

CLIMAAX Toolbox

Na základe stretnutia v Katalánsku:

1. Zistiť čo jednotlivé piloty potrebujú (nie len Heat-Wave)
2. Na základe požiadaviek pripraviť toolbox
3. Toolbox by mal používať primárne verejne dostupné údaje, mal by byť prispôsobený na doplnenie lokálnymi údajmi
4. Toolbox sa otestuje s pilotmi
5. Na základe spätnej väzby od pilotou bude toolbox upravovaný
6. Vznik finálnej verzie

Heat-wave Žilina:

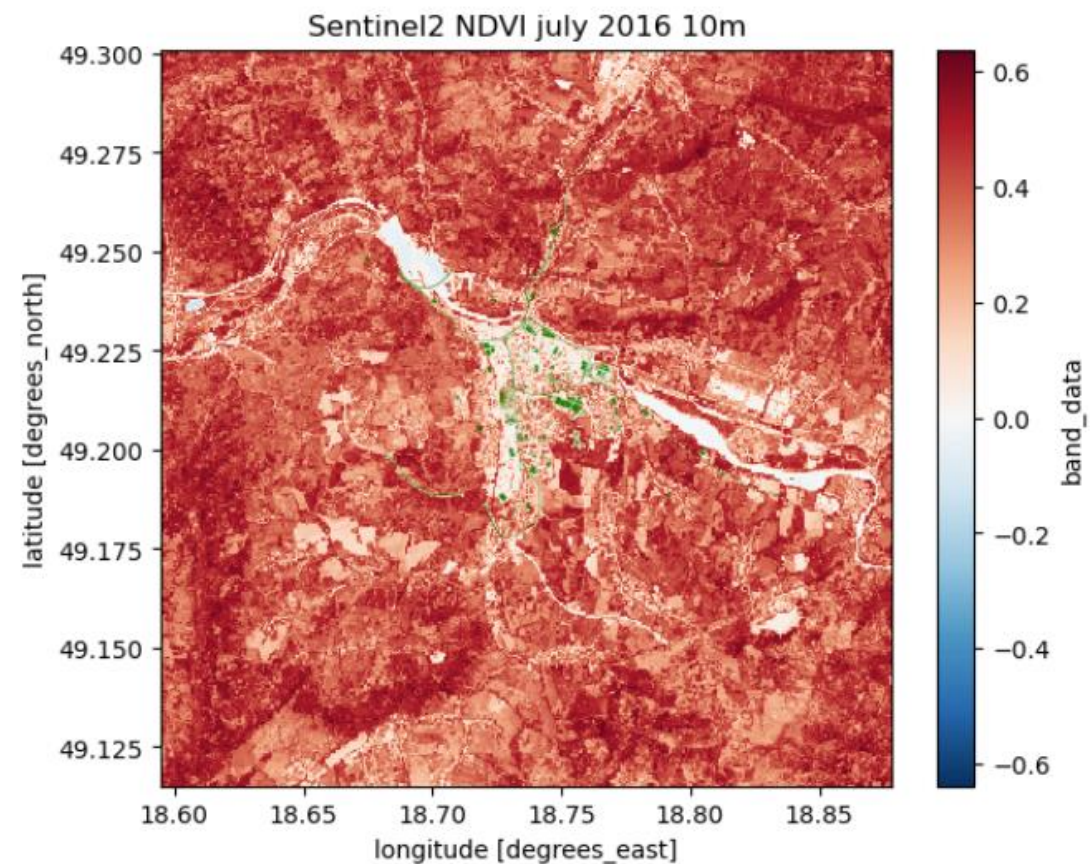
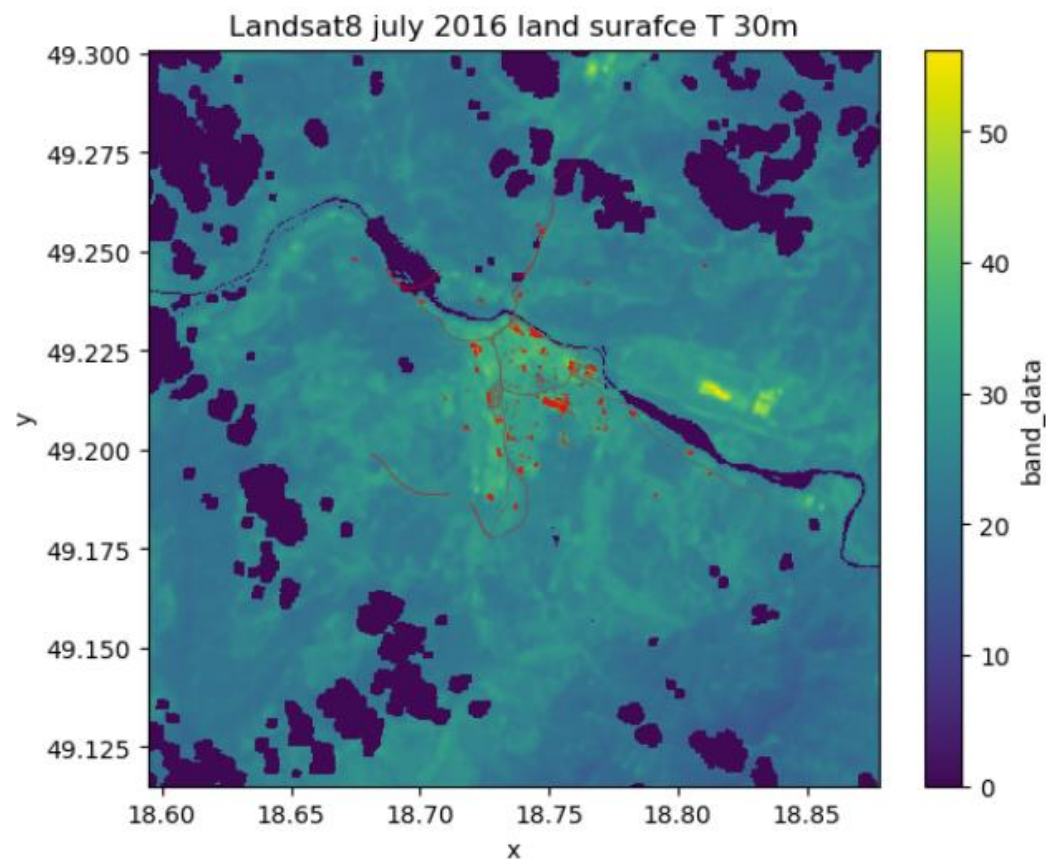
Otázky, ktoré už vieme zodpovedať:

- **Kde môžeme očakávať riziko?** Pozorované údaje z minulosti o teplote zemského povrchu[L8 LST 30m zadarmo].
- **Ako často?** Klimatické scenáre [Euro-Cordex 11km denné údaje, Euro-Corde Heat-wave (len pre vybrané mestá Žilina nie) cez ECMWF API, Chelsa 1km zadarmo]
- **Ako zabrániť?** Dáta pre adaptáciu na zmenu klímy [Sentinel2 10m zadarmo], Vegetačné charakteristiky NDVI, NDBI, NDDI, NDWI lokalizácia miest bez vegetačného krytu.
- **Lokálne údaje** (kritická infraštruktúra, dáta zo senzorov...)

Dáta:

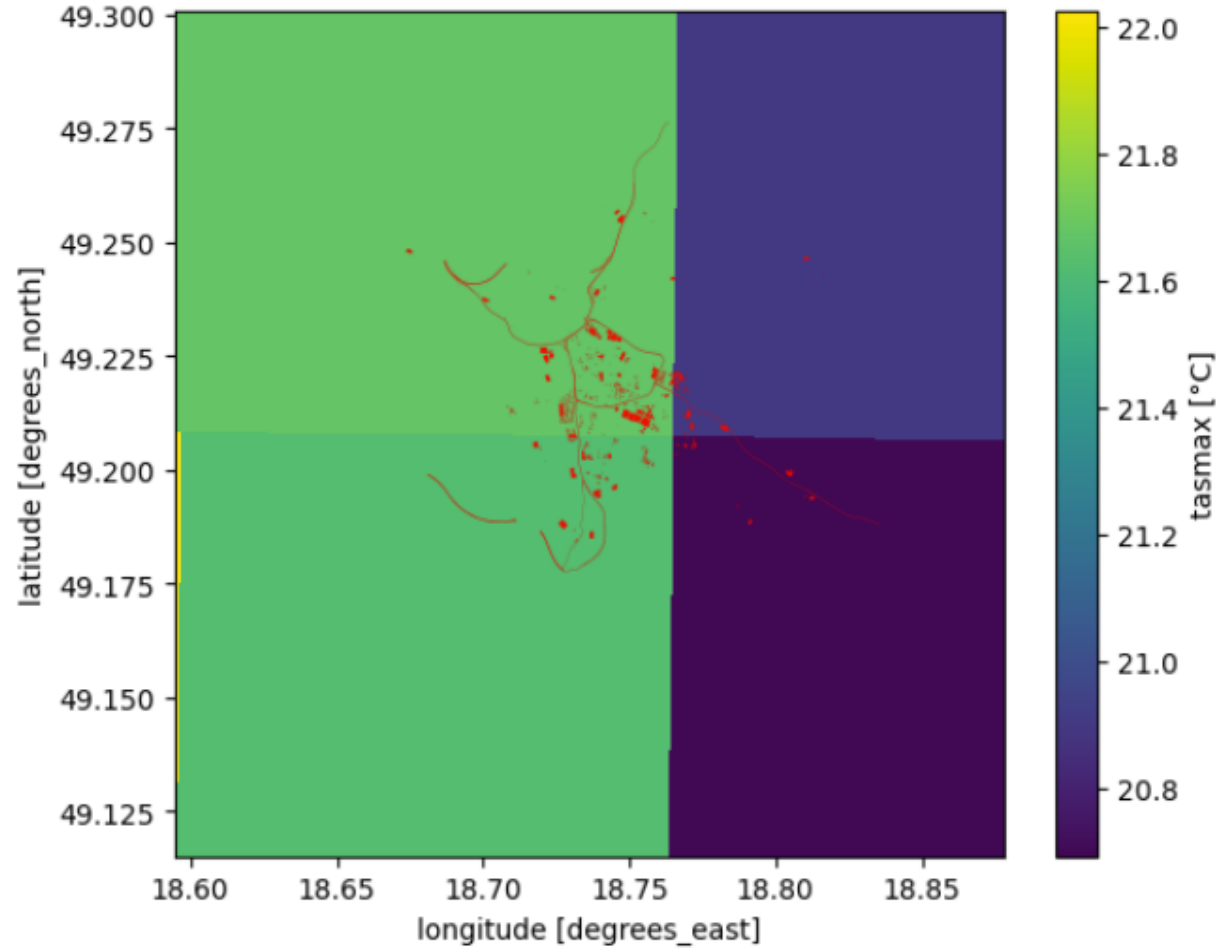
- **Euro-Cordex** – scenáre – teplota vzduchu v 2m pre roky 2026-2100, **11km gride** v dennom časovom kroku, rozlíšenie nie je vhodné pre mestá.
- **Chelsa** scenáre downscalované (1km grid; mesačné hodnoty, denné už sú témou jednání) **v súčasnosti sa pracuje na downscalingu**
- **Sentinel2**- dáta o hustote a stave vegetácie (10-20m grid; časový krok 5-10 dní) (NDVI, NDWI, LAI, NDDI, NDBI) ###
- **Landsat8**- teplota zemského povrchu 2016-2020 (15-30m grid; časový krok 8-16 dní) ###

Pozorované údaje:

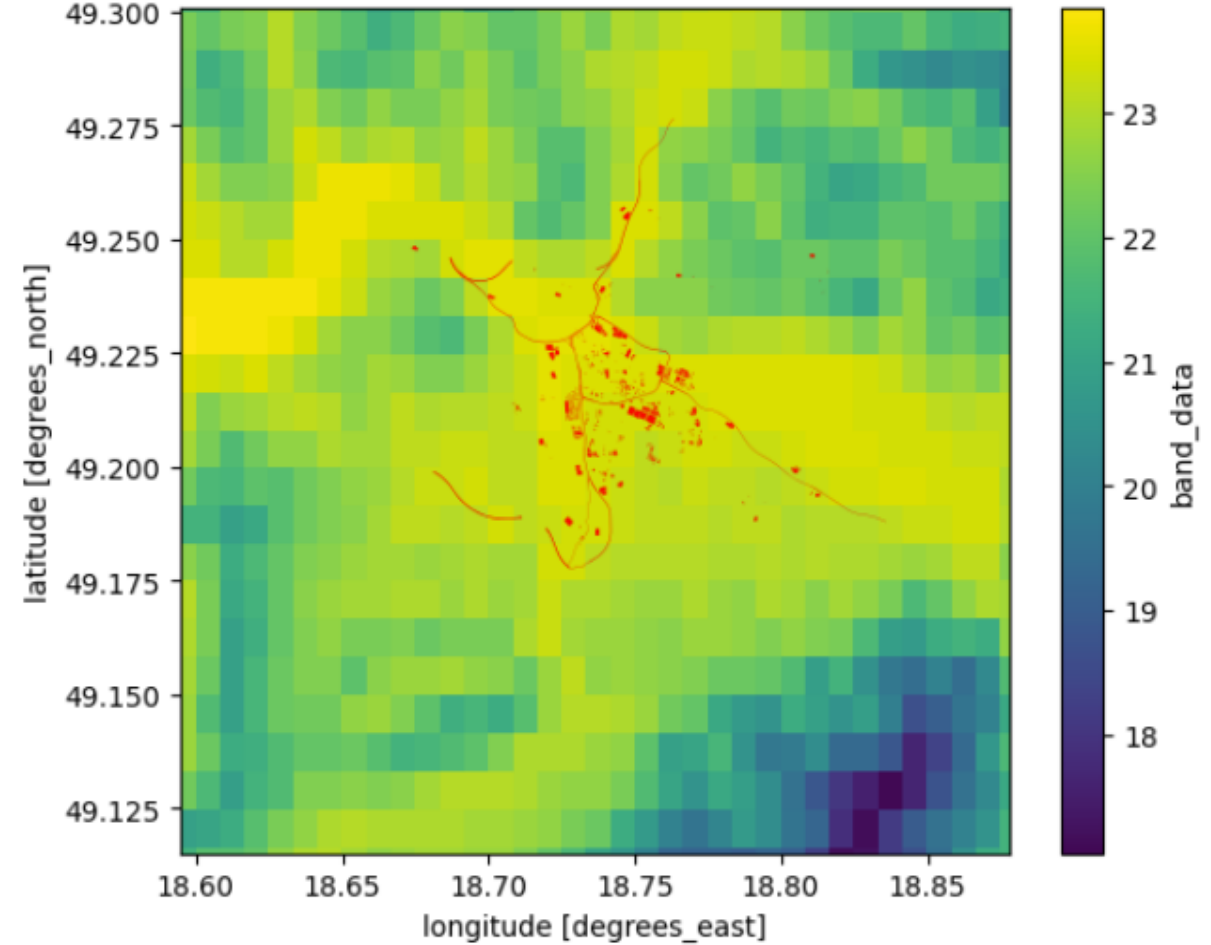


Klimatické Scenáře:

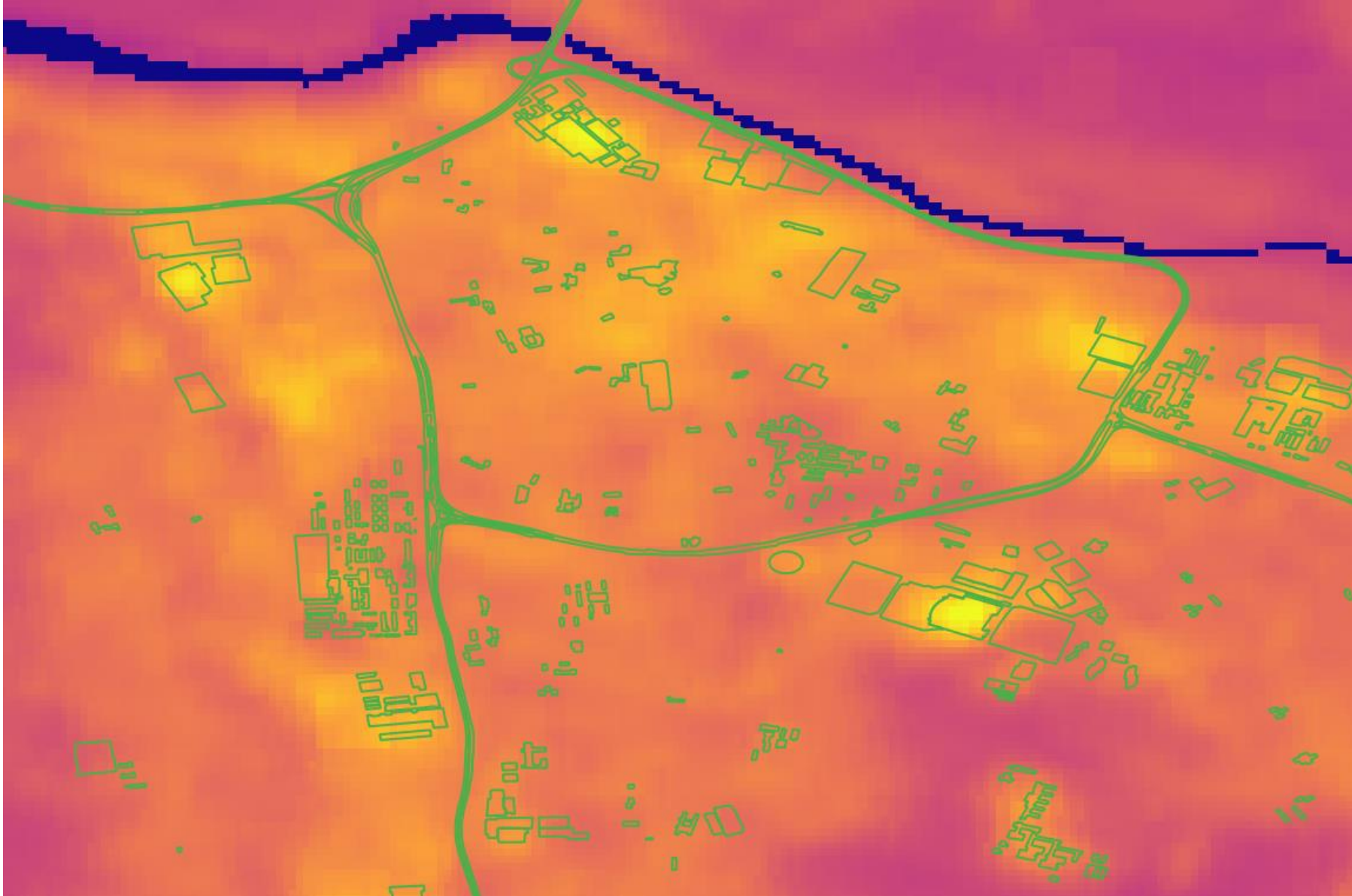
Euro-Cordex July avg max daily air T 1km



Chelsa July avg max daily air T 1km

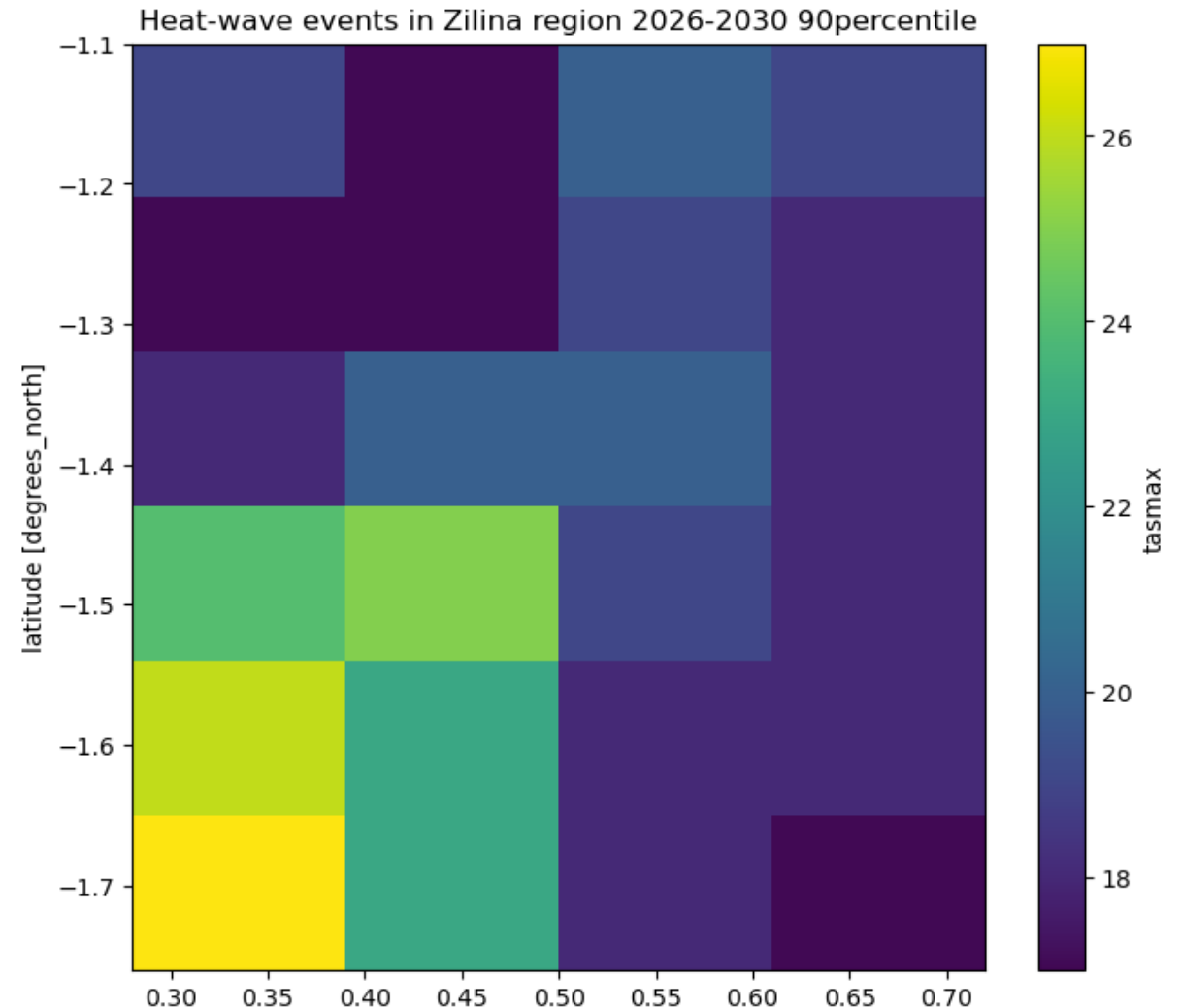
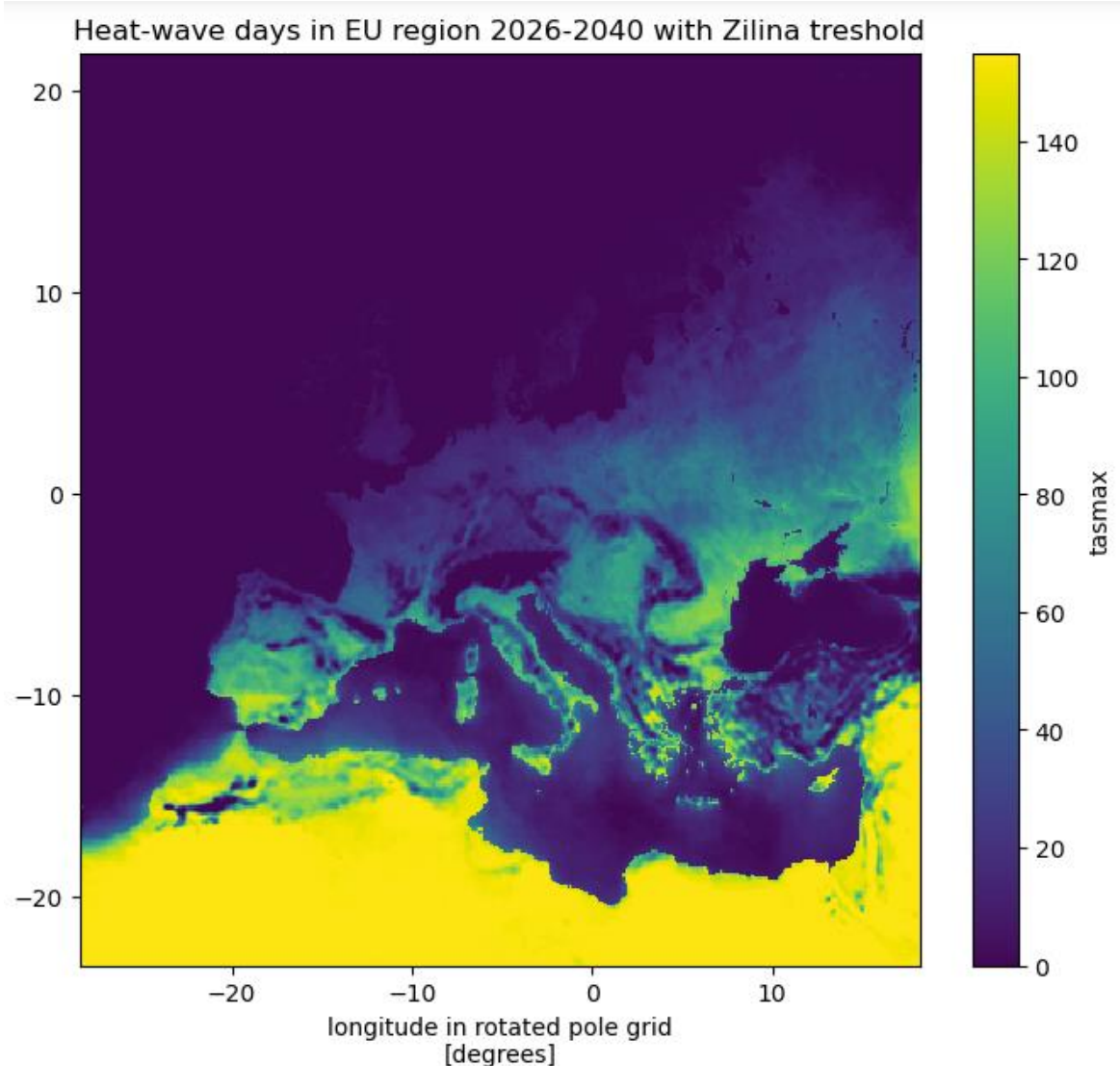


Identifikácia miest, ktoré sú prehrievané LS8:



Výskyt Vln horúčav (Heat-wave):

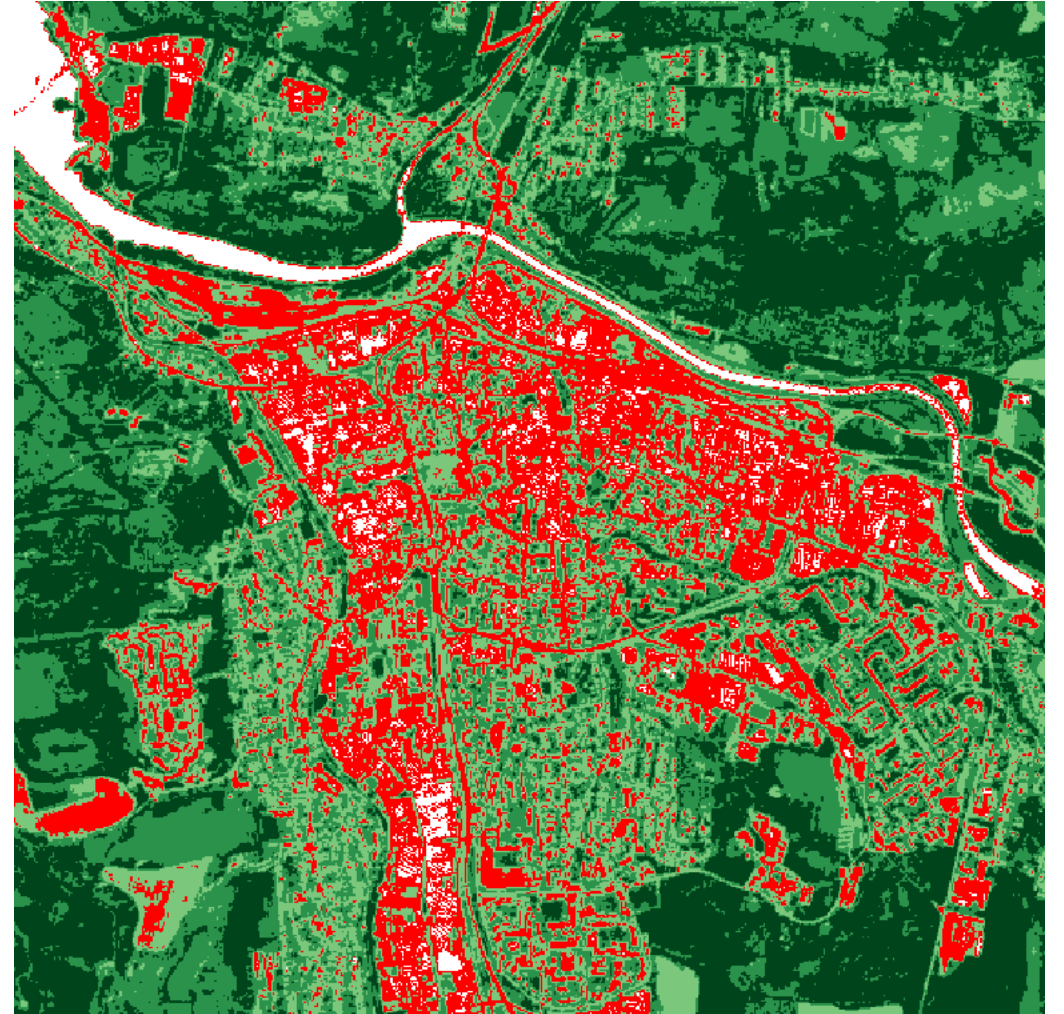
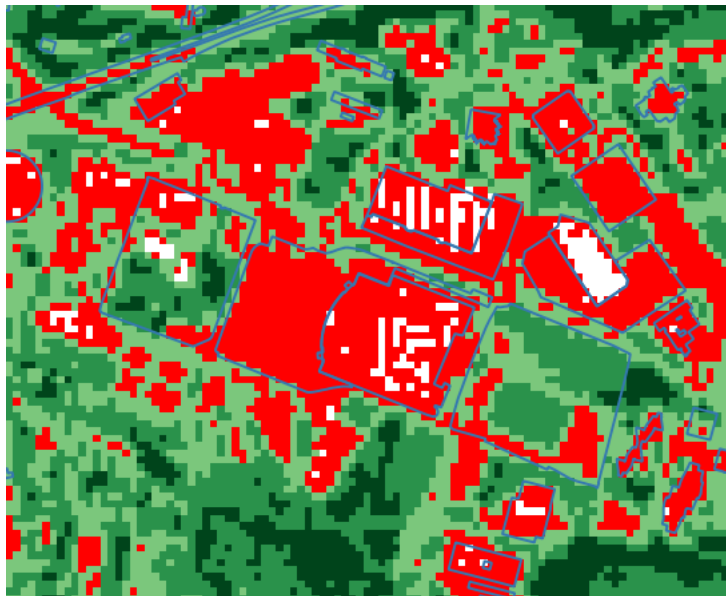
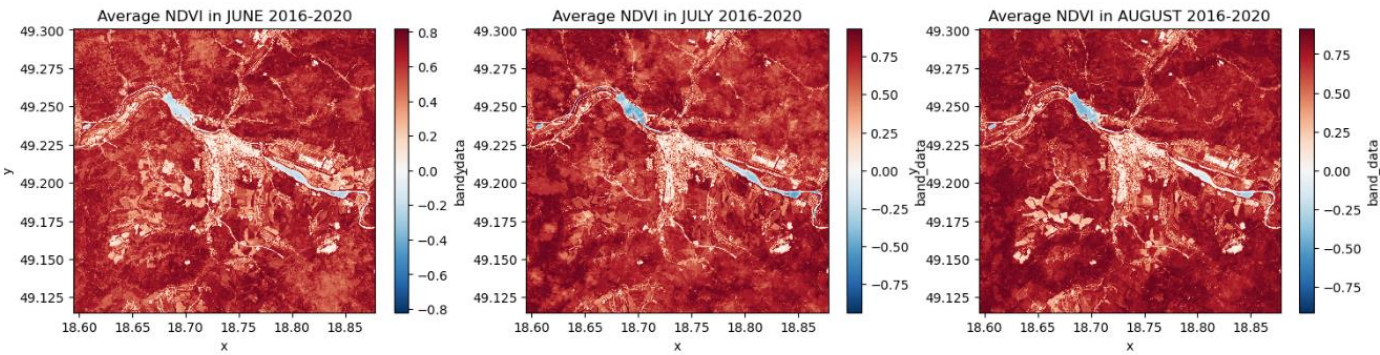
- Peseta IV – aspoň tri posebe idúce dni s maximálnou dennou teplotou vyššou akou 90 percentil



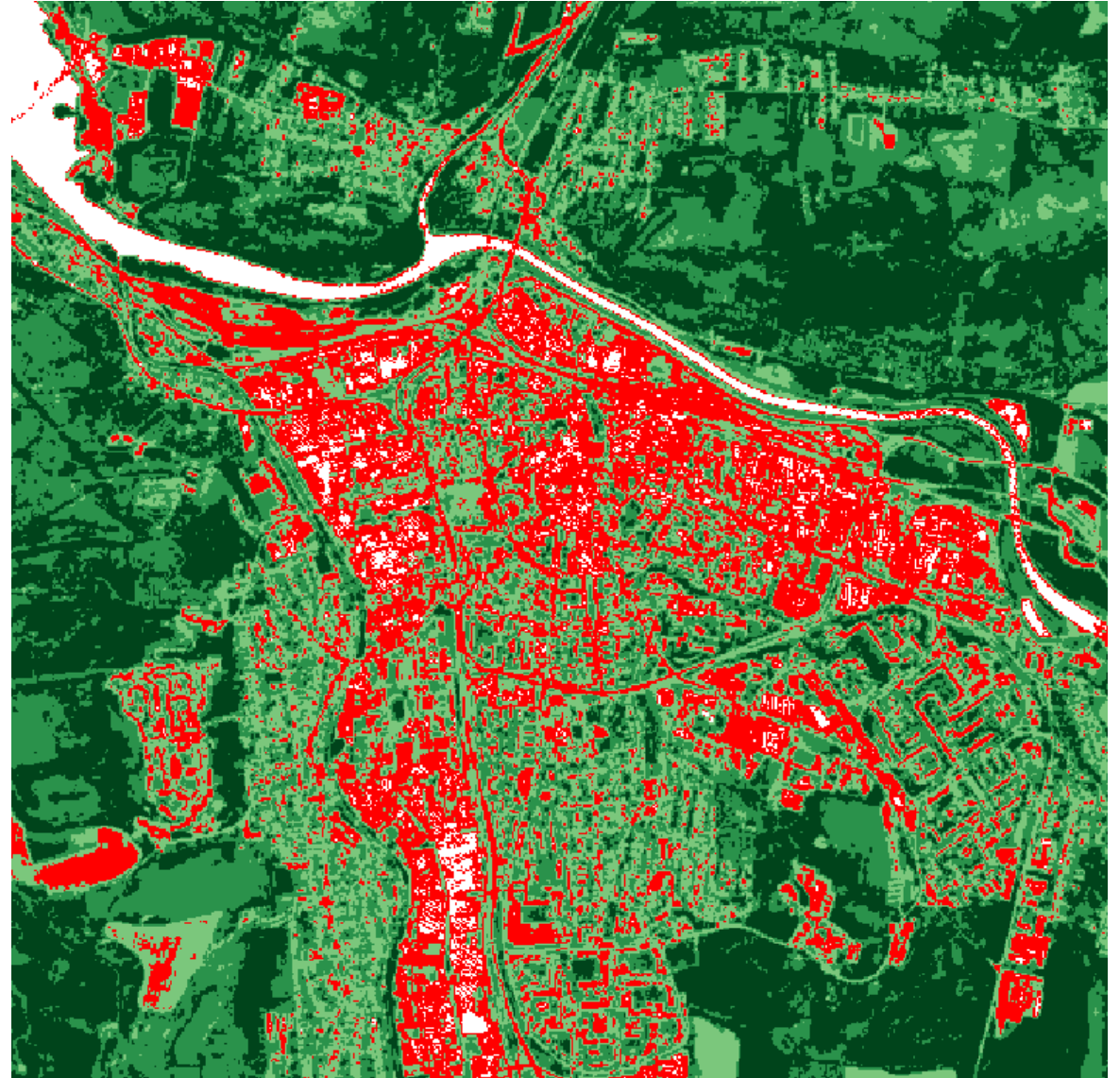
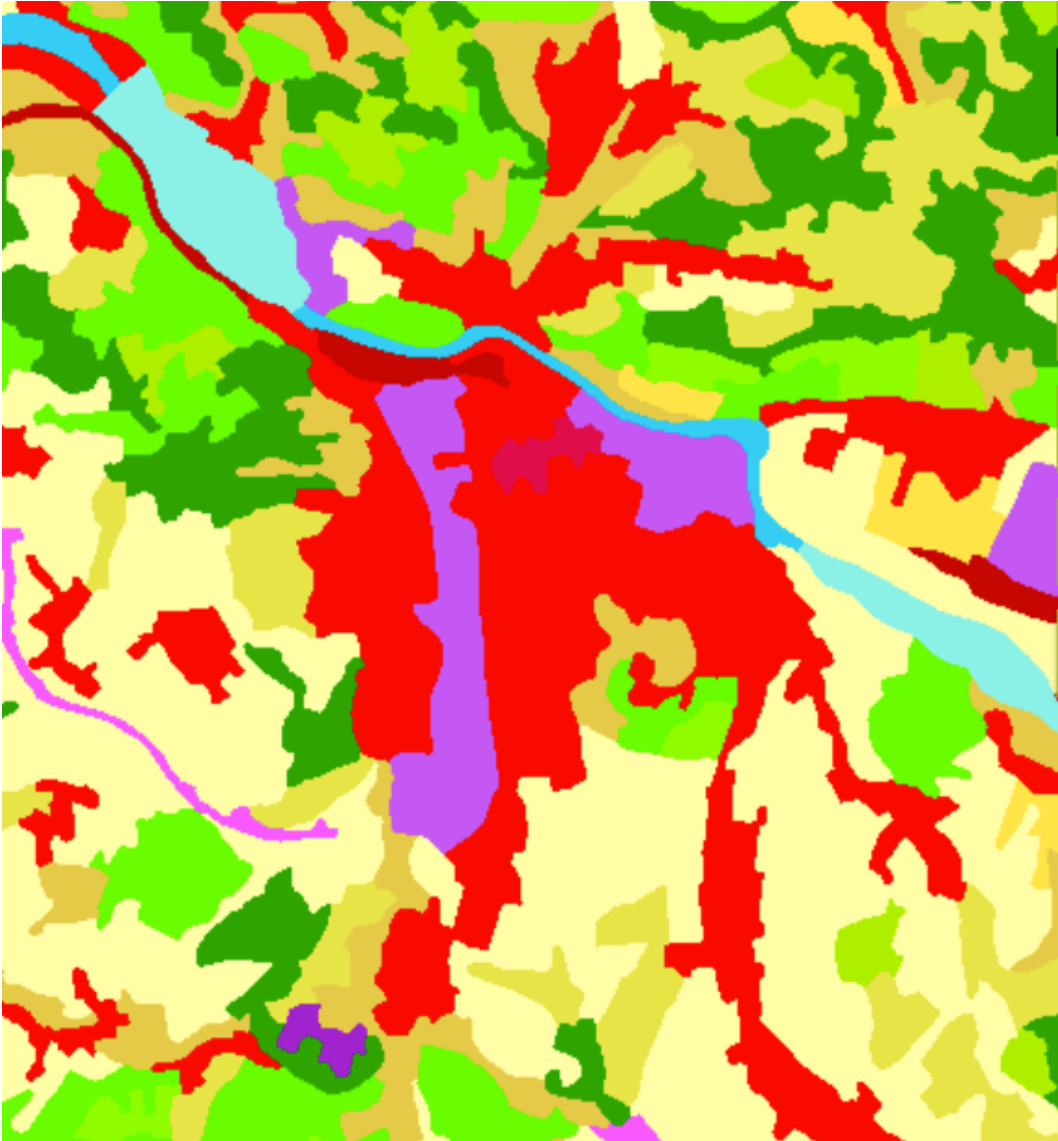
Opatrenia:



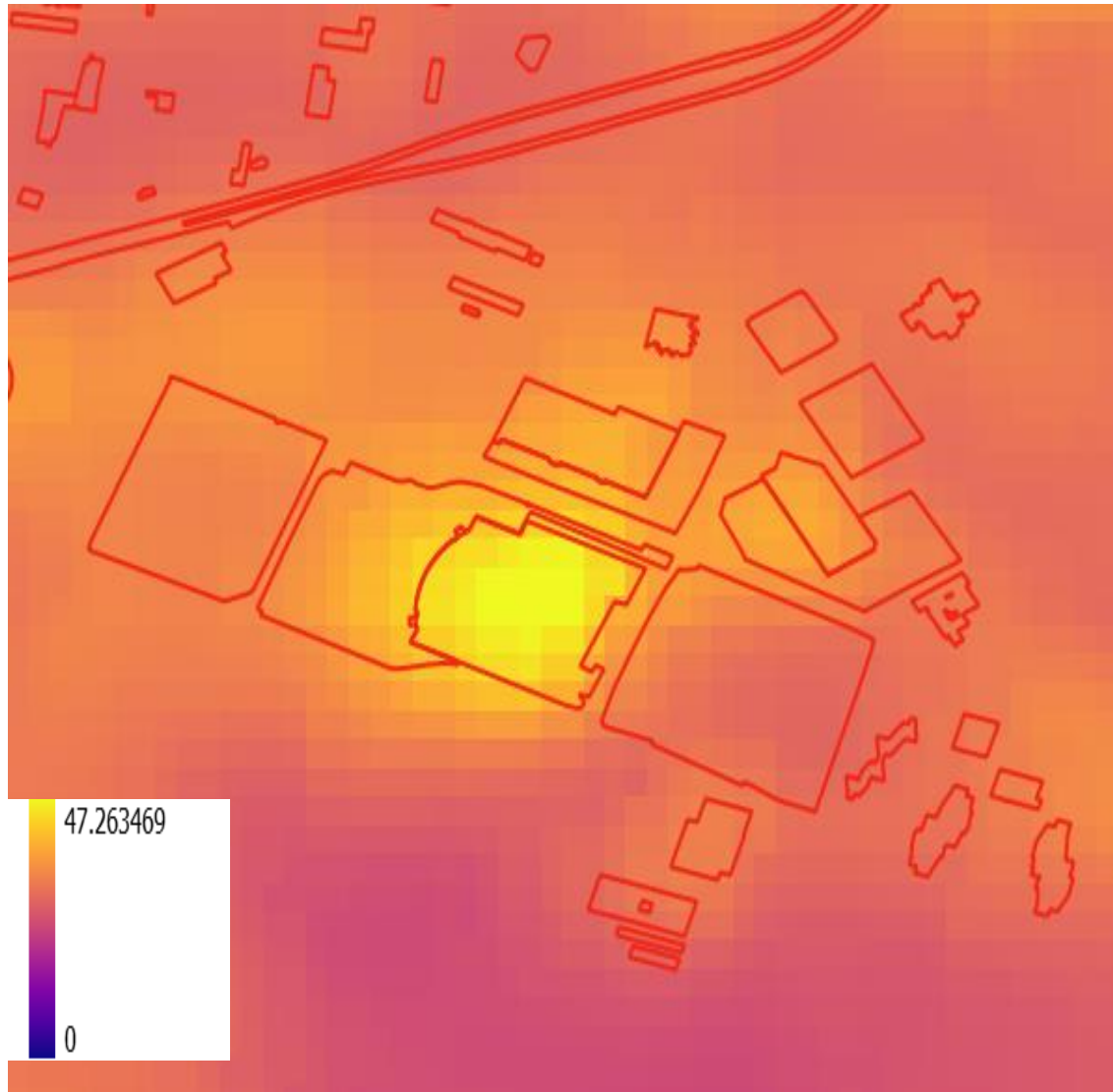
Opatrenia:



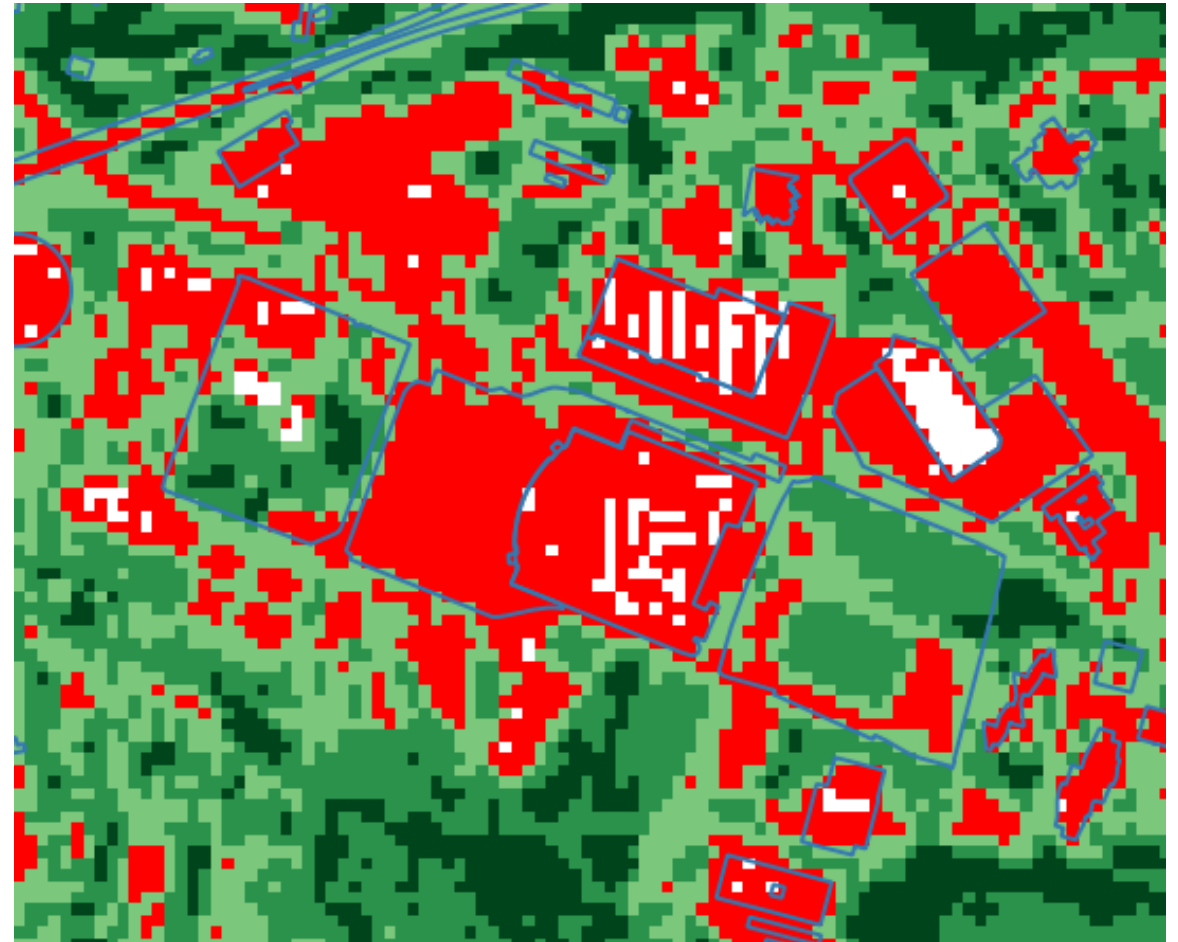
Opatrenia:



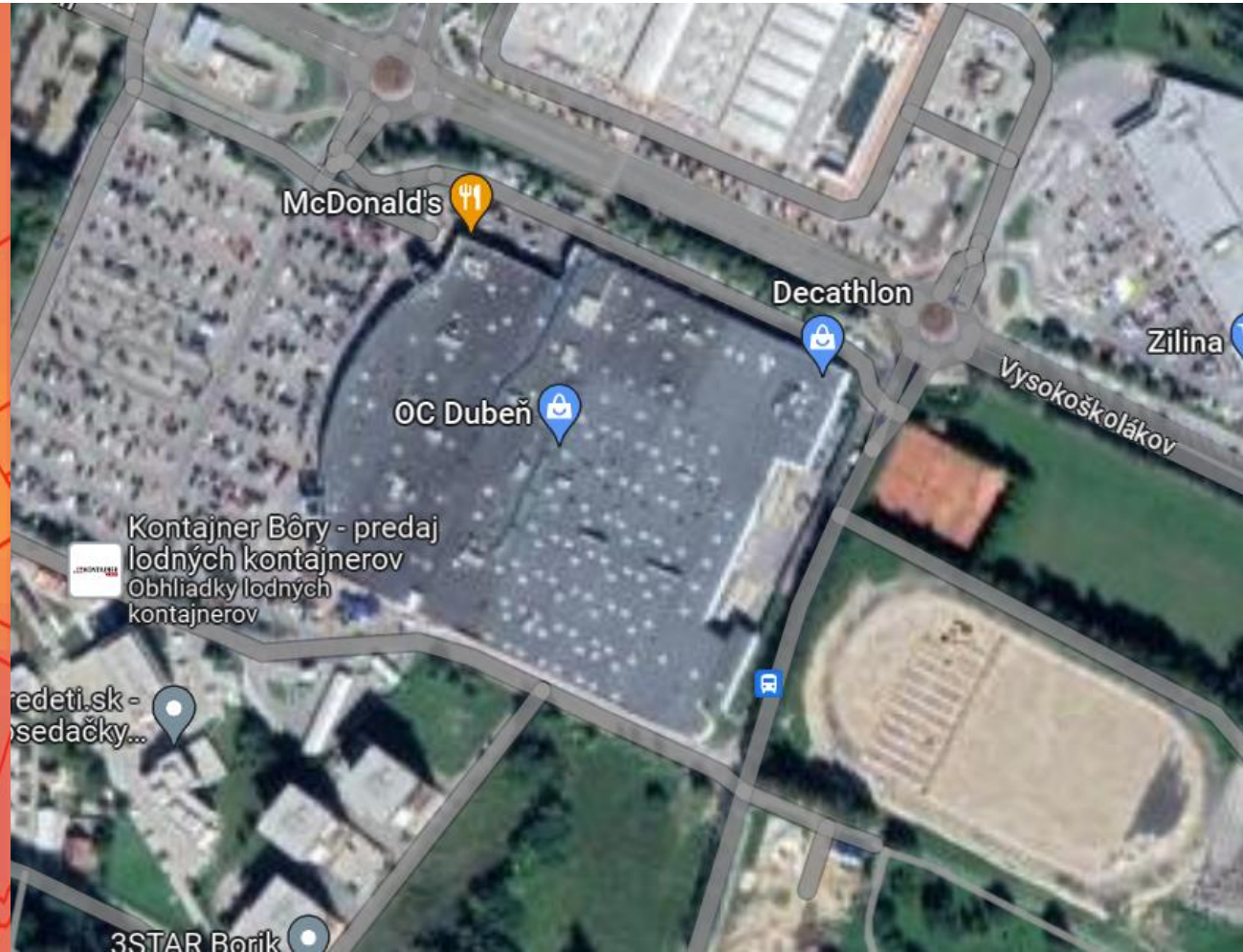
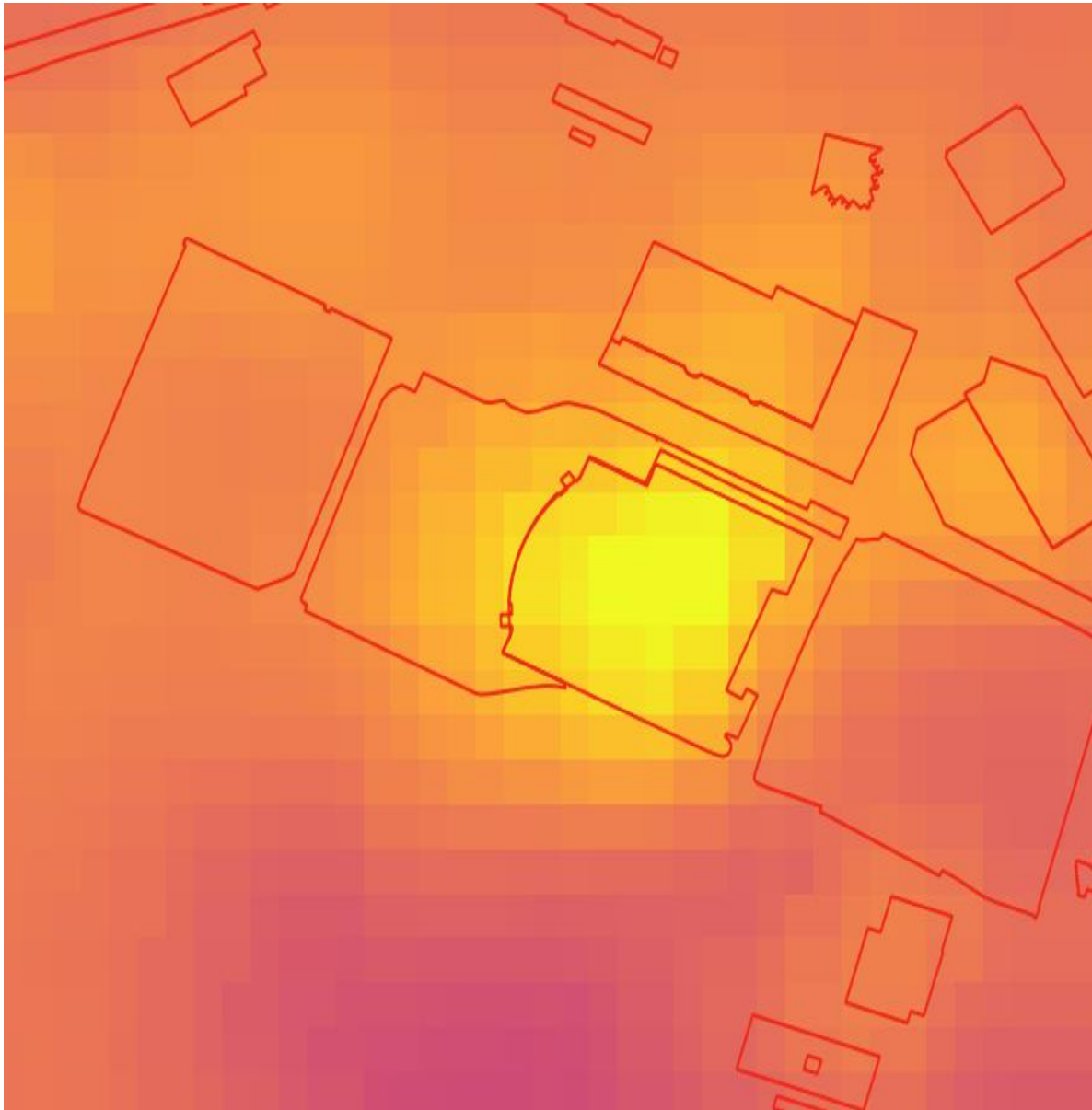
Opatrenia:



- No Data (Water, steel)
- Buildings and bare surface
- Grass
- Shrubs
- Dense Vegetation



Opatrenia:



Ukážka toolboxu (prvotná verzia):



Welcome CLIMAAX Climate Risk Assessment Handbook

Introduction to CLIMAAX

Our mission

Aim and functionality of the toolbox

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Glossary

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Example files

Markdown notebooks example

Markdown example

Notebook example



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In a nutshell

Welcome CLIMAAX Climate Risk Assessment Handbook

CLIMAAX risk and vulnerability Assessment framework and toolbox (CLIMAAX) is a 4-year Horizon Europe project that will provide financial, analytical, and practical support to improve regional climate and emergency risk management plans. CLIMAAX is designed to contribute to the harmonization and consolidation of the practice of climate risk assessment, leaving a legacy for upcoming European initiatives. The project started in January 2023 and runs until December 2026.

In a nutshell

The European landscape of disaster risk management and climate adaptation is far from uniform.

CLIMAAX builds upon existing risk assessment frameworks, methods and tools, and promotes the use of datasets and service platforms for local and regional scale deployment. It will develop a robust and coordinated framework of consistent, harmonised and comparable risk assessments.

The project brings the existing tools and services beyond state-of-the-art by prioritizing the further development of accessibility, guidance, tuning to local contexts, interpretation and uptake by representative Disaster Risk Management and Civil Protection authorities.

CLIMAAX is designed to significantly contribute to the harmonization and consolidation of the practice of climate risk assessment (CRA), leaving a substantial legacy for upcoming European initiatives. The project will deliver:

1. A standardized CRA framework CRA built on current community experience and best-practices
2. A Toolbox with data, models and utilities to provide access to European and global open data archives integrated with local data and procedures
3. Five European pilot regional CRAs to shape the framework and toolset
4. Financial support for at least 50 regions to execute a context specific CRA
5. CRA guidance material and online helpdesk for other European regions
6. A proposal to upscale results into the future operationalization of the regional CRA support function

Next
Our mission >

Ukážka toolboxu (prvotná verzia):

crabook Public

Repository for Climate Risk Assessment Book

● TeX 0 0 0 0 0 Updated 2 hours ago

STORMS Public

Repository for collaboration on workflows for storms hazard

● Jupyter Notebook 1 Apache-2.0 0 0 0 0 Updated 3 hours ago

FLOODS Public

Repository for collaboration on workflows for floods hazard

● Jupyter Notebook 1 Apache-2.0 0 0 0 0 Updated 3 days ago

DROUGHTS Public

Repository for collaboration on workflows for droughts hazard

● Jupyter Notebook 1 Apache-2.0 0 0 0 0 Updated last week

FIRE Public

Repository for collaboration on workflows for Fire hazard

● Jupyter Notebook 1 Apache-2.0 0 0 0 0 Updated on Jul 25

HEATWAVES Public

Repository for collaboration on workflows for heatwaves hazard

● Jupyter Notebook 1 Apache-2.0 0 0 0 0 Updated on Jul 25

SNOW Public

Repository for collaboration on workflows for Snow hazard

● Jupyter Notebook 1 Apache-2.0 0 0 0 0 Updated on Jul 25

Ukážka toolboxu (prvotná verzia):

The screenshot displays the CLIMAAX Climate Risk Assessment Handbook website. The left sidebar contains a navigation menu with the following items: Welcome CLIMAAX Climate Risk Assessment Handbook, Introduction to CLIMAAX (Our mission, Aim and functionality of the toolbox), Risk assessments (About workflows, CLIMAAX workflows, FLOODS workflow, DROUGHTS workflow - simple, DROUGHTS workflow - advanced, Heatwave workflow, FIRE workflow, SNOW workflow, WIND workflow), Explore data, Resources (Useful materials, Glossary, FAQ), and a blue-bordered box at the bottom labeled "Initial CRA book structure". The main content area features a header with a hamburger menu and icons for refresh, download, full screen, settings, and search. The first section is "Simple droughts workflow", which includes a link to "launch binder" and a paragraph stating it is the second and simpler drought workflow. The second section is "Risk assessment methodology", which explains the approach of visualizing exposed vulnerable populations to drought by overlaying hazard data (Combined Drought Indicator (CDI)) and population data. A blue-bordered box on the right, labeled "Workflow notebook structure", contains a "Contents" table of contents: Risk assessment methodology, Preparation work, Download data, Explore the data, Process the data, Plot it together, Conclusions, Contributors, and Appendix I - Customised plot explained step by step. Below the methodology text, a blue-bordered box labeled "Hazard data" contains a paragraph about the Combined Drought Indicator (CDI) and a bulleted list of three primary drought classes: Standardized Precipitation Index (SPI), the Soil Moisture Anomaly (SMA), and the FAPAR Anomaly. A final blue-bordered box at the bottom of the main content area is labeled "Two additional classes - namely".

CLIMAAX
climate ready regions

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DROUGHTS workflow - simple

DROUGHTS workflow - advanced

Heatwave workflow

FIRE workflow

SNOW workflow

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Simple droughts workflow

Click [launch binder](#) to launch this workflow on MyBinder.

This is the second and simpler drought workflow.

Risk assessment methodology

The approach is to visualise the exposed vulnerable population to the drought. This can be done by overlying the hazard data of drought, expressed as Combined Drought Indicator (CDI), and population data.

Hazard data

The Combined Drought Indicator (CDI) that is implemented in the European Drought Observatory (EDO) is used to identify areas affected by agricultural drought, and areas with the potential to be affected. CDI can be downloaded from the [Copernicus data server](#) and is derived by combining three drought indicators produced operationally in the EDO framework - namely the

- **Standardized Precipitation Index (SPI),**
- **the Soil Moisture Anomaly (SMA), and**
- **the FAPAR Anomaly** - in such a way that areas are classified according to three primary drought classes:
 1. "Watch" - indicating that precipitation is less than normal;
 2. "Warning" - indicating that soil moisture is in deficit; and
 3. "Alert" - indicating that vegetation shows signs of stress.

Two additional classes - namely

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Risk assessment methodology

Preparation work

Download data

Explore the data

Process the data

Plot it together

Conclusions

Contributors

Appendix I - Customised plot explained step by step

Workflow notebook structure

Initial CRA book structure

Ukážka toolboxu (prvotná verzia):

Chelsea, July 2016 max mean daily air temperature

```
6]: 1 # Load of the Chelsa data
      2 #https://envicloud.wsl.ch/#/?prefix=chelsa%2Fchelsa_V2%2FGLOBAL%2F
      3 ch='C:/Work/KAJO/CLIMAX/GitHub/Downscale/CHELSA_tasmax_07_2016_V.2.1.tif'
      4 #EC= xr.open_dataset(ec, decode_coords="all")
      5 CH= xr.open_dataset(ch)
      6 CH=CH['band_data']
      7 #CH.plot()
      8 CH=CH[0]
      9 # (18.59485688668886, 49.1151186646496, 18.87809569577174, 49.30106992846235)
     10 CHZA = CH.rio.clip_box(minx=18.59485688668886, miny=49.1151186646496, maxx=18.87809569577174, maxy=49.30106992846235)
     11 CHZA=(CHZA/10) - 273.15
     12 #CHZA.plot()

7]: 1 # Chelsa data reproject to Landsat
      2 CHZA84=CHZA.rio.reproject_match(LS)

8]: 1 # Plot Cordex, Chelsa, Landsat
      2 fig, axes=plt.subplots(ncols=3, figsize=(18,4))
      3 ECmax84.plot(ax=axes[0])
      4 axes[0].set_title('Cordex july 2016 max daily air T 11km')
      5 CHZA84.plot(ax=axes[1])
      6 axes[1].set_title('Chelsa july 2016 max daily air T 1km')
      7 LS.plot(ax=axes[2])
      8 axes[2].set_title('Landsat8 july 2016 land surafce T 30m')
      9 plt.draw()
```

