

# Processing and Visualizing Large Geospatial Data Using R, Python and Julia

OpenGeoHub Summer School 2023- Poznan

The OpenGeoHub Summer School was held for a week, from August 27<sup>th</sup> to September 1<sup>st</sup>, in Poznan, Poland. During this week, a lot of lectures about open data, open processes, and open-source software were presented. The Summer School title was “Processing and visualizing large geospatial data using R, Python and Julia”, which reflected the predominance of lectures and contents based on these programming languages. Besides that, a lot of discussions about the importance of the scientific findings and workflows being made with openness concept, and being easily reproducible, especially by other research that don't have a lot of resources available.

The summer school had plenty of valuable content that will be, for sure, used during my future projects, both personally and professionally. Things like notebooks, books, tips were some of these contents that were shared and discussed during the week.

Since there was a lot of content to follow, I had to choose the ones I'd like to watch. Below I list the lectures I participated in:

- Introduction to working with spatial data in Python (Michael Dorman)
- Processing geospatial data using JuliaGeo framework (Maarten Pronk)
- Unsupervised classification (clustering) of satellite images (Krzysztof Dyba)
- Cloud-based analysis of Earth Observation data using openEO platform, R and Python (Edzer Pebesma)
- Xcube for spatiotemporal data analysis and visualization (Alicja Balfanz)
- Mapping explanation – Python toolchain for spatial interpretative machine learning (Jarek Jesiewicz)
- Tools and packages to query and process Sentinel-1 and Sentinel-2 data with R and Python (Lorena Abad)

Discussions:

- What can R, Python and Julia development communities do to combat the climate crisis?
- Sharing your geospatial knowledge in the open (Jakub Nowosad)

The certificate of participation and the whole schedule for the OpenGeoHub Summer School are attached below to this document.

# OpenGeoHub Summer School 2023



## Agenda

Sunday  
August 27th, 2023

Bogumiła Krygowskiego 10, 61-680  
Poznań, Poland

**18:00 - 21:00**

**Icebreaker**

**Location will be sent via  
Mattermost**

Monday  
August 28th, 2023

**9:00 - 10:30**

**Plenary introduction, including introduction to the hackathons**  
Tom Hengl - Director OpenGeoHub Foundation

**Room 21**

**10:30 - 11:00**

**Coffee break**

**11:00 - 12:30**

**Tidy geographic data with sf, dplyr, ggplot2, geos and friends (part 1)**  
Robin Lovelace

**Room 21**

**11:00 - 12:30**

**Introduction to working with spatial data in Python (part 1)**  
Michael Dorman

**Room 18**

**12:30 - 13:30**

**Lunch break**

<https://pretalx.earthmonitor.org/opengeohub-summer-school-2023/schedule/>

# OpenGeoHub Summer School 2023



## Agenda

Bogumiła Krygowskiego 10, 61-680  
Poznań, Poland

13:30 - 15:00	<b>Tidy geographic data with sf, dplyr, ggplot2, geos and friends (part 2)</b> Robin Lovelace	Room 21
13:30 - 15:00	<b>Introduction to working with spatial data in Python (part 2)</b> Michael Dorman	Room 18
15:00 - 15:30	<b>Coffee break</b>	
15:30 - 16:15	<b>Hackathon workshop</b> Krzysztof Dyba, Niels Ratnaweera	Room 21
16:15 - 17:45	<b>Research speed dating</b>	Room 21

Tuesday  
August 29th, 2023

9:00 - 10:30	<b>Raster and vector data cubes in R (part 1)</b> Edzer Pebesma	Room 21
--------------	--	---------

<https://pretalx.earthmonitor.org/opengeohub-summer-school-2023/schedule/>

# OpenGeoHub Summer School 2023



## Agenda

Bogumiła Krygowskiego 10, 61-680  
Poznań, Poland

9:00 - 10:30	<b>Processing geospatial data using JuliaGeo framework (Julia tutorial) (part 1)</b> Maarten Pronk	Room 18
10:30 - 11:00	<b>Coffee break</b>	
11:00 - 12:30	<b>Raster and vector data cubes in R (part 2)</b> Edzer Pebesma	Room 21
11:00 - 12:30	<b>Processing geospatial data using JuliaGeo framework (Julia tutorial) (part 2)</b> Maarten Pronk	Room 18
12:30 - 13:30	<b>Lunch break</b>	
13:30 - 15:00	<b>Unsupervised classification (clustering) of satellite images (part 1)</b> Krzysztof Dyba	Room 21
13:30 - 15:00	<b>Progress in modernizing and replacing infrastructure packages in R-spatial workflows (part 1)</b> Roger Bivand	Room 18

# OpenGeoHub Summer School 2023



## Agenda

Bogumiła Krygowskiego 10, 61-680  
Poznań, Poland

15:00 - 15:30	Coffee break	
15:30 - 17:00	Unsupervised classification (clustering) of satellite images (part 2) Krzysztof Dyba	Room 21
15:30 - 17:00	Progress in modernizing and replacing infrastructure packages in R-spatial workflows (part 2) Roger Bivand	Room 18
17:00 - 18:30	Hackathon (consultations)	Room 21
17:15 - 19:45	Outdoor excursion: Meteorite site	Morasko Preserve

Wednesday  
August 30th, 2023

9:00 - 10:30	Cloud-based analysis of Earth Observation data using openEO Platform, R and Python (part 1) Edzer Pebesma	Room 21
--------------	--	---------

<https://pretalx.earthmonitor.org/opengeohub-summer-school-2023/schedule/>

# OpenGeoHub Summer School 2023



## Agenda

Bogumiła Krygowskiego 10, 61-680  
Poznań, Poland

9:00 - 10:30	<b>Parallelization of geoprocessing workflows in GRASS GIS and Python (part 1)</b> Caitlin Haedrich	<b>Room 18</b>
10:30 - 11:00	<b>Coffee break</b>	
11:00 - 12:30	<b>Cloud-based analysis of Earth Observation data using openEO Platform, R and Python (part 2)</b> Edzer Pebesma	<b>Room 21</b>
11:00 - 12:30	<b>Parallelization of geoprocessing workflows in GRASS GIS and Python (part 2)</b> Caitlin Haedrich	<b>Room 18</b>
12:30 - 13:30	<b>Lunch break</b>	
13:30 - 15:00	<b>Environmental analysis using satellite image time series (part 1)</b> Ewa Grabska-Szwagrzyk	<b>Room 21</b>
13:30 - 15:00	<b>Xcube for spatiotemporal data analysis and visualization (part 1)</b> Alicja Balfanz	<b>Room 18</b>

<https://pretalx.earthmonitor.org/opengeohub-summer-school-2023/schedule/>

# OpenGeoHub Summer School 2023



## Agenda

Bogumiła Krygowskiego 10, 61-680  
Poznań, Poland

15:00 - 15:30	Coffee break	
15:30 - 17:00	<b>Environmental analysis using satellite image time series (part 2)</b> Ewa Grabska-Szwagrzyk	Room 21
15:30 - 17:00	<b>Xcube for spatiotemporal data analysis and visualization (part 2)</b> Alicja Balfanz	Room 18
17:00 - 18:30	<b>Discussion panel: What can R, Python, and Julia development communities do to combat the climate crisis?</b> Anita Graser, Lorena Abad, Tom Hengl, Edzer Pebesma, Maarten Pronk	Room 21

Thursday  
August 31st, 2023

9:00 - 10:30	<b>Spatial ML model assessment and interpretation (part 1)</b> Alexander Brenning	Room 21
9:00 - 10:30	<b>Mapping explanation - Python toolchaing for spatial interpretative machine learning (part 1)</b> Jarek Jasiewicz	Room 18

<https://pretalx.earthmonitor.org/opengeohub-summer-school-2023/schedule/>

# OpenGeoHub Summer School 2023



## Agenda

Bogumiła Krygowskiego 10, 61-680  
Poznań, Poland

10:30 - 11:00	Coffee break	
11:00 - 12:30	Spatial ML model assessment and interpretation (part 2) Alexander Brenning	Room 21
11:00 - 12:30	Mapping explanation - Python toolchaing for spatial interpretative machine learning (part 2) Jarek Jasiewicz	Room 18
12:30 - 13:30	Lunch break	
13:30 - 15:00	Tools and packages to query and process Sentinel-1 and Sentinel-2 data with R and Python (part 1) Lorena Abad	Room 21
13:30 - 15:00	Data engineering for Mobility Data Science (with Python and DVC) Anita Graser	Room 18
16:00 - 18:00 18:00 - 22:00	Social activity: City Tour game + Happy Hour	Location will be shared by organizers

<https://pretalx.earthmonitor.org/opengeohub-summer-school-2023/schedule/>



# OpenGeoHub Summer School 2023



## Agenda

Friday  
September 1st, 2023

Bogumiła Krygowskiego 10, 61-680  
Poznań, Poland

9:00 - 10:30	<b>Tools and packages to query and process Sentinel-1 and Sentinel-2 data with R and Python (part 2)</b> Lorena Abad	Room 21
9:00 - 10:30	<b>Processing large OpenStreetMap datasets for geocomputational research</b> Robin Lovelace	Room 18
10:30 - 11:00	<b>Coffee break</b>	
11:00 - 12:30	<b>Sharing your geospatial knowledge in the open</b> Jakub Nowosad	Room 21
12:30 - 13:30	<b>Lunch break</b>	
13:30 - 15:00	<b>OEMC Hackathons Launch: Land Cover Mapping EU-LUCAS and Global-FAPAR</b> Leandro Parente - Julia Hackländer	Room 21
15:00 - 15:30	<b>Coffee break</b>	
15:30 - 17:00	<b>Summer School Final Session</b>	Room 21

# OpenGeoHub Summer School 2023



## Agenda

Saturday - Last day of the Summer School  
September 2nd, 2023

Bogumiła Krygowskiego 10, 61-680  
Poznań, Poland

**9:00-17:00**

**Half-day excursion in the nature**

**Vicinity of  
Poznan**

## CERTIFICATE OF ATTENDANCE



This is to confirm that

**Rodrigo Brust Santos**

e-mail: **rodrigobrusters@gmail.com**

has attended the OpenGeoHub Summer School 2023 “Processing and visualizing large geospatial data using R, Python and Julia” at Adam Mickiewicz University Poznań (Poland) from the 28th August till 1st September 2023.

Supplier/Beneficiary: Stichting OpenGeoHub, Address: AgroBusiness Park 10, 6708PW Wageningen, the Netherlands; EU VAT No.: NL858871683B01.  
OpenGeoHub educational services are exempt from VAT following the CRKBO registration.

This event was organized in collaboration with Adam Mickiewicz University (<https://amu.edu.pl/en>) and the support from the Open-Earth-Monitor project (<https://earthmonitor.org/>). Additional information about the Summer School is available at <https://opengeohub.org/summer-school/opengeohub-summer-school-poznan-2023/>

**Tomislav Hengl, Director OpenGeoHub, ([tom.hengl@opengeohub.org](mailto:tom.hengl@opengeohub.org))**  
**Summer School 2023 “Processing and visualizing large geospatial data using R, Python and Julia”**

In Poznań, 7 September 2022

