Centre of Environmental Research

Waste Management, Circular Economy and Environmental Security

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VÚV TGM

WP 2.C MONITORING OF CONTAMINATED SITES

Environment - Environment for Life
12. – 14. 9. 2022

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MONITORING OF CONTAMINATED SITES

Ing. Jana Seidlová

Czech Environmental Information Agency

Monitoring of Contaminated Sites

New methods for decontamination of water and rock environments with special focus on new types of contaminants (pesticides and similar types of pollutants)

- Extend and systematise the detection and monitoring of contaminated sites
- Deepen practical knowledge of contaminated sites
- Remote sensing

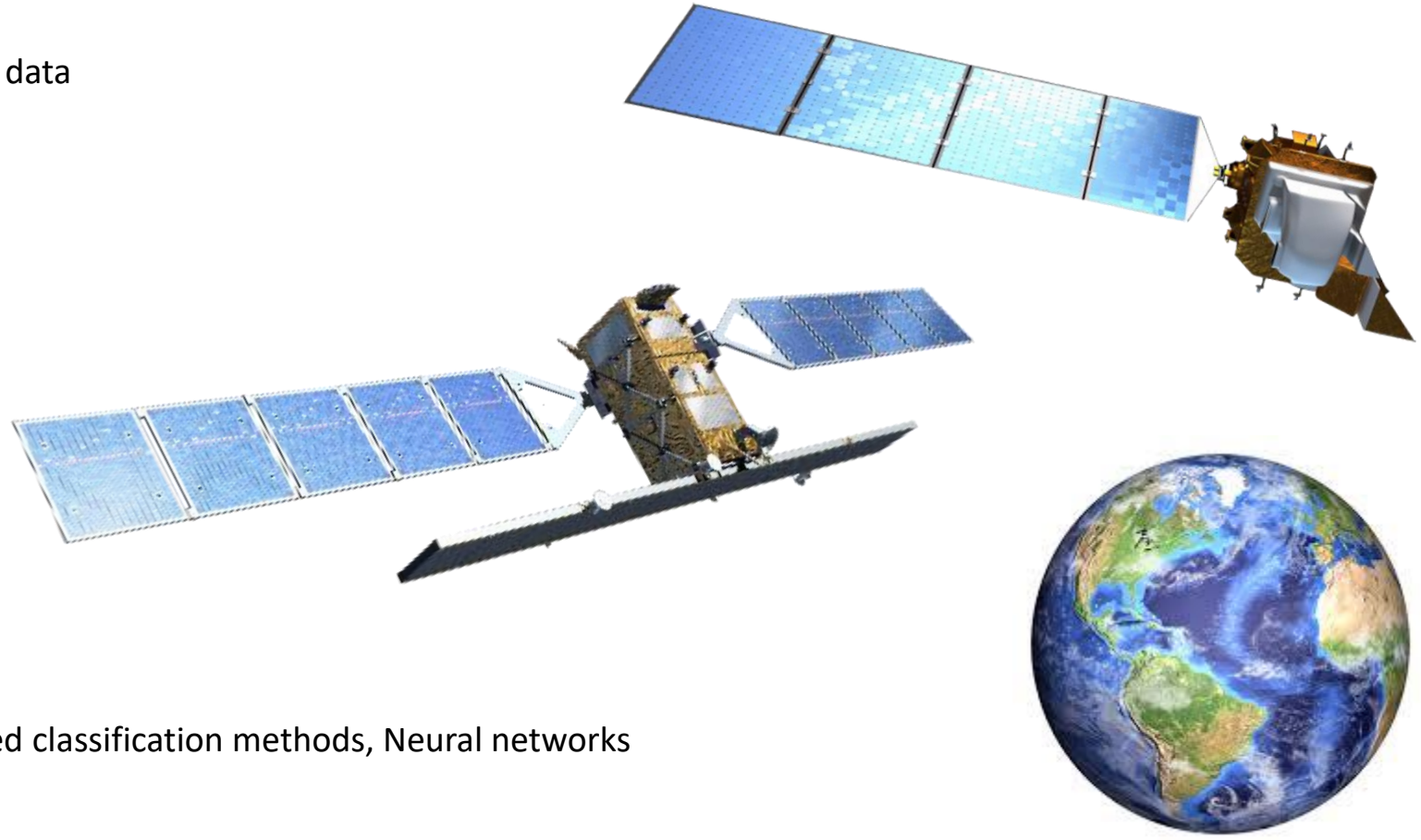
2.C.1 Review of the Use of Remote Sensing Methods and Mining of Existing CS Databases

01/2021–12/2021

Date:

Freely available data, very high resolution data

- Radar data
- Multispectral data
- Hyperspectral data



Data preprocessing:

- Radiometric calibration
- Atmospheric correction
- Geometric correction
- Illumination correction

Classification algorithms:

- LDA, SAM, SID, LSU, MESMA, Supervised classification methods, Neural networks

2.C.2 Analysis of Multispectral, Hyperspectral and Radar Remote Sensing Data

01/2022–12/2024

Explore how airborne lidar, satellite radar and multispectral data can be sensitive for estimating landfill shape changes

Airborne laser scanning data:

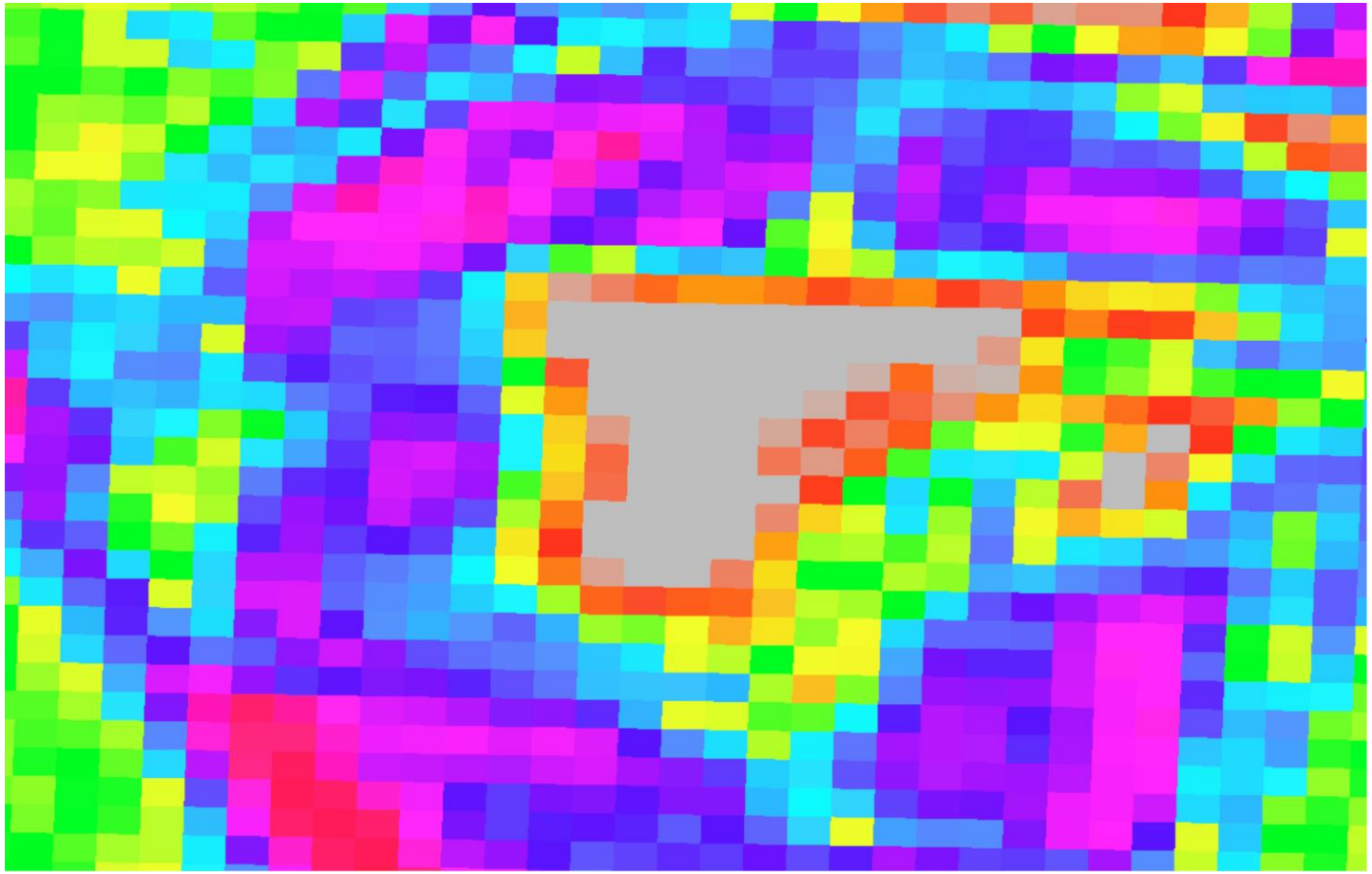
- Klobouky u Brna landfill
- Lidar - 4 June 2021 and 3 December 2021
- Radar - 5 June 2021 and 2 December 2021
- Multispectral - 4 June 2021 and 3 December 2021

Outputs from Radar Data

- Interferometry
- DEM
- Local Incidence Angle
- Intensity VH and Intensity VV

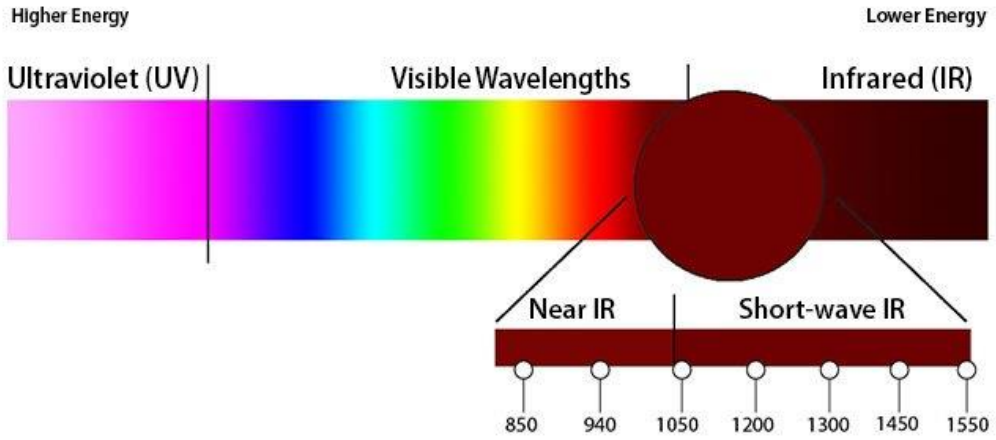
Outputs of Multispectral Data

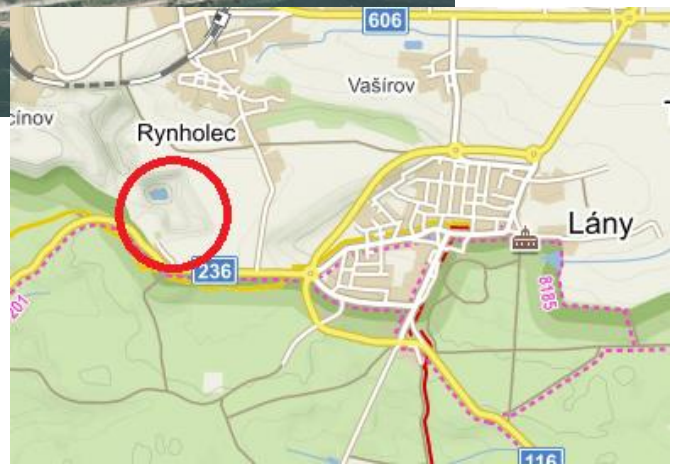
- Spectral indices
- DEM
- Supervised classification



Lány Landfill - Ordered Imaging and Ground Measurements

- September - best conditions
- HS VNIR 1 m
- HS SWIR 2,5 m
- Lidar 5 points/m^2
- Landfill gas monitoring



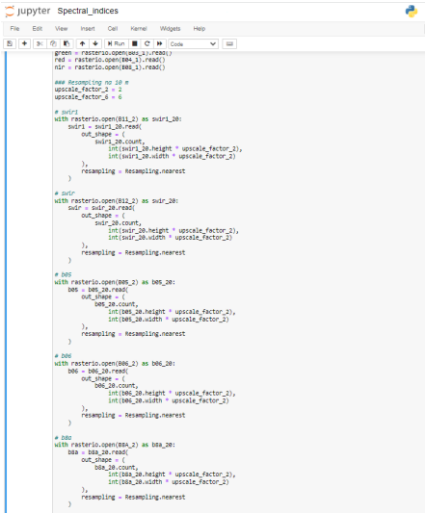


2.C.3 Development and Testing of the CS Passporting Methodology

01/2022–12/2022

- Definition of JSON data structure for DB storage
- PostgreSQL JSONB data type
- Suitable for quick reflectance curve retrieval (visualisation and comparative analysis)

2.C.4 Creation of a Software Tool for CS Monitoring



01/2021–12/2024

- Literature review
- Statistical and ML methods (correlation coefficients, Partial Curve Mapping, FFT, etc.)
- Local modeling and definition of statistical and ML tools for spectral curve description
- Testing and selection of the most suitable methods for spectral curves comparison
- Review and testing of available software libraries (JS, Python, Java)

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Thank you for your attention

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