Jan Evangelista Purkyně University in Ústí nad Labem

Faculty of Environment

# Study material

# GEOSPATIAL DATA: SOURCES AND ANALYSIS

doc. Ing. Jan Pacina, Ph.D.

EUROPEAN UNION
European Structural and Investment Funds
Operational Programme Research,
Development and Education

MINISTRY OF EDUCATION,
YOUTH AND SPORTS

STUVIN - Education, research and innovation of science and technical doctoral programmes
on J. E. Purkyně Univerzity in Ústí n.L., reg. n. CZ.02.2.69/0.0/0.0/16_018/0002735

## Objectives

Aim of the course is to introduce different types of spatial data available for the whole World. Within the course, students will learn about the data acquisition methods, processing, interconnection, analysis and interpretation. Within the course we will work with remotely sensed data (satellite imagery, InSar, LiDAR), spatial data repositories (old maps, aerial imagery, vector data) and available statistical data. The fast growing GIS cloud services are covered within the course as well as their offer wide range of different types of spatial data maintained by the GIS community. Processing, analysis and visualization of the selected spatial data will be performed using commercial and open-source GIS tools.

## Study topics

1. Satellite imaging – repositories, processing methods, classification and result interpretation

2. InSar and LiDAR – data sources, repositories, raw data processing, visualization

3. Aerial imagery – methods of photogrammetric processing, orthophoto and DSM derivation

4. Old maps – types of old maps, repositories, processing methods (georeferencing), digitalization (manual, automatic) and interpretation

5. Vector and statistical data – national data libraries, EU data repositories

6. Cros-data processing, analysis and visualization.

## Study literature

ArcGIS Pro manuals

QGIS manuals

ESA data processing manuals

Riegl data processing manuals

HERITAGE, G. L., LARGE, A. R.G. Laser scanning for the environmental sciences. Chichester, UK: Wiley-Blackwell, 2009. ISBN 9781444311945.

MATTHEW J. ABICHT, DAVID C. COWLEY, ROBIN A. STANDRING. Landscapes Through the Lens: Aerial Photographs and the Historic Environment. Oxbow Books. 2010. 978-1842179819

REES W G. Physical Principles of Remote Sensing. Cambridge University Press, 2012. 978-1139851374.

JONES H., VAUGHAN R A. Remote Sensing of Vegetation: Principles, Techniques, and Applications. OUP Oxford. 2010. 978-0199207794.