

Current status of EO/GI field in Warsaw University of Technology

Przemysław Kupidura

Department of Photogrammetry, Remote Sensing and SIS



**Faculty of Geodesy
and Cartography**

WARSAW UNIVERSITY OF TECHNOLOGY



Study fields at the Faculty

Geodesy and Cartography

3 levels:

Engineering

Master

PhD

3 specialisations on 2nd level studies
(involving EO):

Photogrammetry and Remote Sensing

GIS

Mobile Mapping and Navigation Systems

Study fields at the Faculty

Spatial Management

3 levels:

Engineering

Master

PhD

Study fields at the Faculty

Geoinformatics

1 program:

Engineering – practical studies

EO/SI courses structure

Geodesy and Cartography

Photogrammetry

Remote sensing

GIS

Remote sensing II

Digital image processing

GIS Technology

Set of advanced
courses in
photogrammetry and
remote sensing

Set of advanced
courses in GIS
(applications,
software)

Elements of
advanced EO

Spatial Management

Spatial analysis

EO in spatial management

Selection of GIS applications in
spatial management

EO/SI courses structure

Geoinformatics

GIS software

GIS

Remote Sensing

Spatial Analysis

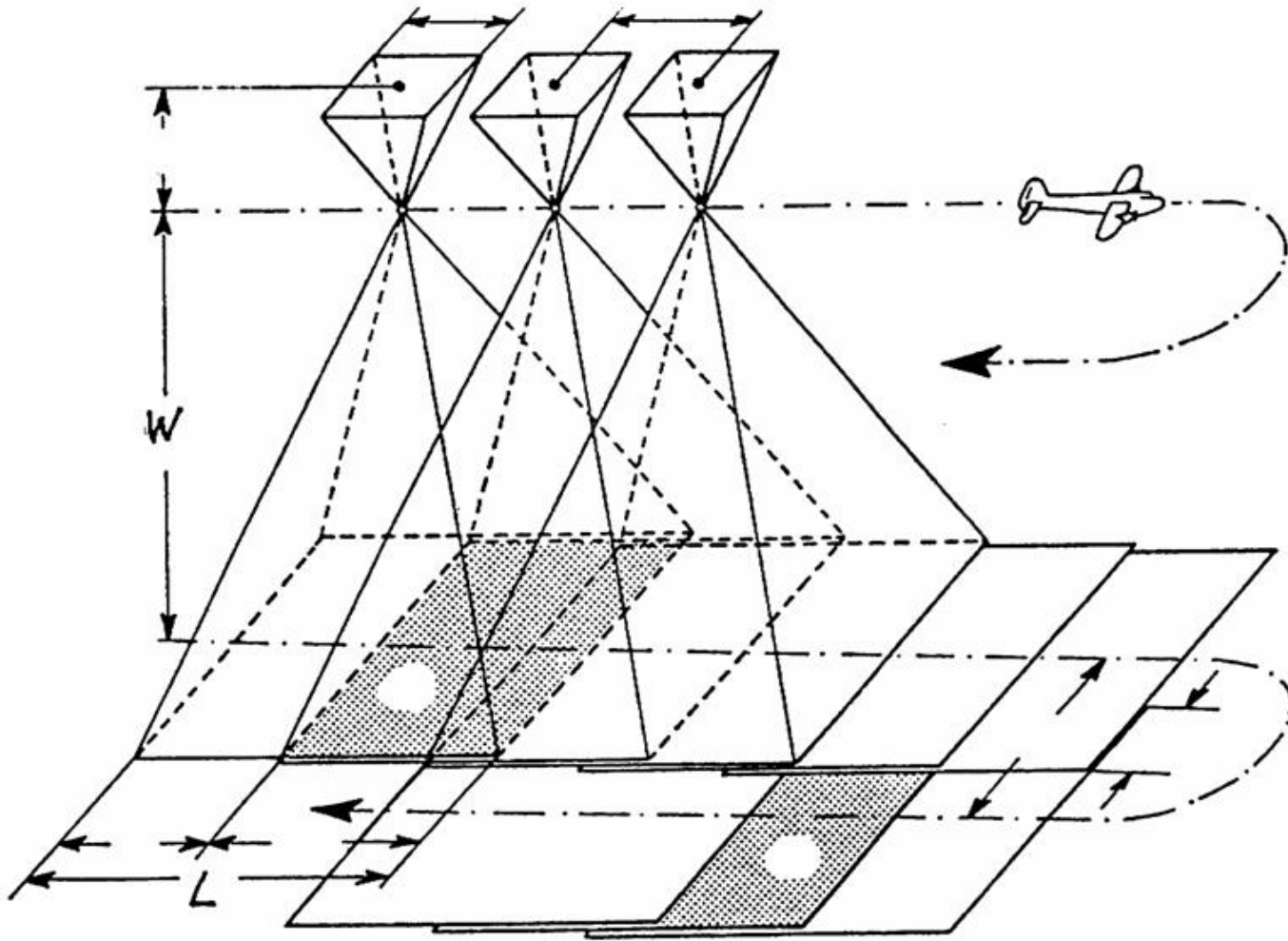
Remote Sensing II

GIS applications

Photogrammetry

geometric aspects of EO

Photogrammetry



geometry and
georeference of EO

Photogrammetry

geometry and
georeference of EO

DTM/DSM



Photogrammetry

geometry and
georeference of EO

DTM/DSM

different types of
data



Photogrammetry



geometry and
georeference of EO

DTM/DSM

different types of
data

Remote sensing

How to see

not only to watch

Remote sensing



photointerpretatio
n
reverse
engineering

physical basics

introduction to
digital imagery

Remote sensing



photointerpretatio
n
reverse
engineering

physical basics

introduction to
digital imagery

Remote sensing

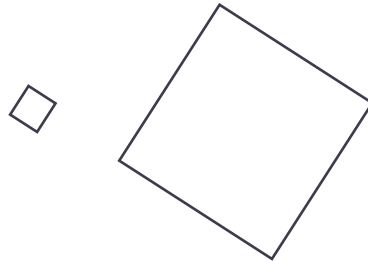
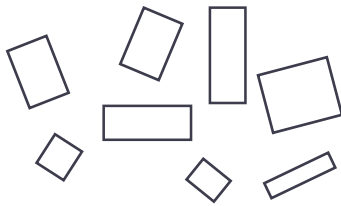
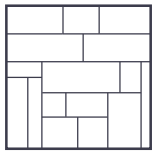
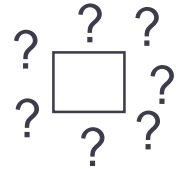
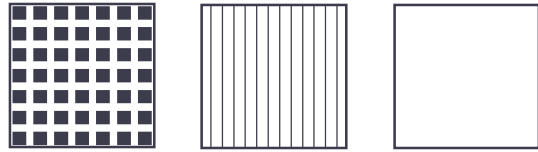


photointerpretatio
n
reverse
engineering

physical basics

introduction to
digital imagery

Remote sensing



photointerpretatio

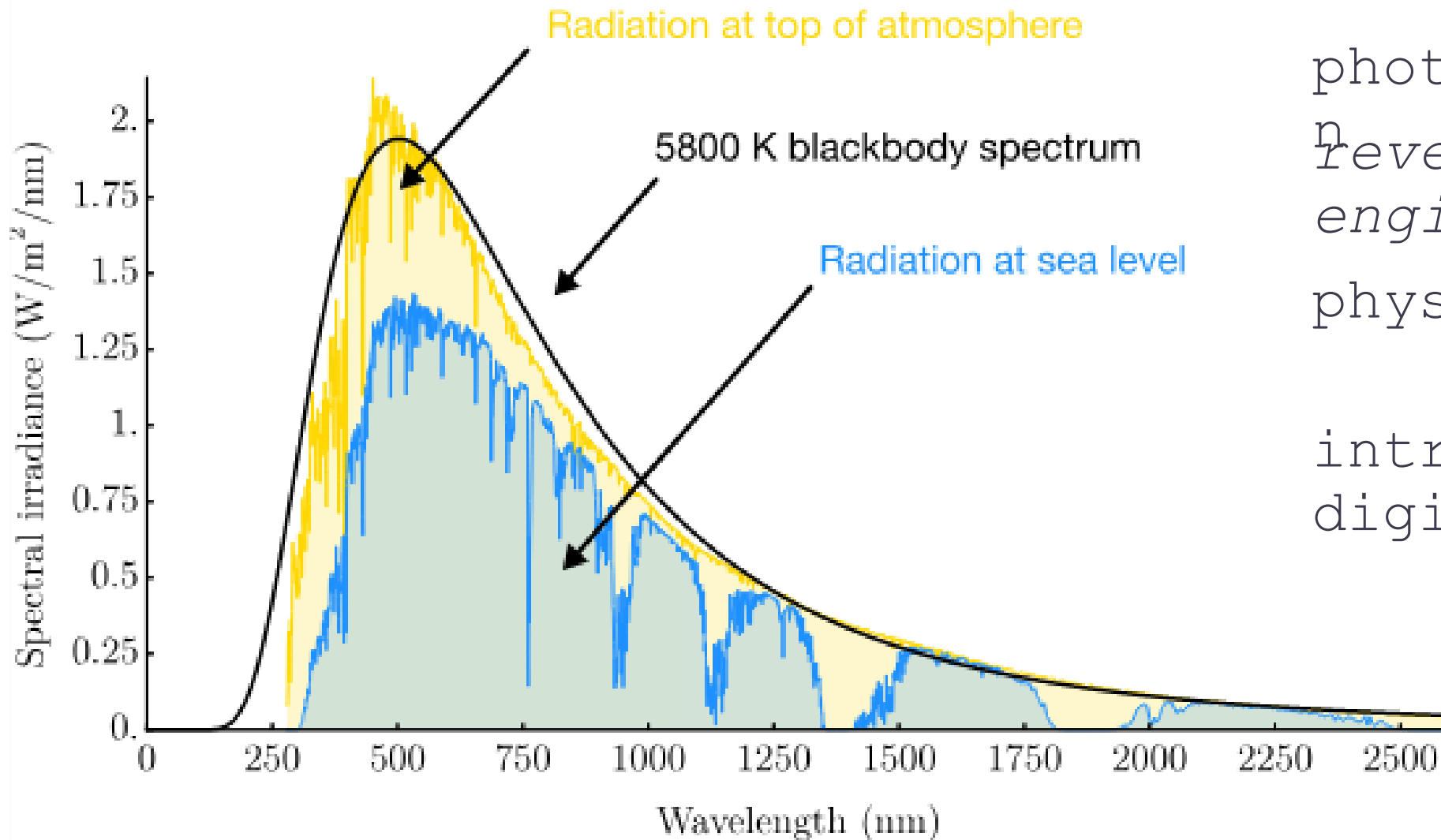
n
reverse

engineering

physical basics

introduction to
digital imagery

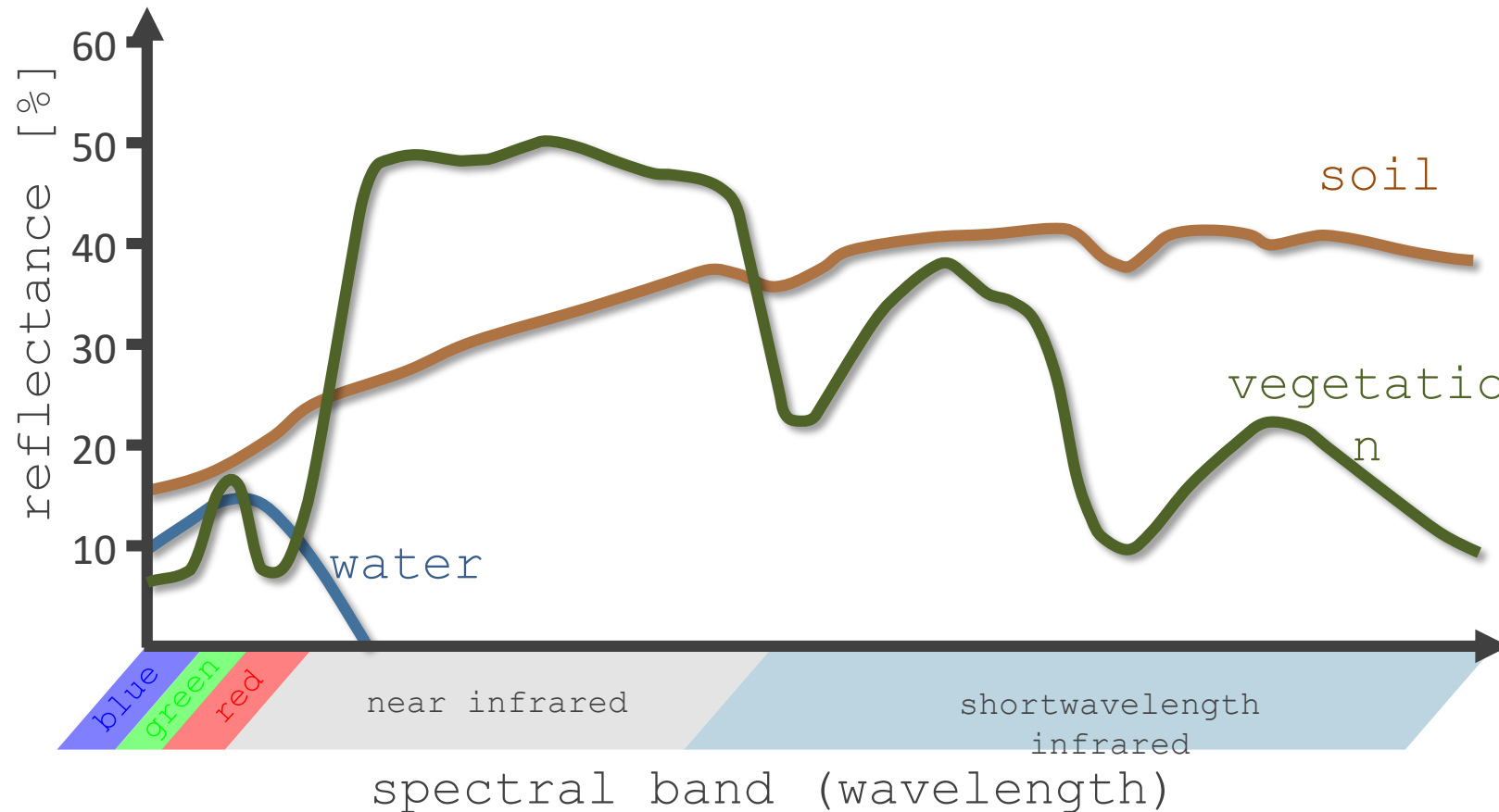
Remote sensing



photointerpretation
reverse
engineering
physical basics

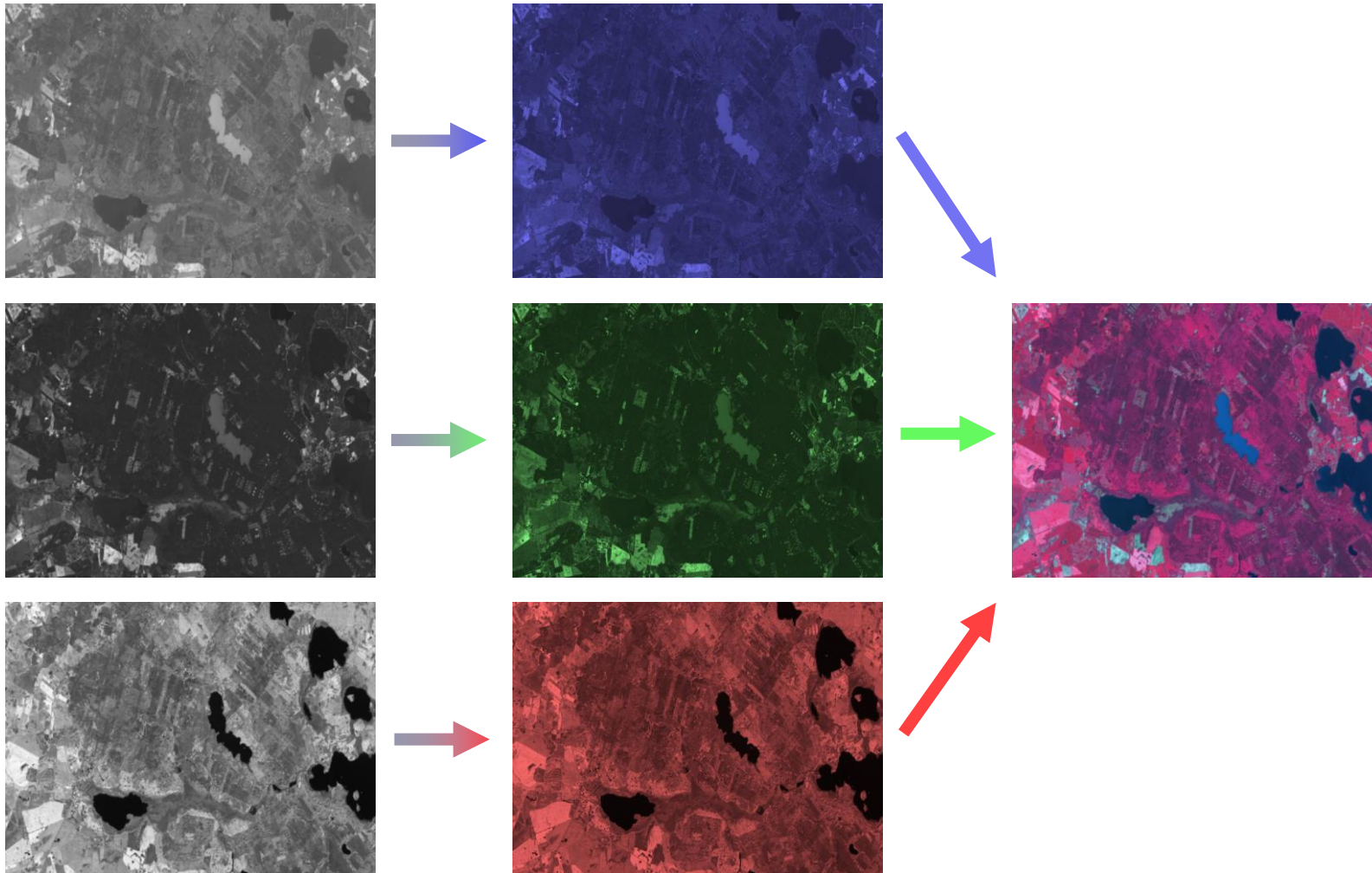
introduction to
digital imagery

Remote sensing



photointerpretation
reverse
engineering
physical basics
introduction to
digital imagery

Remote sensing



photointerpretation
reverse
engineering

physical basics

introduction to
digital imagery

Remote sensing



photointerpretatio
n
reverse
engineering

physical basics

introduction to
digital imagery

Remote sensing

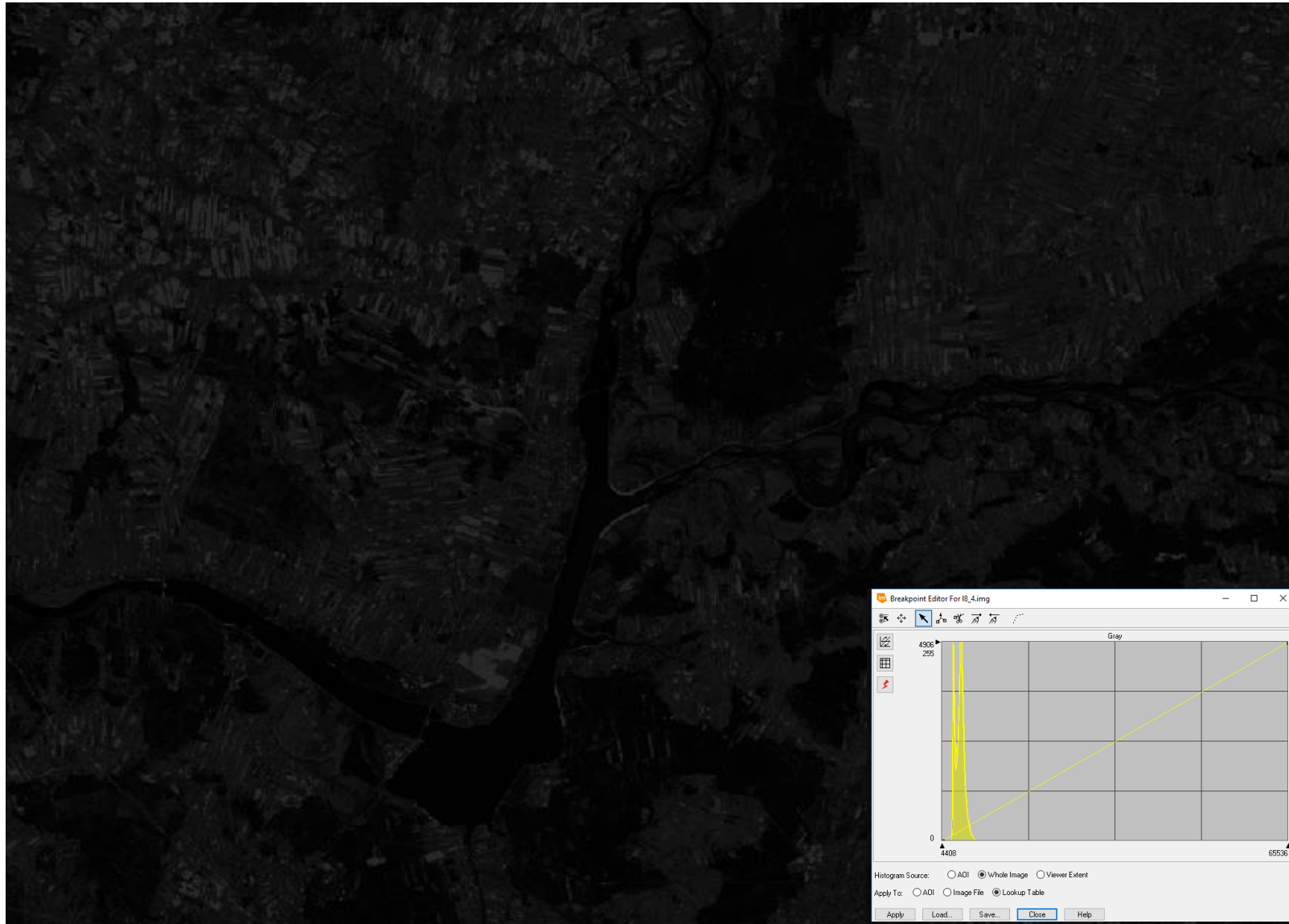


photointerpretatio
n
reverse
engineering

physical basics

introduction to
digital imagery

Remote sensing II

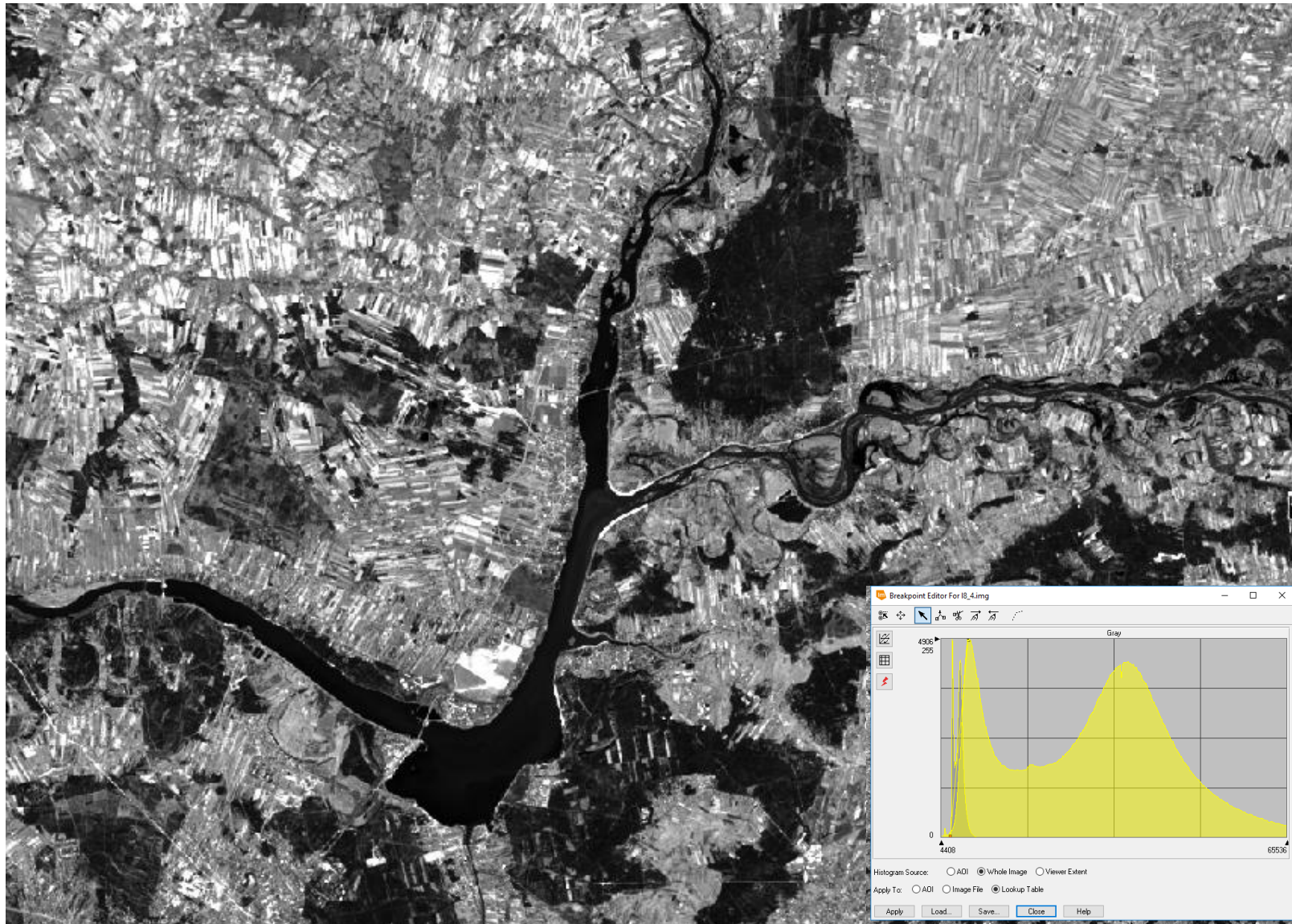


quality correction

spectral indices

machine learning
basics

Remote sensing II



quality correction

spectral indices

machine learning
basics

Remote sensing II

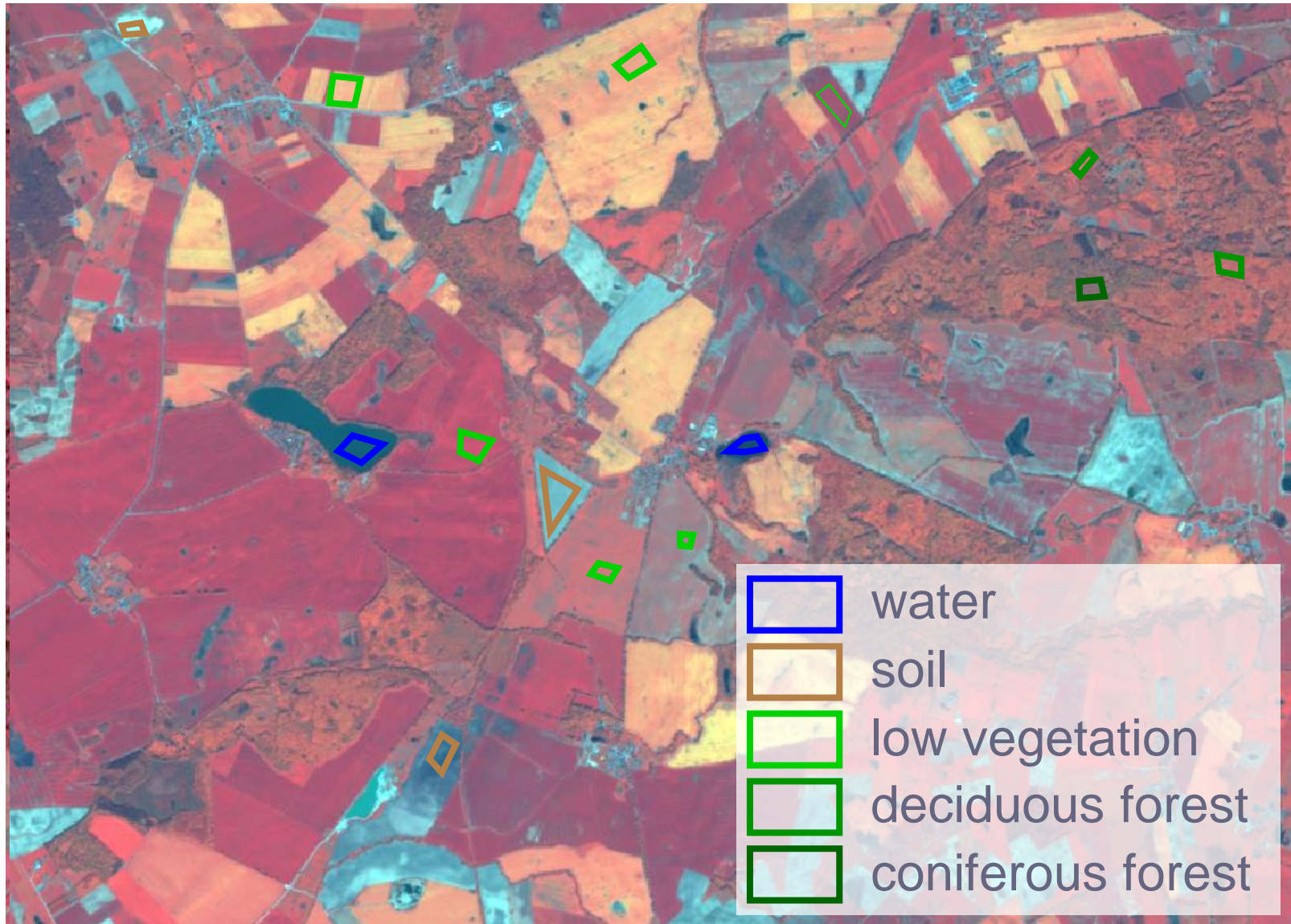


quality correction

spectral indices

machine learning
basics

Remote Sensing II



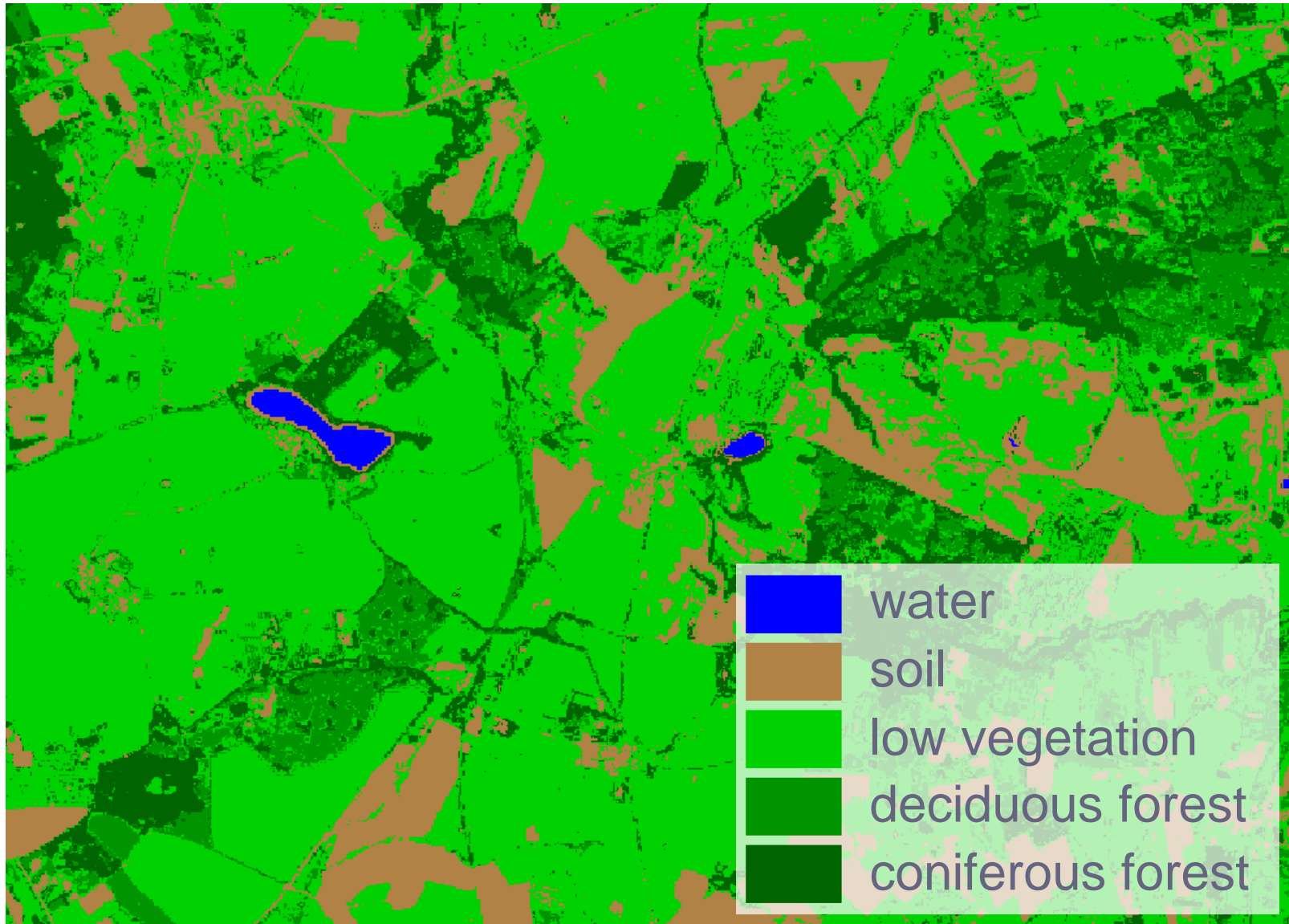
non-contextual

mathematical
morphology

machine learning

programming
(Python)

Remote Sensing II



non-contextual

mathematical
morphology

machine learning

programming
(Python)

Digital image processing



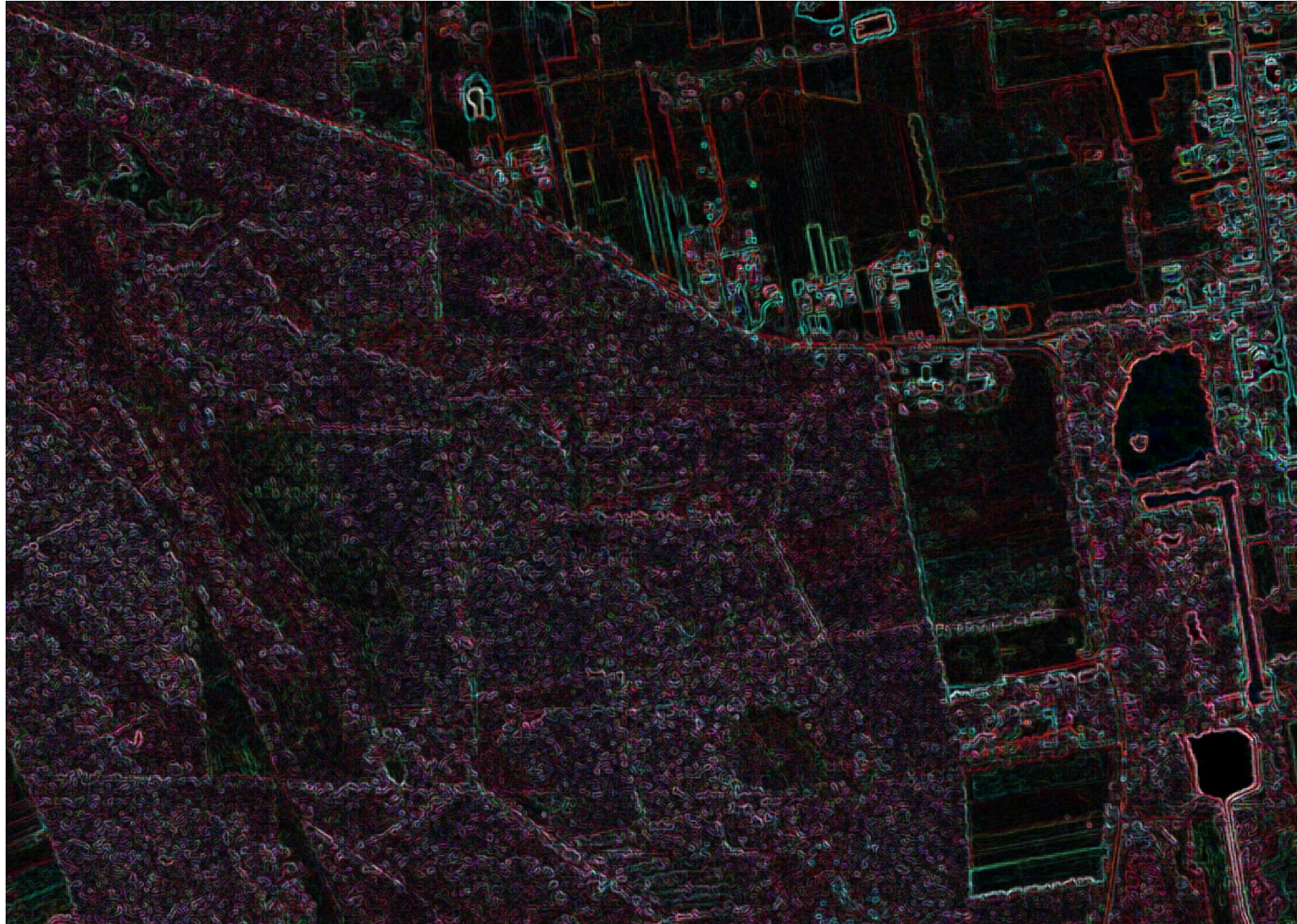
non-contextual

mathematical
morphology

machine learning

programming
(Python)

Digital image processing



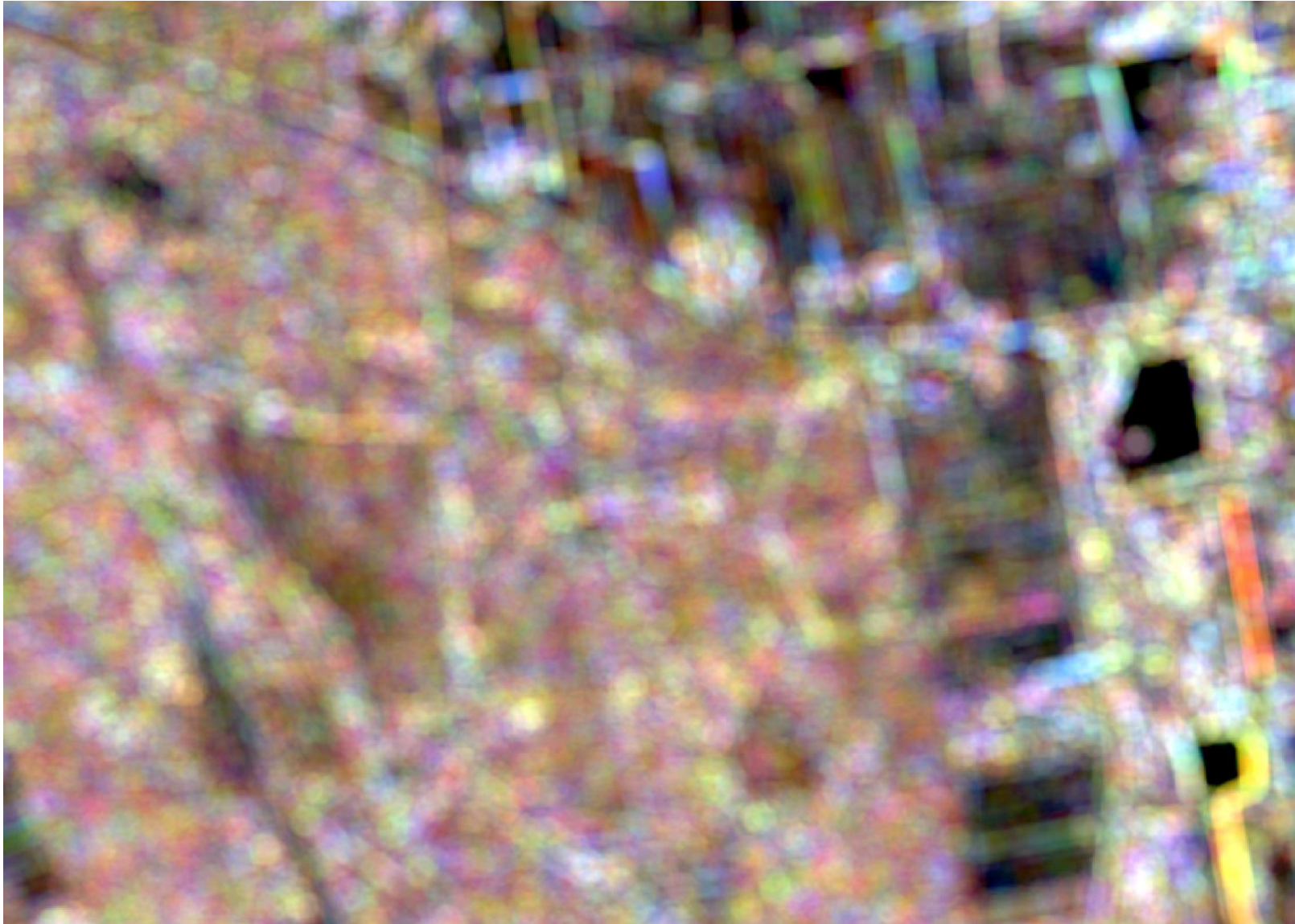
non-contextual

mathematical
morphology

machine learning

programming
(Python)

Digital image processing



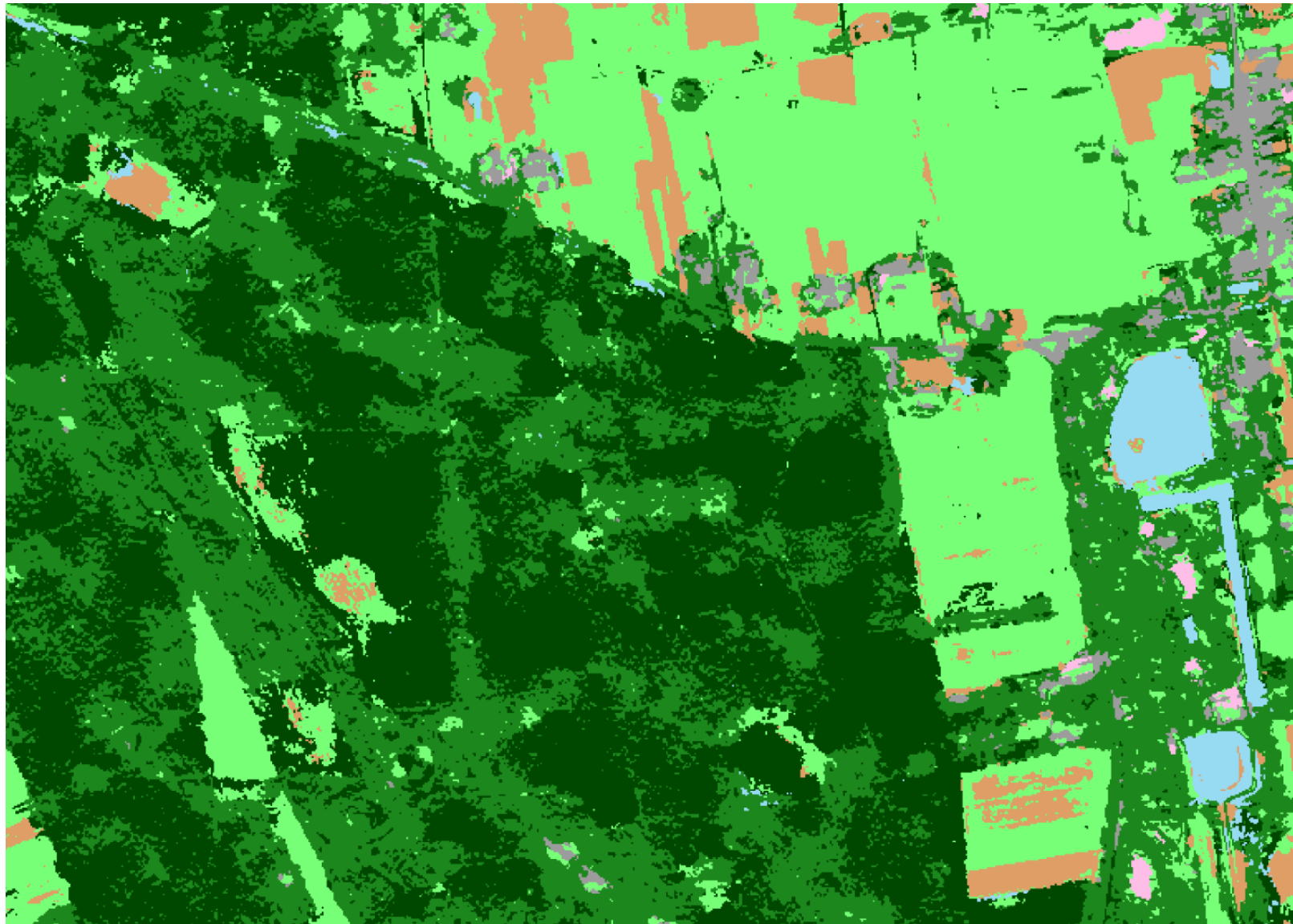
non-contextual

mathematical
morphology

machine learning

programming
(Python)

Digital image processing



non-contextual

mathematical
morphology

machine learning

programming
(Python)

Digital image processing

6. Transformacja i klasyfikacja całego obrazu

```
In [11]: 1 # transformacja całego obrazu
2
3 kanaly=[]
4 for i in range(len(coll)):
5     kanal = np.asarray(coll[i].data).flatten()
6     kanaly.append(kanal)
7
8 X_all=np.stack(kanaly).T
9
10
```

```
In [12]: 1 # klasyfikacja całego obrazu
2 Pred_dt = dt_clf.predict(X_all)
```

```
In [13]: 1 # re-transformacja i wyświetlenie wyników
2
3 # obraz oryginalny
4 plt.figure(figsize=(20,10))
5 plt.imshow(im_comp)
6
7 # obraz sklasyfikowany
8 Pred_im_dt = Pred_dt.reshape(coll[0].shape)
9 plt.figure(figsize=(20,10))
10 plt.imshow(Pred_im_dt)
11
12 # legenda
13 legenda()
```



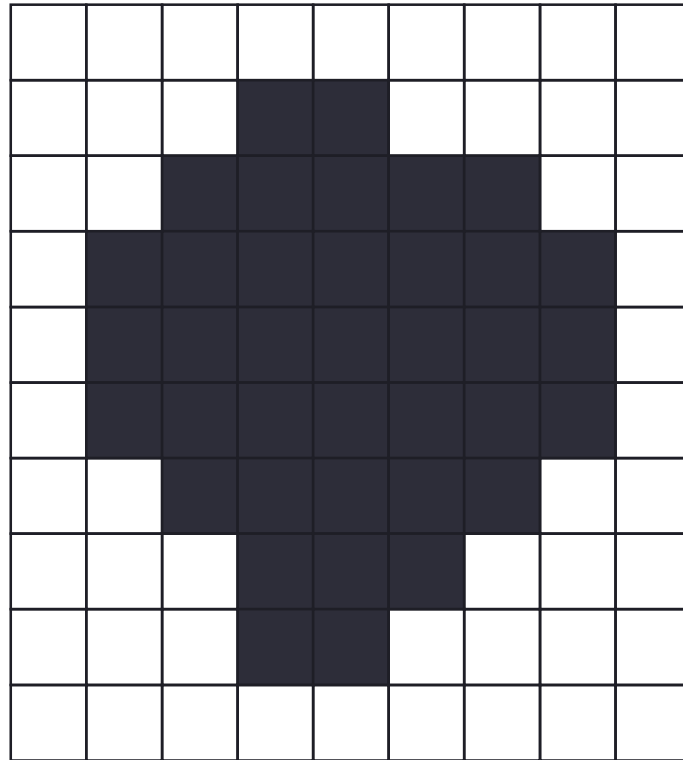
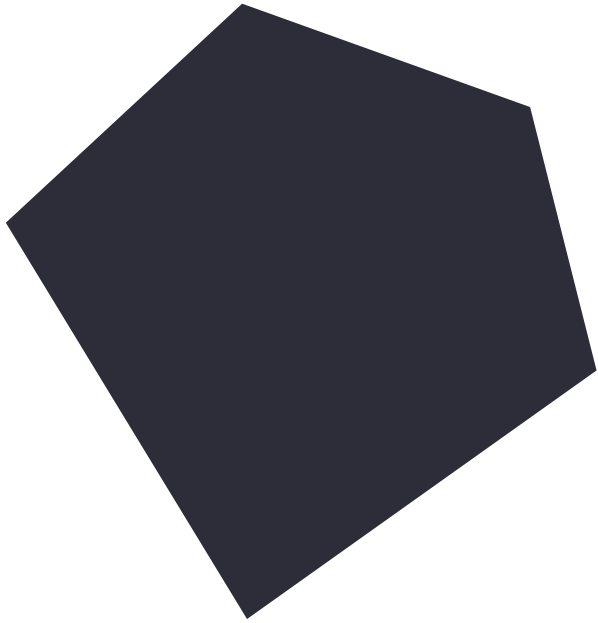
non-contextual

mathematical
morphology

machine learning

programming
(Python)

GIS



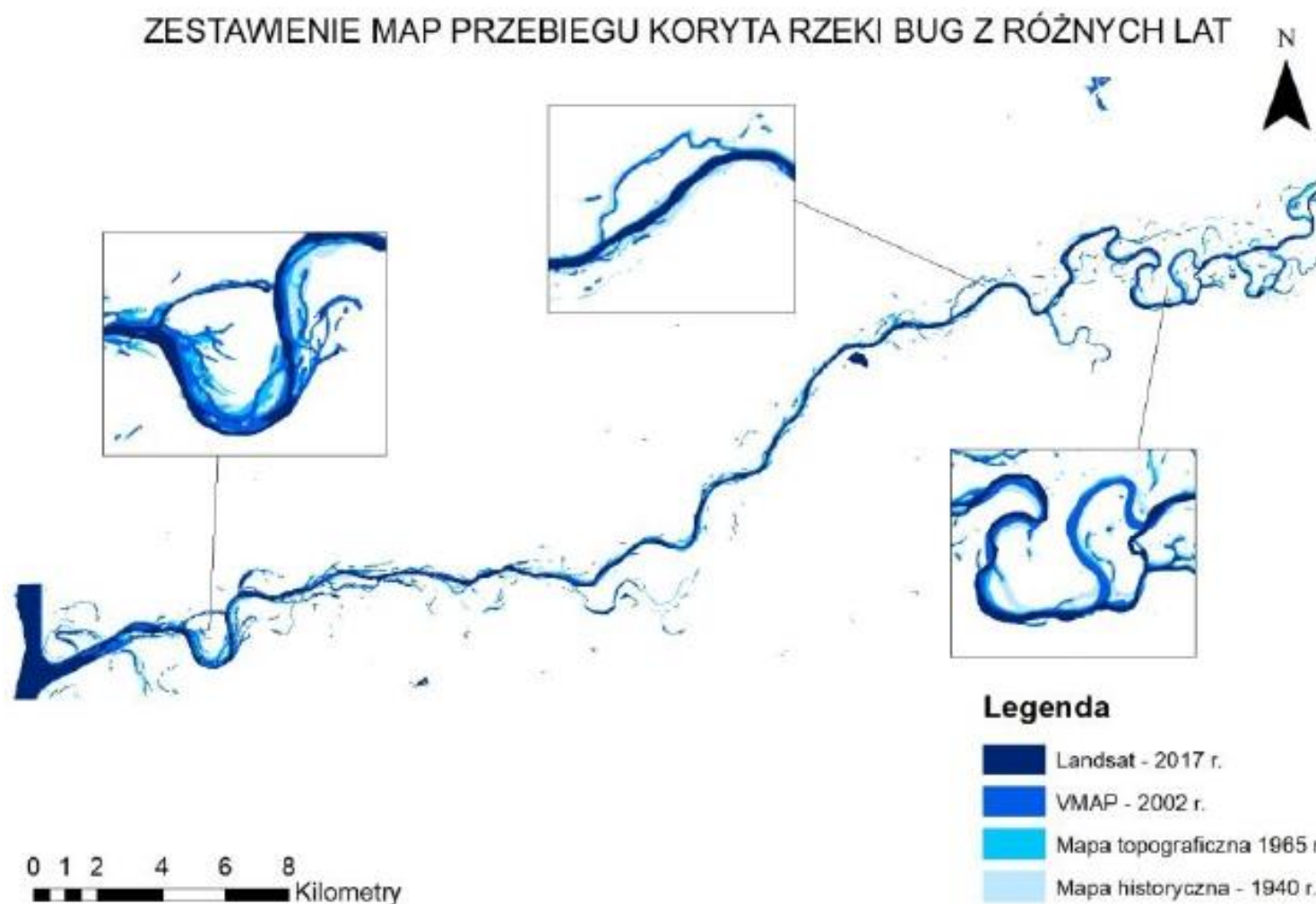
spatial data
formats

GIS



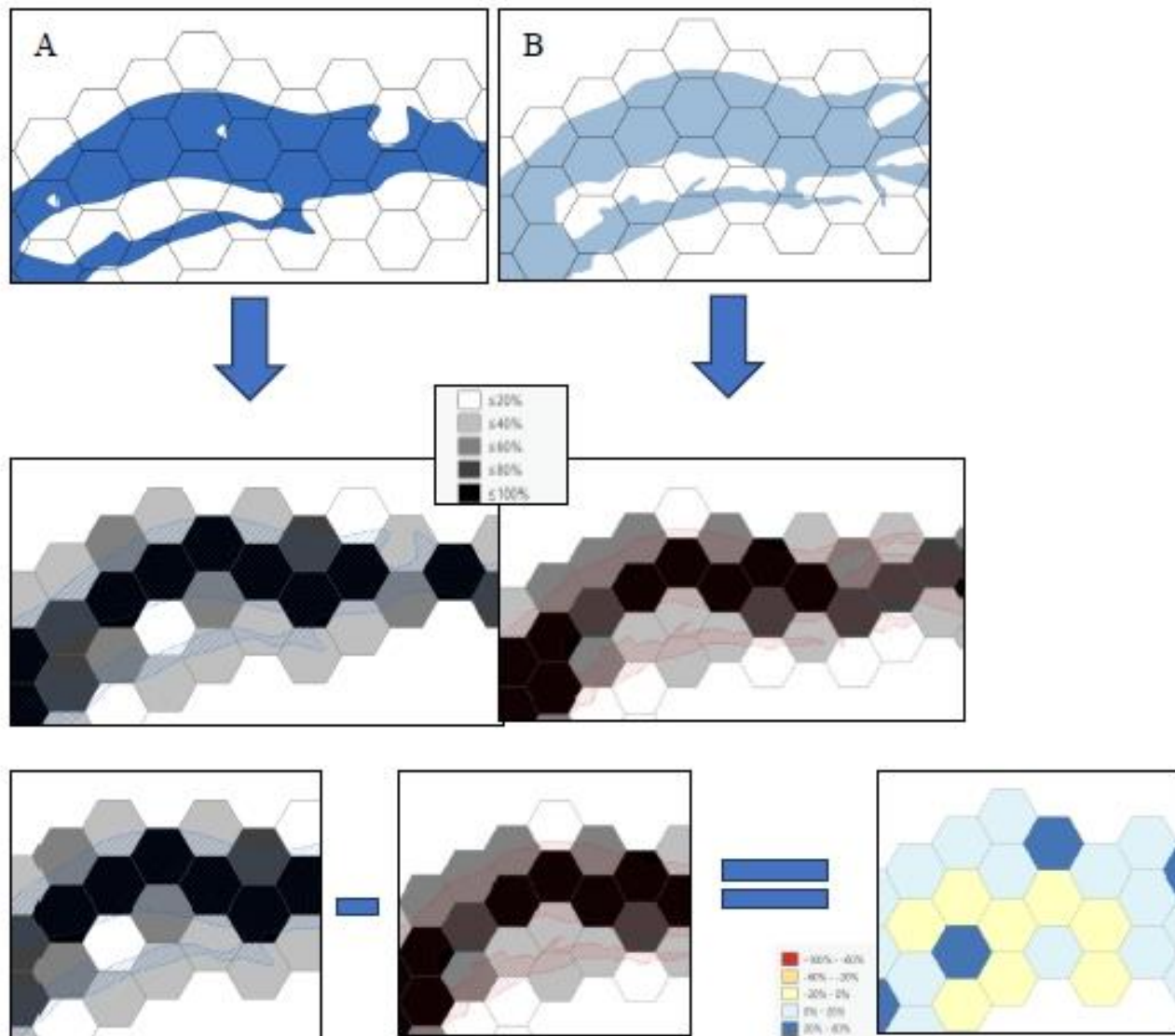
spatial data
formats
different data
sources

GIS



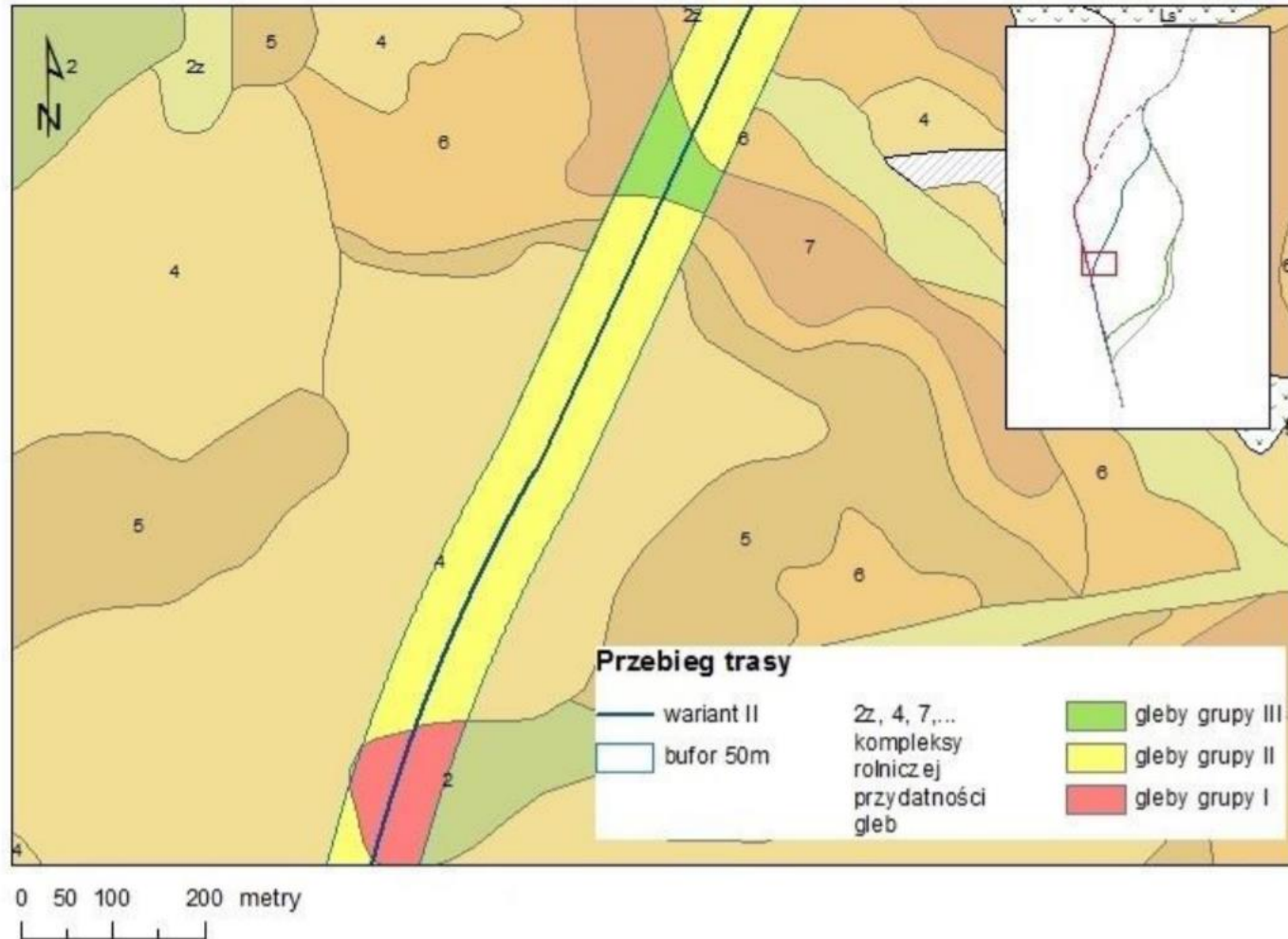
spatial data
formats
different data
sources
basic analysis

GIS



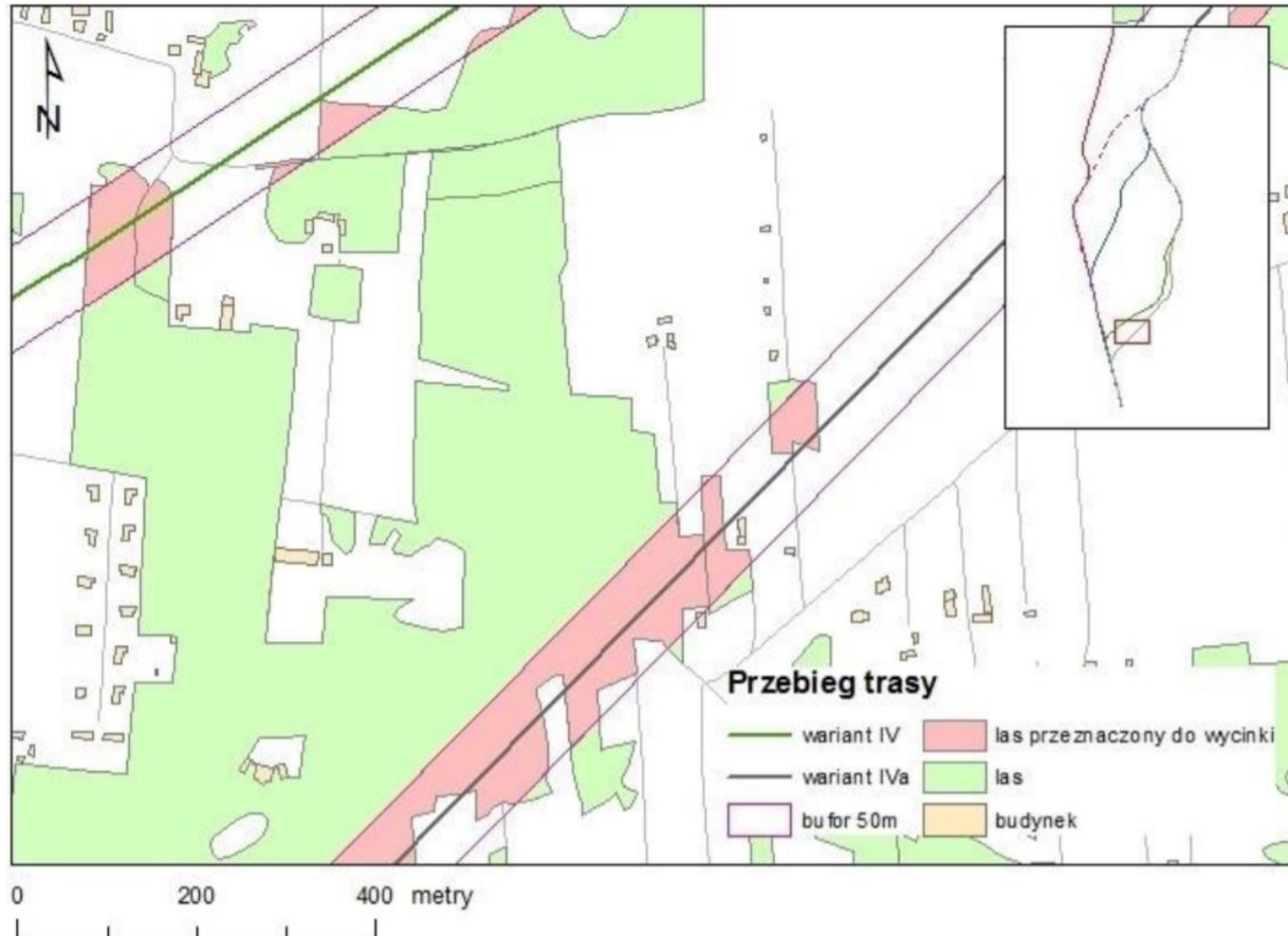
spatial data
formats
different data
sources
basic analysis

Spatial analysis



multi-criteria
analyses

Spatial analysis



multi-criteria
analyses

Spatial analysis



multi-criteria
analyzes
network analyzes

Spatial analysis



multi-criteria
analyzes
network analyzes

Spatial analysis



multi-criteria
analyzes
network analyzes

individual and
group projects

Other EO subjects



Przemysław Kupidura

`przemyslaw.kupidura@pw.edu.pl`



**Faculty of Geodesy
and Cartography**

WARSAW UNIVERSITY OF TECHNOLOGY