

003: Earth Observation Data Analysis

Lectures

1. Introduction into the Case Study <https://www.youtube.com/watch?v=u9n3hkuwO2g>
2. Predictive Modelling https://www.youtube.com/watch?v=X1H8g_LaNQ0

Lecture Questions

As machine learning and spatial modelling is probably a new field for you, try to make sense of all the important terms first:

- What are predictors and what is a response variable?
- What problems can occur if we say a model is “overfitted”?
- How can one detect if a model is overfitted?
- What is the difference between a classification and a regression model?

Reading Task

Read the Article "[Decision-Tree, Rule-Based, and Random Forest Classification of High-Resolution Multispectral Imagery for Wetland Mapping and Inventory](#)" by Tedros M. Berhane et al. (2018). You can download the article [here](#) as it is published as open access.

While the topic of this article is about wetland mapping (i.e. called a categorical map in the [article yesterday](#)), it is also a very nice introduction to the machine learning workflow in a practical example without being too technical. If you do not understand the text word for word, do not worry - we will discuss the main outcomes and messages in person next week. For now focus on the main ideas and try to answer the following questions:

- What is a decision tree?
- What is the difference between a decision tree and a rule-based classification?
- What was the field data used for in this study?
- How was the remote sensing data processed prior to the classification?
- What positive and negative aspects do the authors identify for the usage of a random forest model for classifications?

R Practice

To put the modelling concepts into practice, [please download these resources](#) and find the Rscript TASK-modelling.R and data fogo_plots.csv. Open the .R file in Rstudio. It will guide you through to calculate a linear model. If this was easy for you, you can continue with the R practice in [004: Current Applications of Remote Sensing](#) where you will learn to train a random forest model.

You can find an [example solution here](#).

Lecture References

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