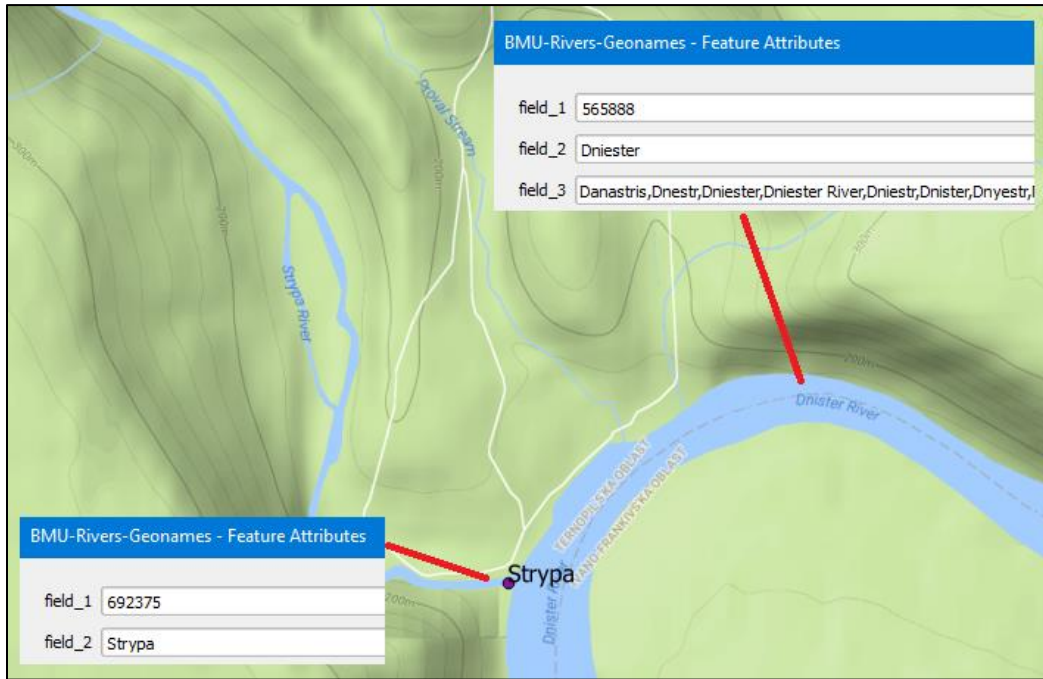


Figure 5: Strypa river ID (<http://www.geonames.org/692375>) opened in a web browser.

