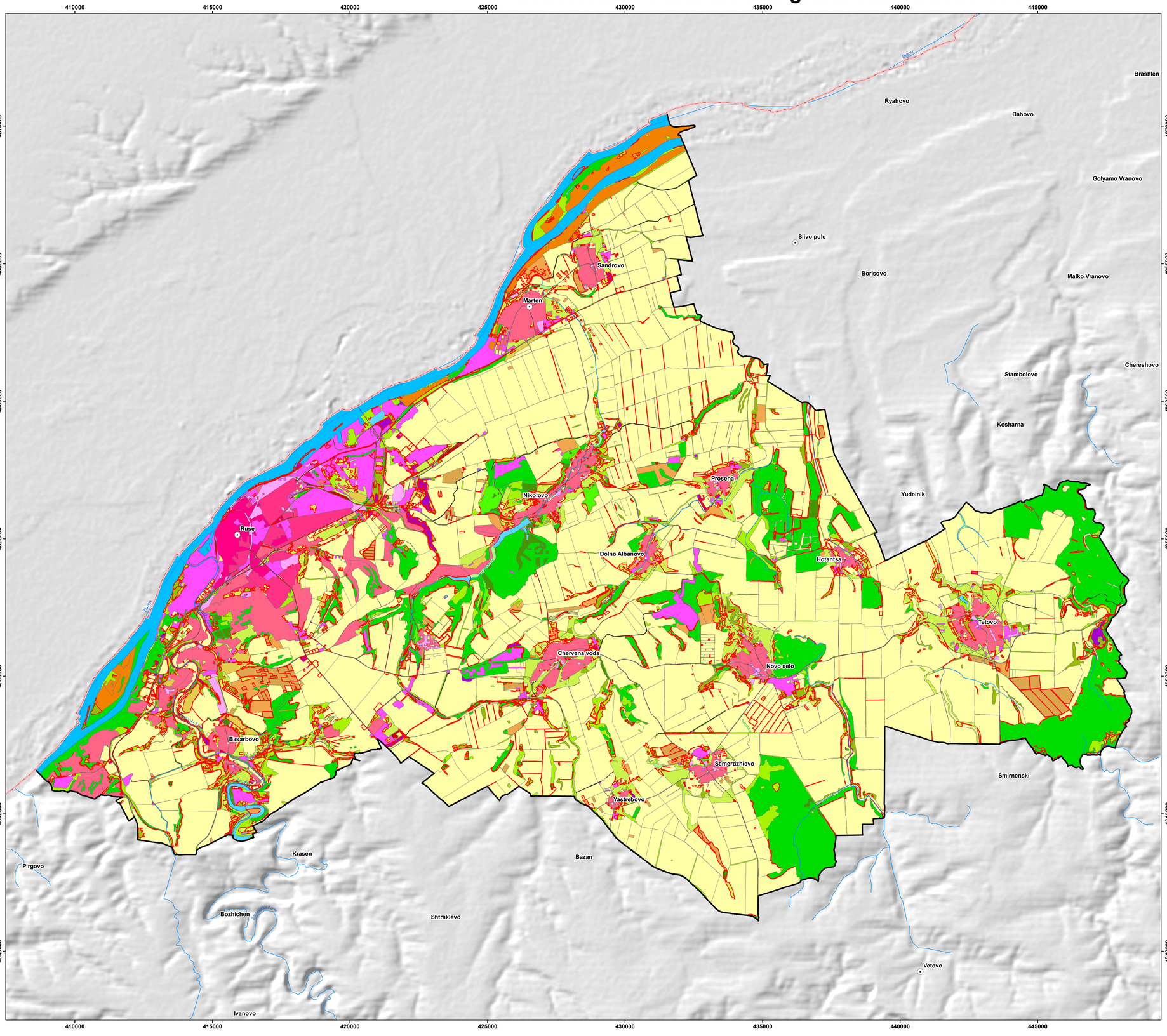
Monitoring Land Cover (LC) changes based on the analysis of integrated data from the European COPERNICUS Program, aero ortho-photo and field data in accordance with the new global standard ISO 19144



Legend:

Base Layers

- State Border
- Municipal Boundary
- Rivers

Settlements

- City
- Town

LC changes mun. Ruse 2013-2023

Land Cover mun. Ruse 2013

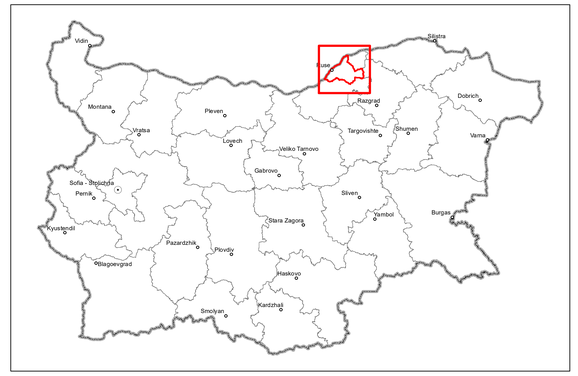
- 1 (A) Arable land
- 2 (G) Managed grassland
- 3 (R) Paddy rice field
- 4 (N) Natural grassland
- 5 (T) Tree crop
- 6 (P) Tree plantation
- 7 (BDF) Broadleaf deciduous forest
- 8 (BEF) Broadleaf evergreen forest
- 9 (CF) Coniferous forest
- 10 (BCF) Mixed broadleaf and coniferous forest
- 11 (WLF) Waterlogged forest
- 12 (WD) Woodland
- 13 (UV) Urban vegetated areas
- 14 (AHT) Association of herbaceous and woody crops
- 15 (ACT) Association of crops and natural trees
- 16 (S) Shrub crop
- 17 (SL) Scrubland
- 18 (WV) Waterlogged vegetation
- 19 (UN) Artificial non-build up surface
- 20 (UBC) Continuous urban fabric
- 21 (UBD) Discontinuous urban fabric
- 22 (FUF) Fragmentary urban fabric
- 23 (UBS) Artificial build up surface
- 24 (UBN) Artificial build up network
- 25 (BSC) Consolidated bare surface
- 26 (BSN) Unconsolidated bare surface
- 27 (RVR) Rivers
- 28 (CHN) Channels
- 29 (WR) Reservoirs
- 30 (WL) Lakes and impoundments
- 31 (CAG) Covered agriculture land (Greenhouse)

Class_ID	Class_EN	Class_BG	2013 Area [ha]	2023 Area [ha]	Dif 2023-2013
1	Arable land	Обработваеми земи	31 113.0	31 363.4	250.4
2	Managed grassland	Обработваеми (засаждани) треви	19.0	26.7	7.7
3	Paddy rice field	Оризища	-	-	-
4	Natural Grassland	Треви	2 660.9	1 912.3	-748.6
5	Tree crop	Насаждения от плодни дървета	519.3	462.6	-56.7
6	Tree plantation	Насаждения от неплодни дървета	650.0	649.0	-1.0
7	Broadleaf deciduous forest	Широколистни листопадни гори	5 973.6	6 439.7	466.0
8	Broadleaf evergreen forest	Широколистни вечнозелени гори	-	-	-
9	Coniferous forest	Иглолистни гори	196.8	199.0	2.2
10	Mixed broadleaf and coniferous forest	Смесени широколистни и иглолистни гори	148.0	154.3	6.3
11	Waterlogged forest	Постоянно заблатени гори	-	-	-
12	Woodland	Дървета храсти и трева	2 655.9	2 743.4	87.6
13	Urban vegetated areas	Градска растителност	323.5	322.3	-1.2
14	Association of herbaceous and woody crops	Асоциация от тревисти и дървесни земеделски култури	3.1	3.1	0.0
15	Association of crops and natural trees	Асоциация от земеделски култури и естествени дървета	227.9	222.7	-5.2
16	Shrub crop	Насаждения от плодни храсти	575.0	259.8	-315.2
17	Shrubland	Храсти и трева	950.1	1 225.9	275.7
18	Waterlogged vegetation	Постоянно заблатена тревиста и храстова растителност	72.7	84.9	12.2
19	Artificial non-build up surface	Изкуствени/антропогенни незастроени площи	248.2	209.0	-39.3
20	Continuous mosaic urban fabric	Плътна мозаечна урбанизирана структура	300.3	301.2	0.8
21	Discontinuous urban fabric	Неплътна урбанизирана структура	2 897.0	2 914.3	17.3
22	Fragmentary urban fabric	Фрагментарна урбанизирана структура	516.8	516.9	0.1
23	Artificial build up surface	Изкуствени/Антропогенни застроени площи	1 901.7	1 974.2	72.4
24	Artificial build up net-work	Изкуствени/Антропогенни застроени линейни обекти	472.7	480.1	7.4
25	Consolidated bare surface	Консолидирани естествени голи повърхности	19.9	19.8	-0.1
26	Unconsolidated bare surface	Неконсолидирани естествени голи повърхности	12.6	5.8	-6.8
27	Rivers	Реки	1 681.3	1 665.2	-16.1
28	Channels	Канали	36.8	36.8	0.0
29	Reservoirs	Язовири	52.0	37.0	-15.0
30	Lakes and impoundments	Езера и водоеми	72.1	70.6	-1.4
31	Covered agriculture land (Greenhouse)	Оранжерия	13.3	13.6	0.3
		TOTAL:	54 313.5	54 313.5	

Projected Coordinate System: WGS 1984, UTM, zone 35N

0 1 2 4 6 8 10 km

N



The Ruse Municipality map is created under HORISON EUROPE project NBSINFRA–101121210"Nature-Based solutions (NBS)", aiming to monitor trends and safeguard sustainable territorial management and critical infrastructure against both natural and human-induced hazards, under the European program – HORISON EUROPE.

The map is based on processed satellite data from Sentinel-2 (2013), till (2023).The Interpretation of the satellite images/data has been carried out on the basis of an established methodology, developed jointly with experts from the European Commission (DG JRC).

A number of different trends and changes were identified, both in urbanized areas and in agricultural and natural areas.

The amount of data is enormous and requires significant time and resources to be analyzed and evaluated in a proper and objective manner. The results can be diverse—ranging from the assessment of land cover/land use changes to the conservation levels of natural resources, such as green infrastructure and soil quality; from the evaluation of ground subsidence and the risks posed to urbanized areas and critical infrastructure; they may also include identifying lost infrastructure networks and assessing the impact of implementing Nature-Based Solutions (NBS).

Our task was to establish the monitoring tool and then if the local administration or stakeholder need some more detailed results from the databases and methodology we can provide them with the answer.

The classification is based on the UN FAO classification system –LCCS and in accordance with ISO 19144-2(LCML).