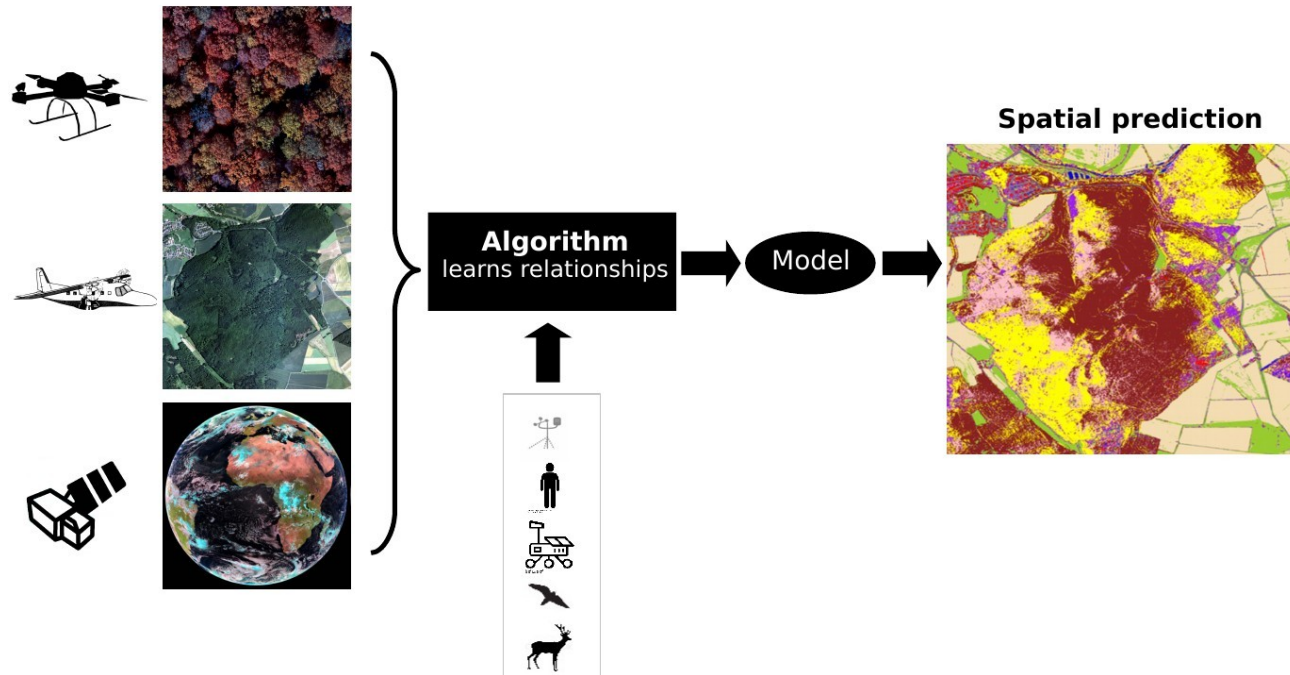


Remote sensing and machine learning:

Towards a spatio-temporal continuous monitoring of the environment

Hanna Meyer

Remote Sensing & Spatial Modelling,
Institute of Landscape Ecology, WWU Münster



Problem: From field observations to maps of ecosystem variables



Nature 4.0 | Sensing Biodiversity



Problem: From field observations to maps of ecosystem variables



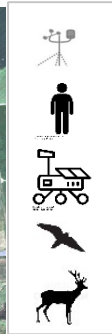
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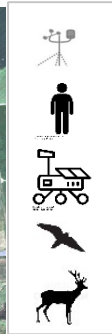
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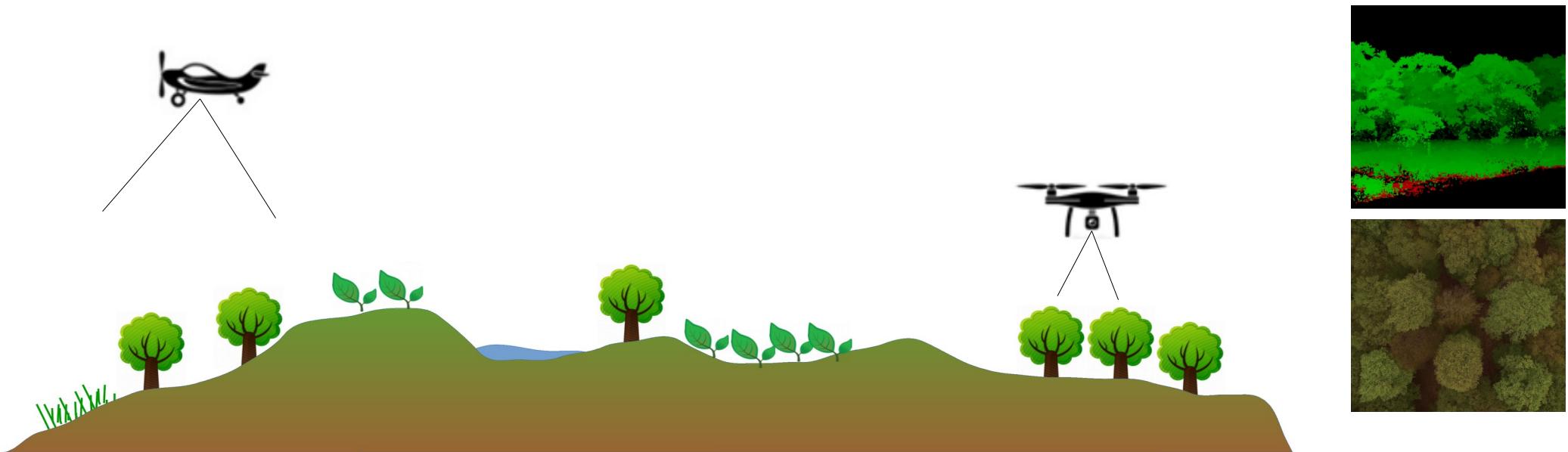
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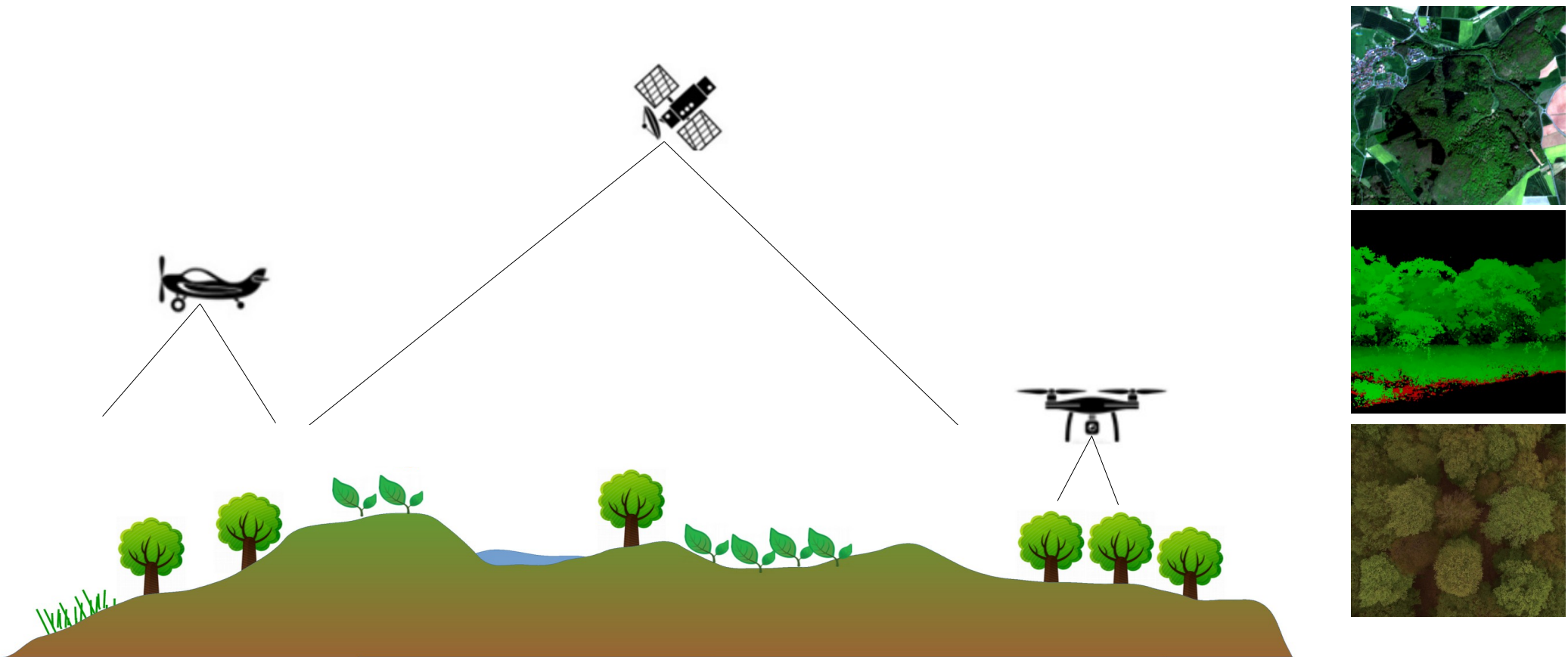
Remote Sensing of landscapes



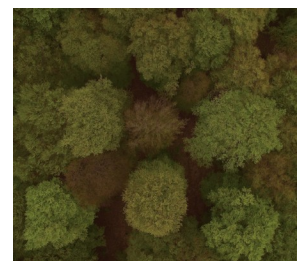
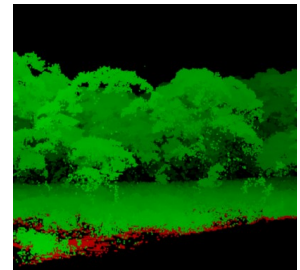
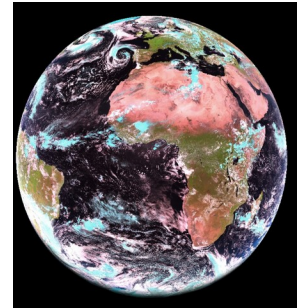
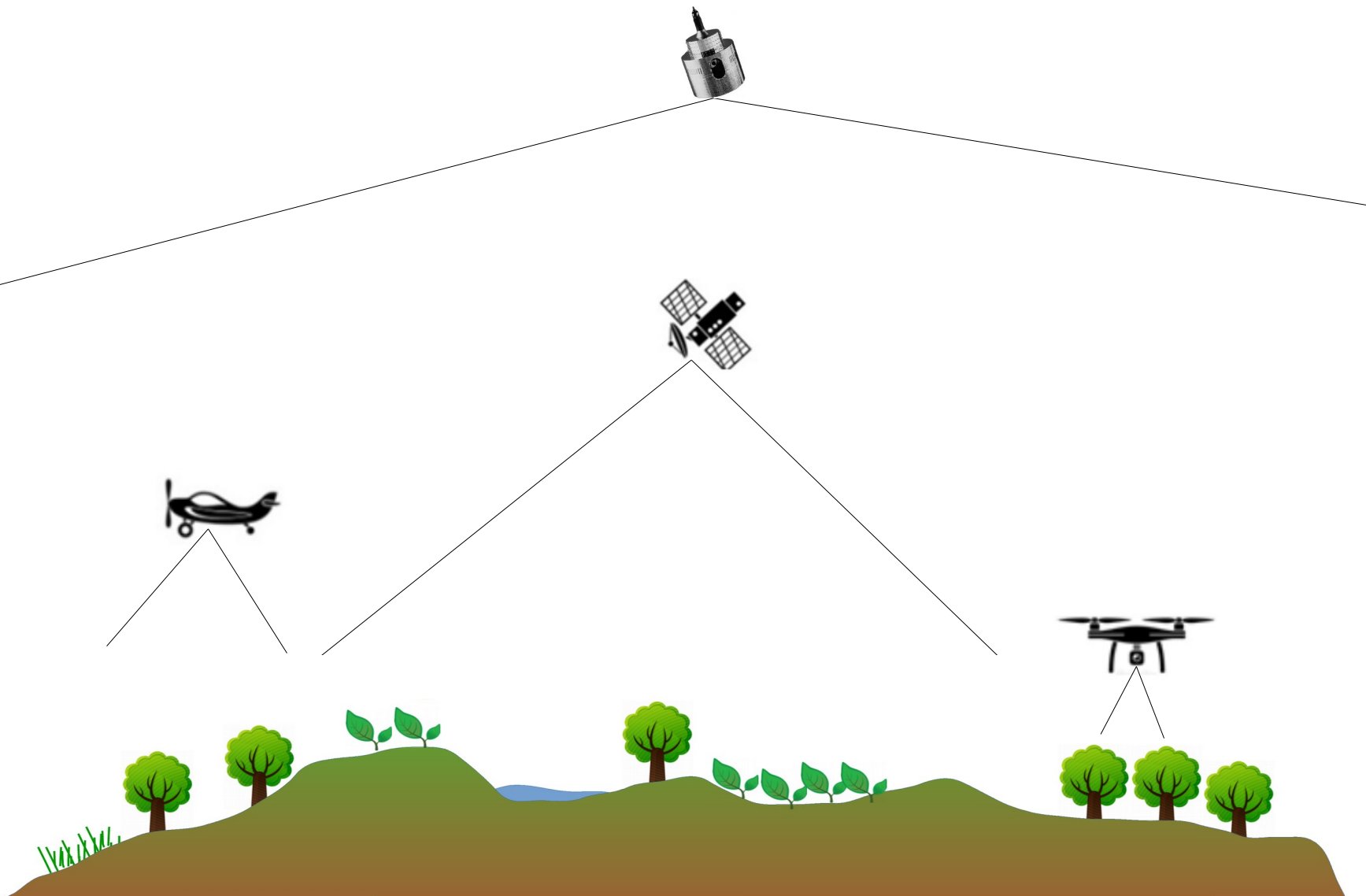
Remote Sensing of landscapes



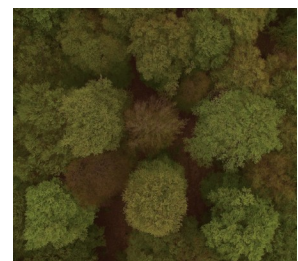
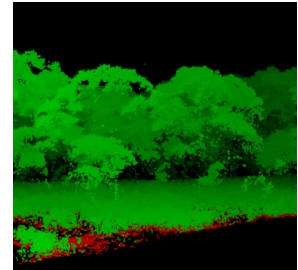
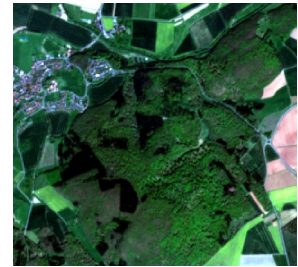
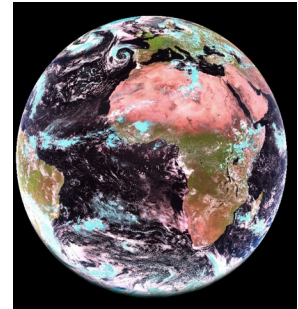
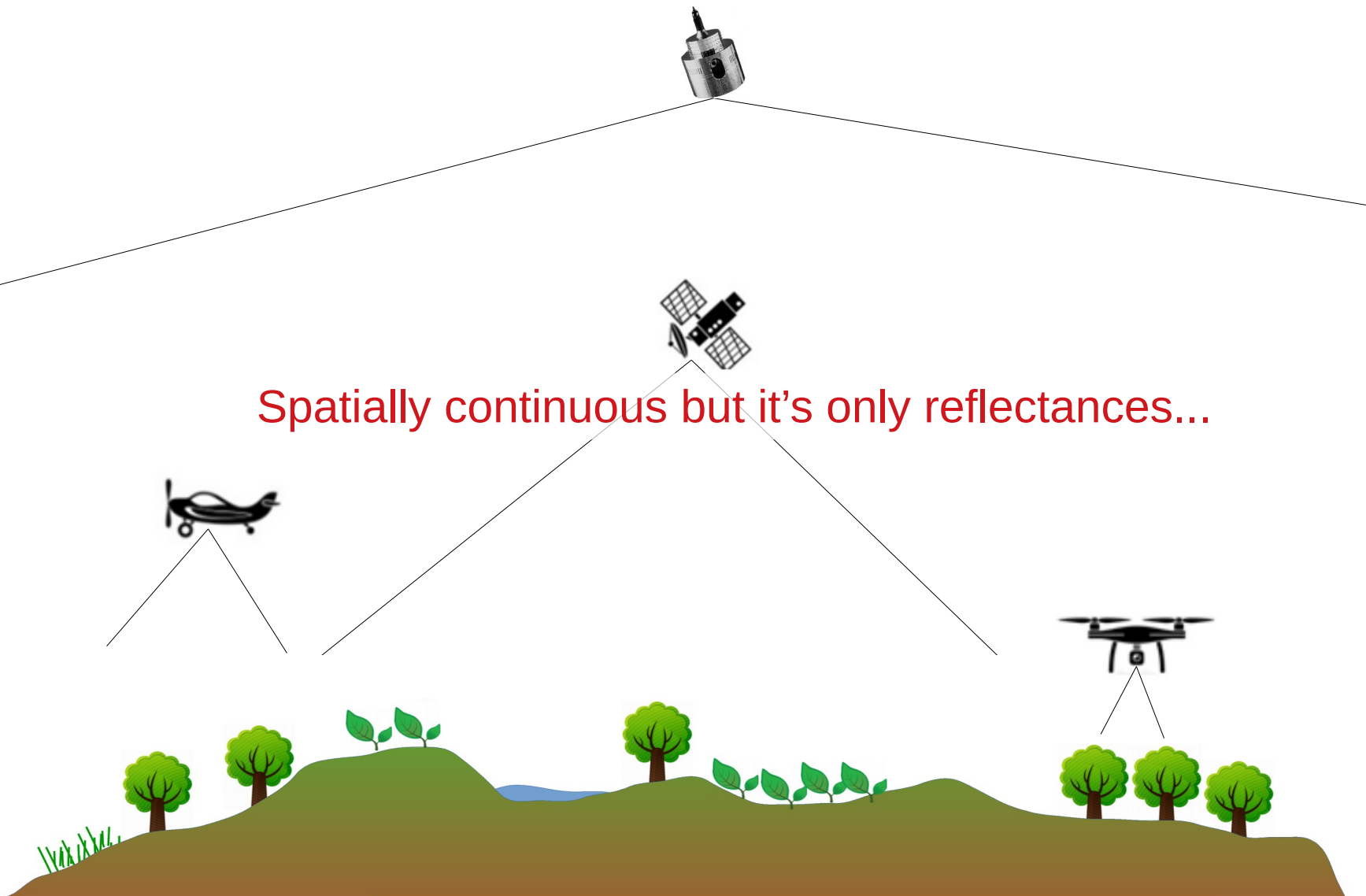
Remote Sensing of landscapes



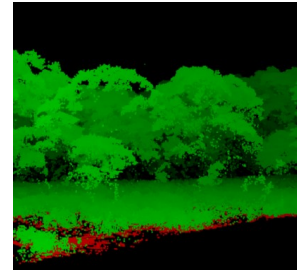
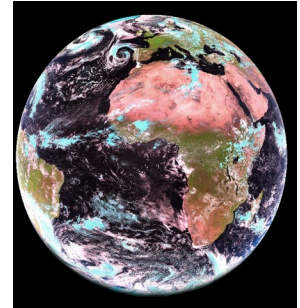
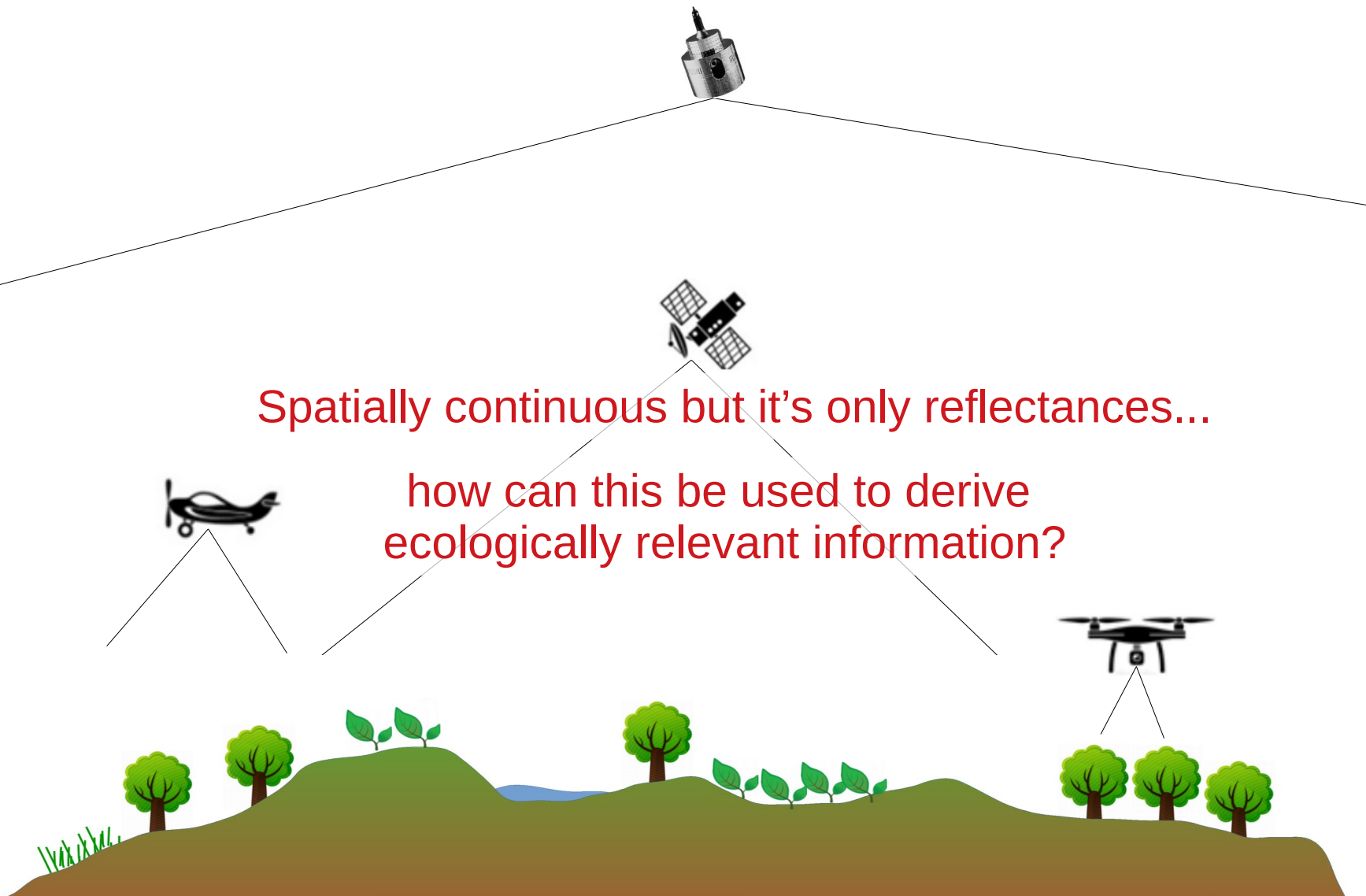
Remote Sensing of landscapes



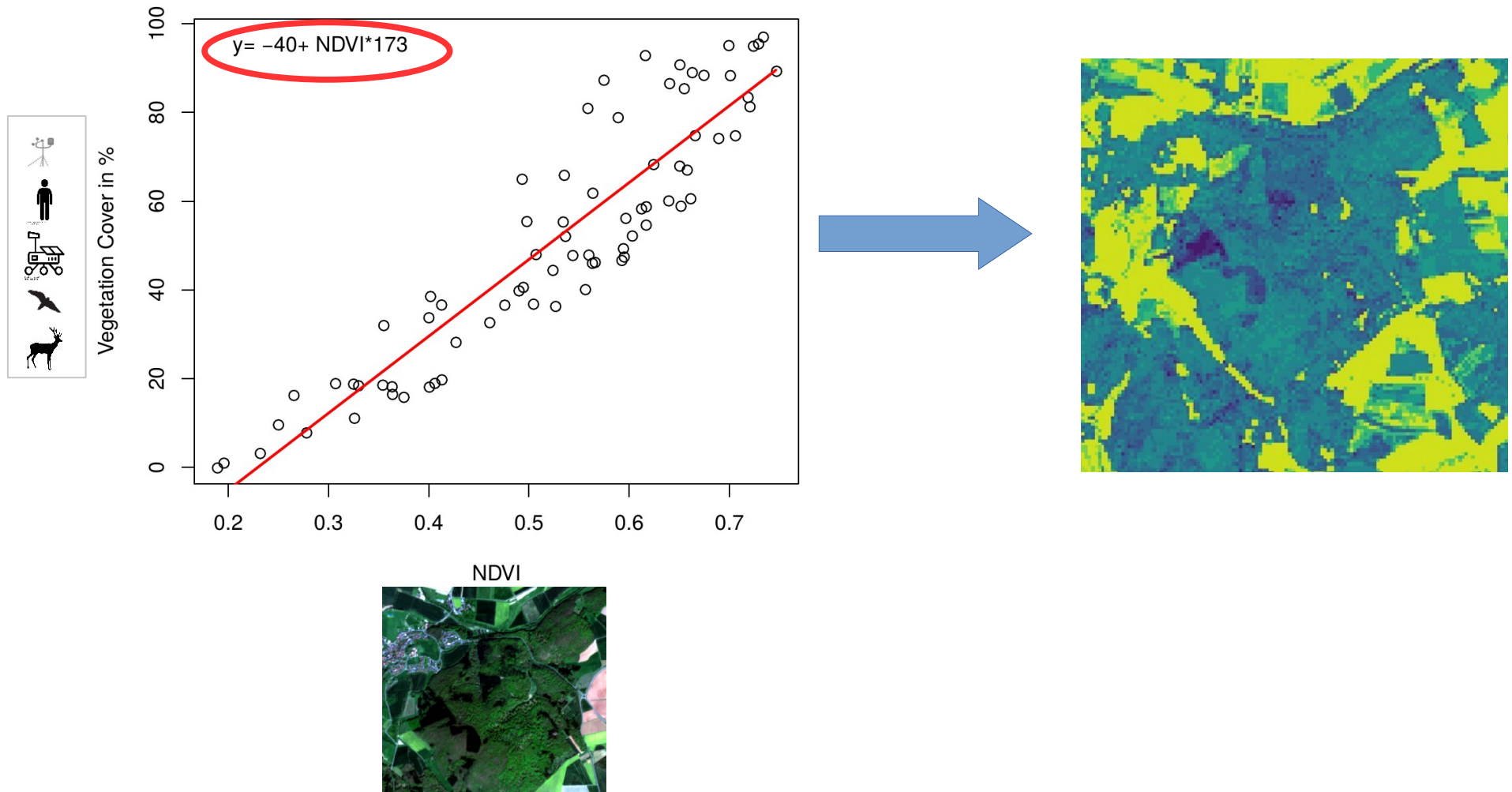
Remote Sensing of landscapes



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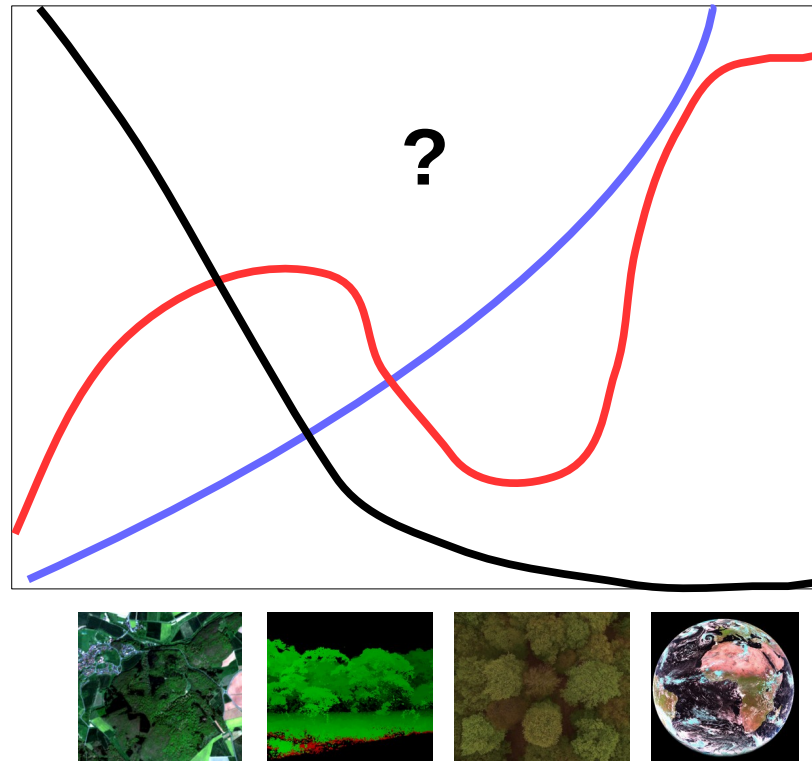
Predictive modelling of the environment



...but what about more complex variables?

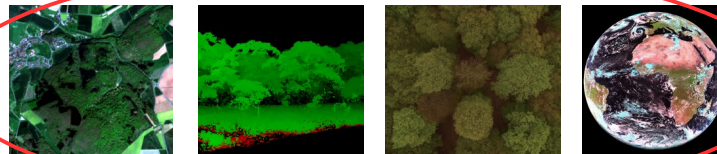
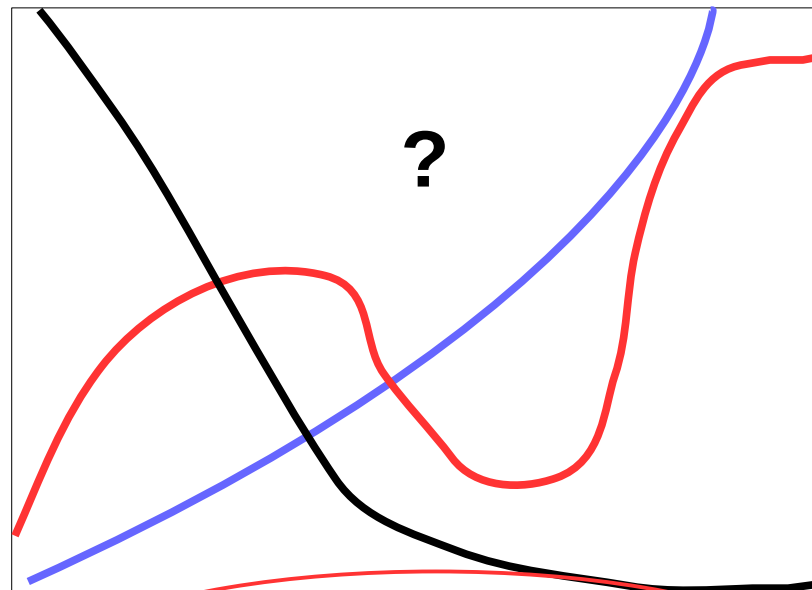
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Typical ecological variables from satellite?



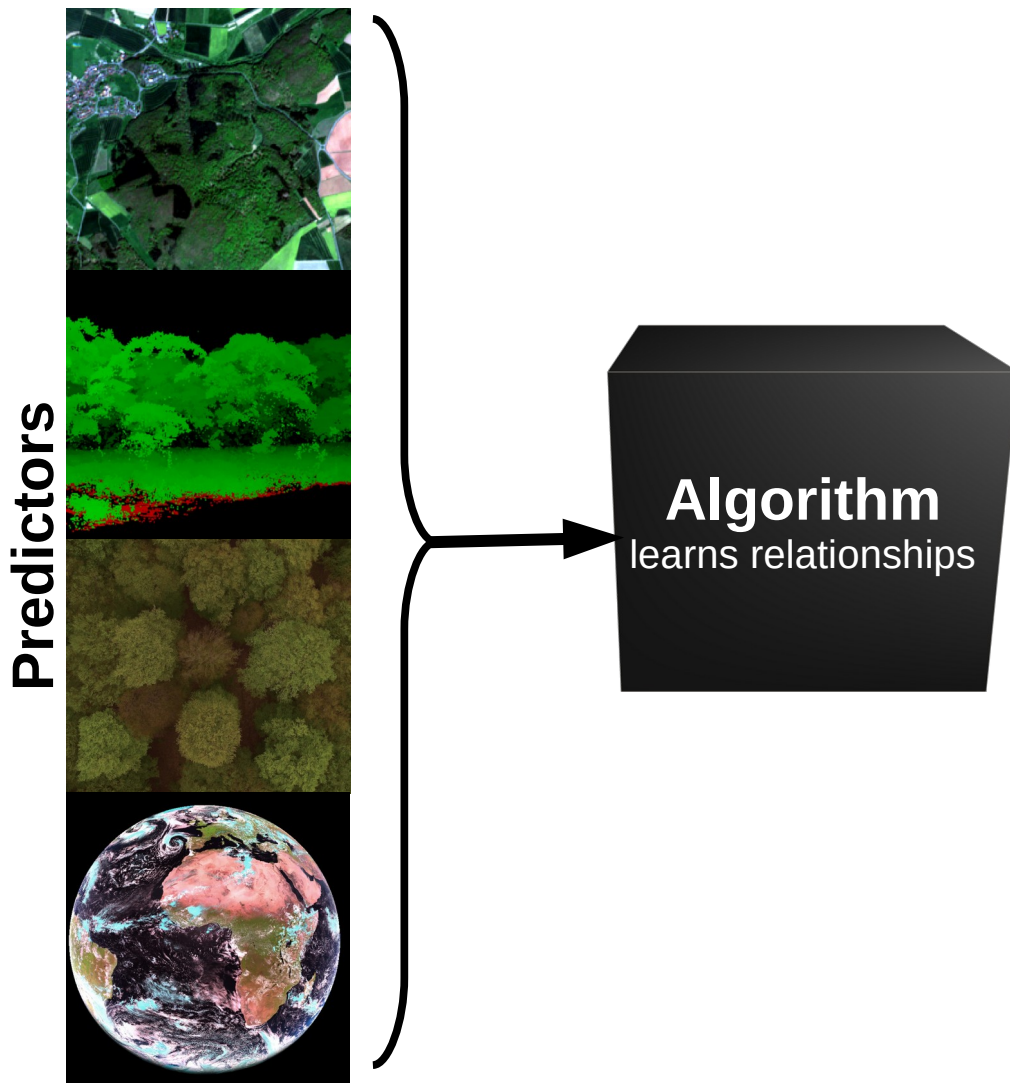
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Typical ecological variables from satellite?

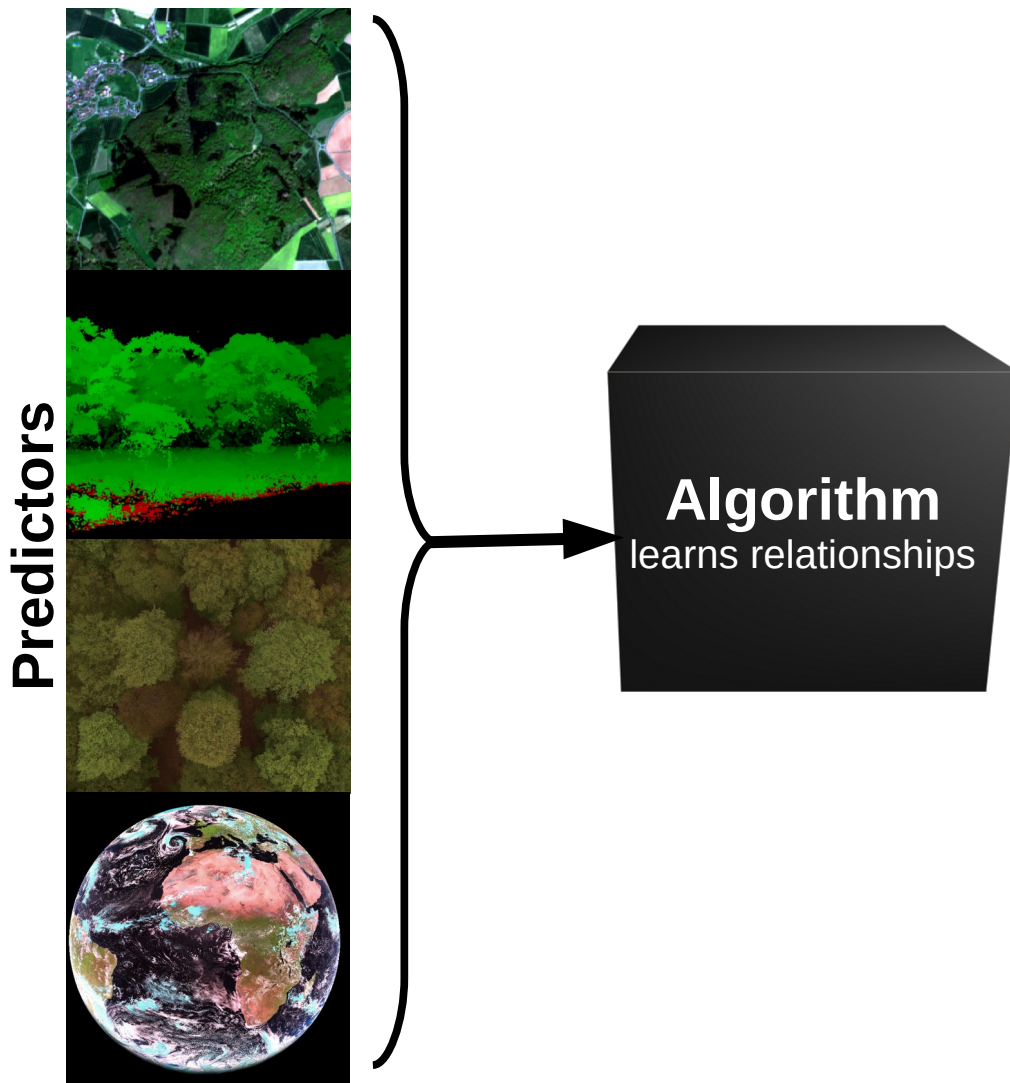


Models that can deal with complex nonlinear relationships are required!

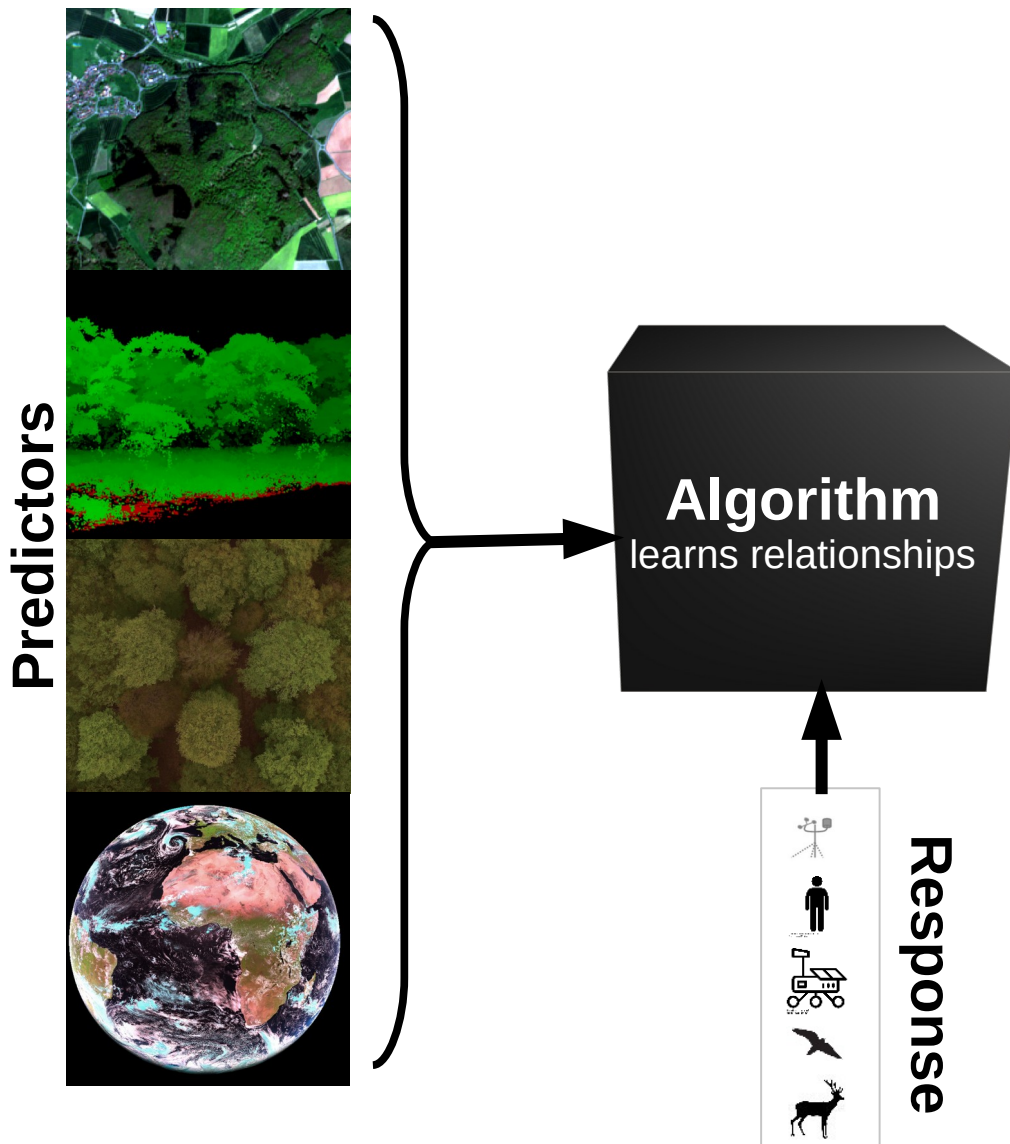
Predictive modelling of the environment: The machine learning way



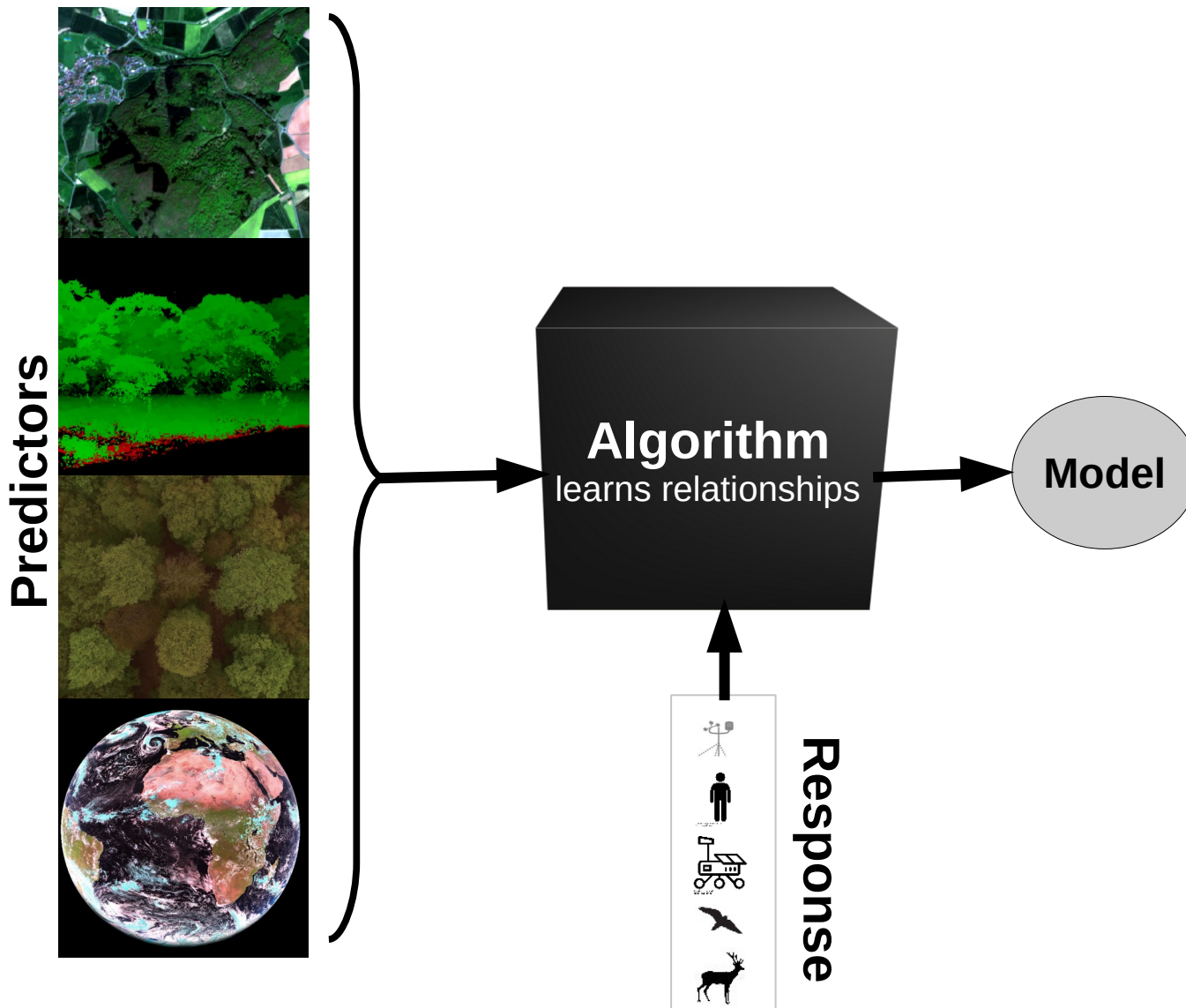
Predictive modelling of the environment: The machine learning way



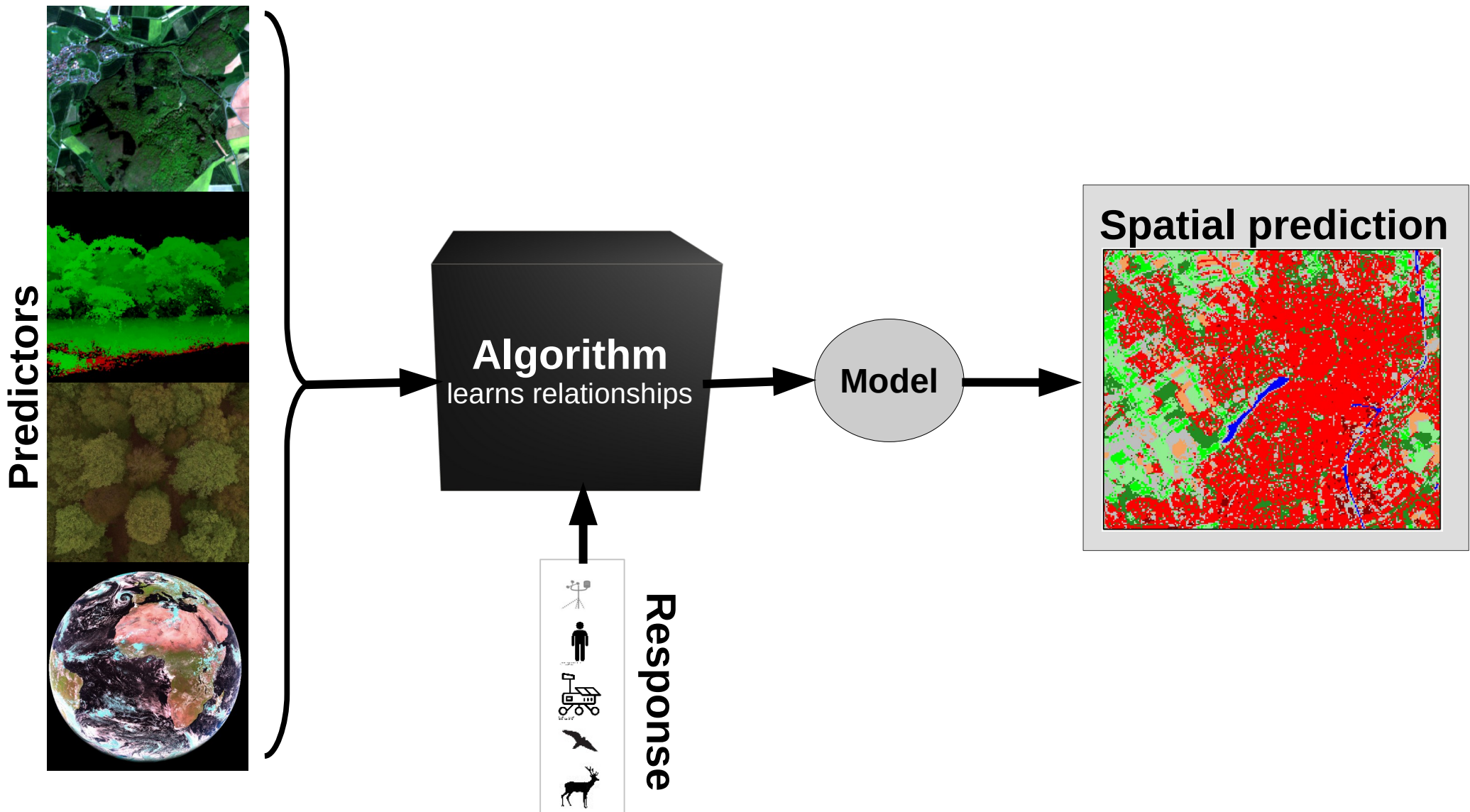
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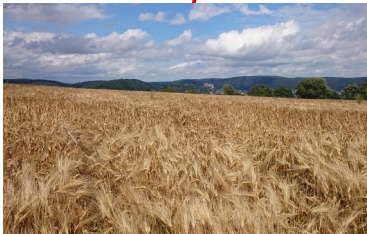
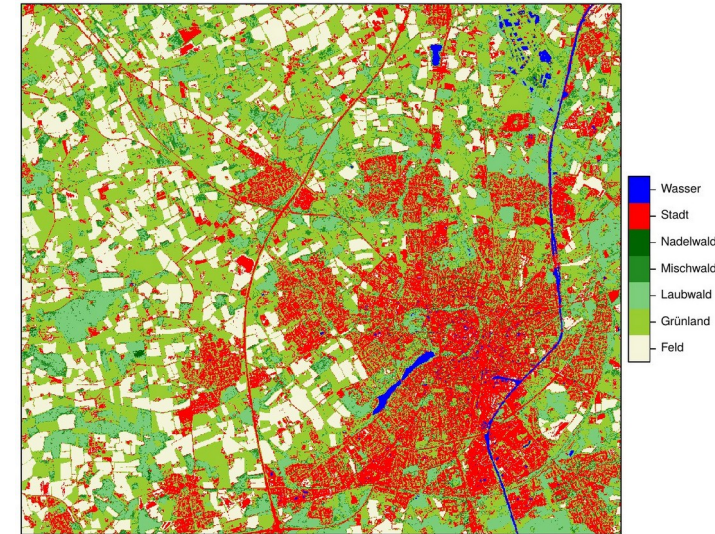
Predictive modelling of the environment: The machine learning way



Aim of this workshop



- Processing of remote sensing data
- Machine learning



- We will jointly look at the example of classifying land use/land cover for Münster
- But in parallel you will work on an own area of interest and perform a land use/land cover classification for this area

After this workshop you should be able to...

- Understand, handle and visualize remote sensing (satellite) data
- Use machine learning and remote sensing for spatial mapping of environmental variables
- Evaluate the quality of the maps

Outline

Day 1: Handling and processing of satellite data

- 1) Remote sensing data: introduction, access, handling & visualization
- 2) Calculations with remote sensing data: Vegetation indices etc.
- 3) Training data for Land use/ land cover classification

Day 2: Machine learning for land cover classification

- 4) Machine learning model training and prediction
- 5) Validation of models and maps