Remote sensing and machine learning:
Towards a spatio-temporal continuous monitoring of the environment

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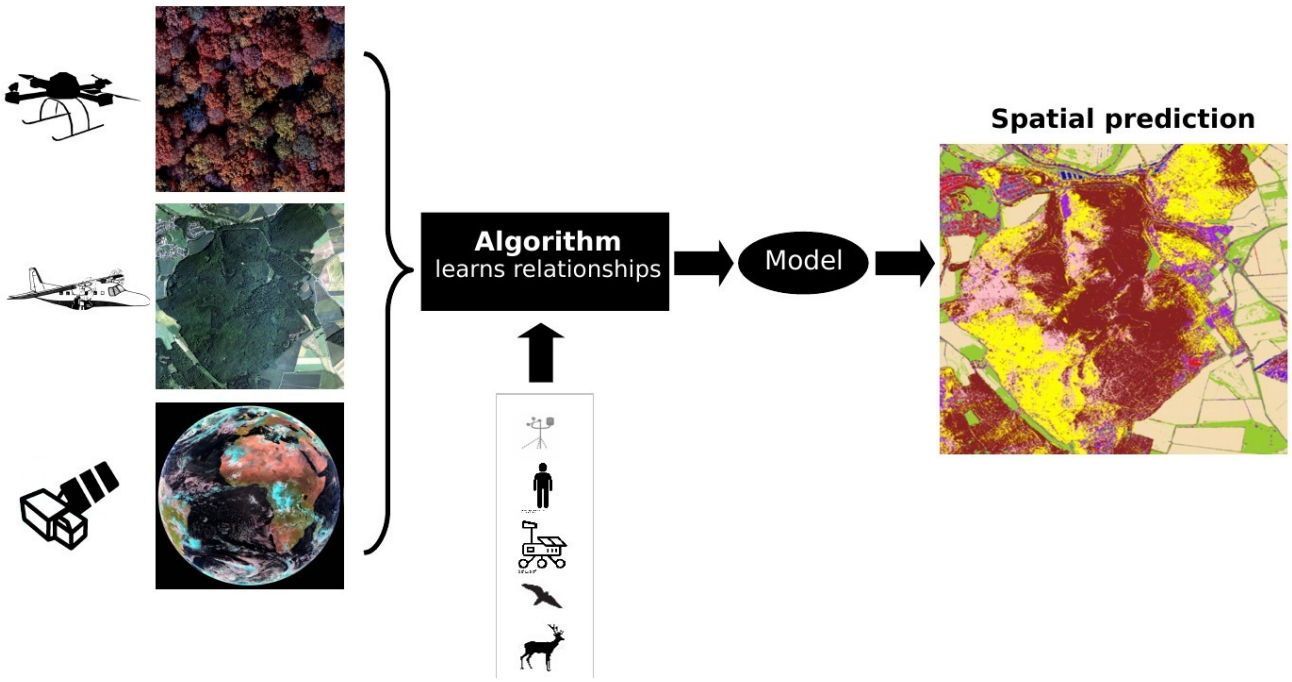
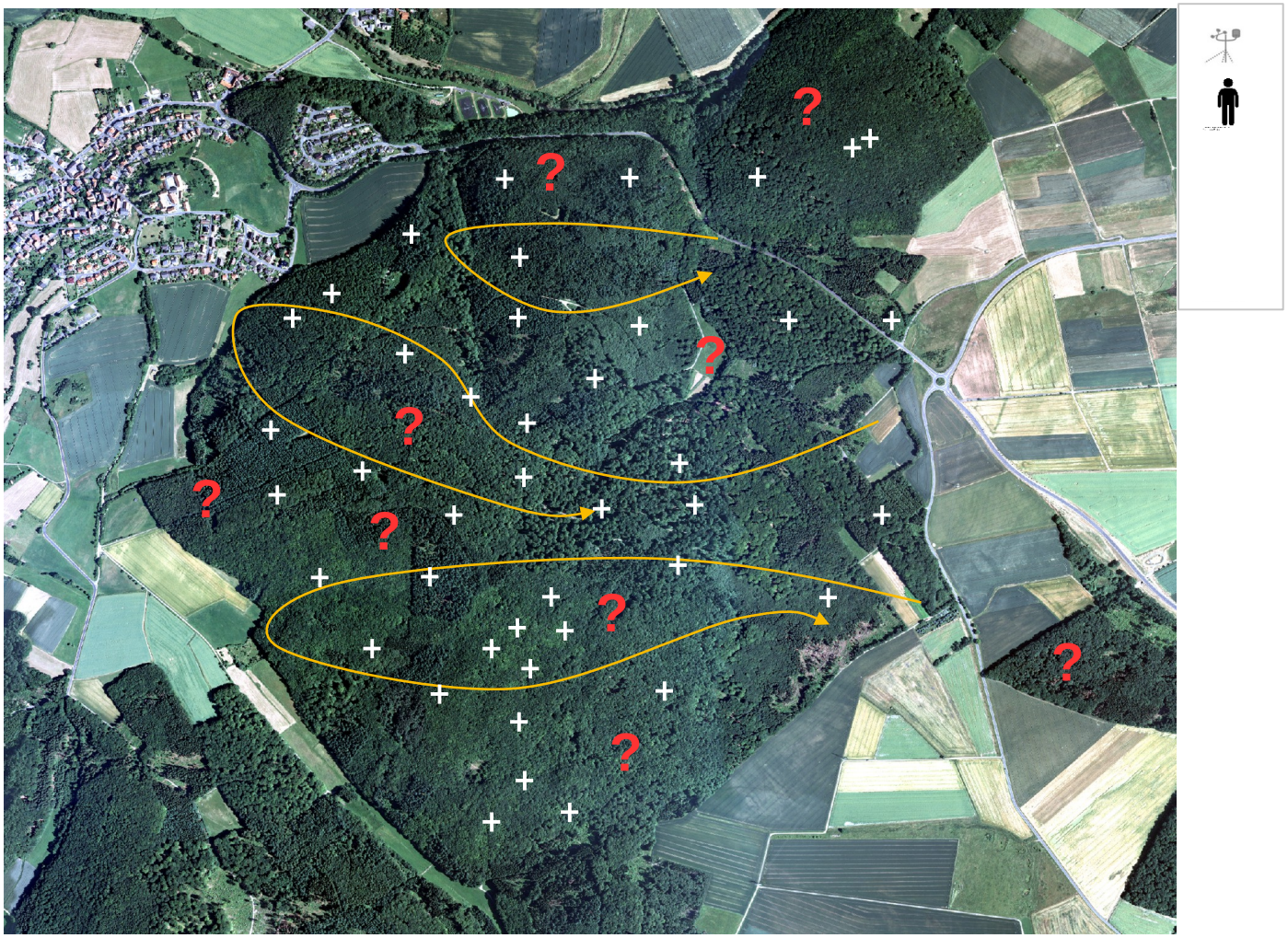
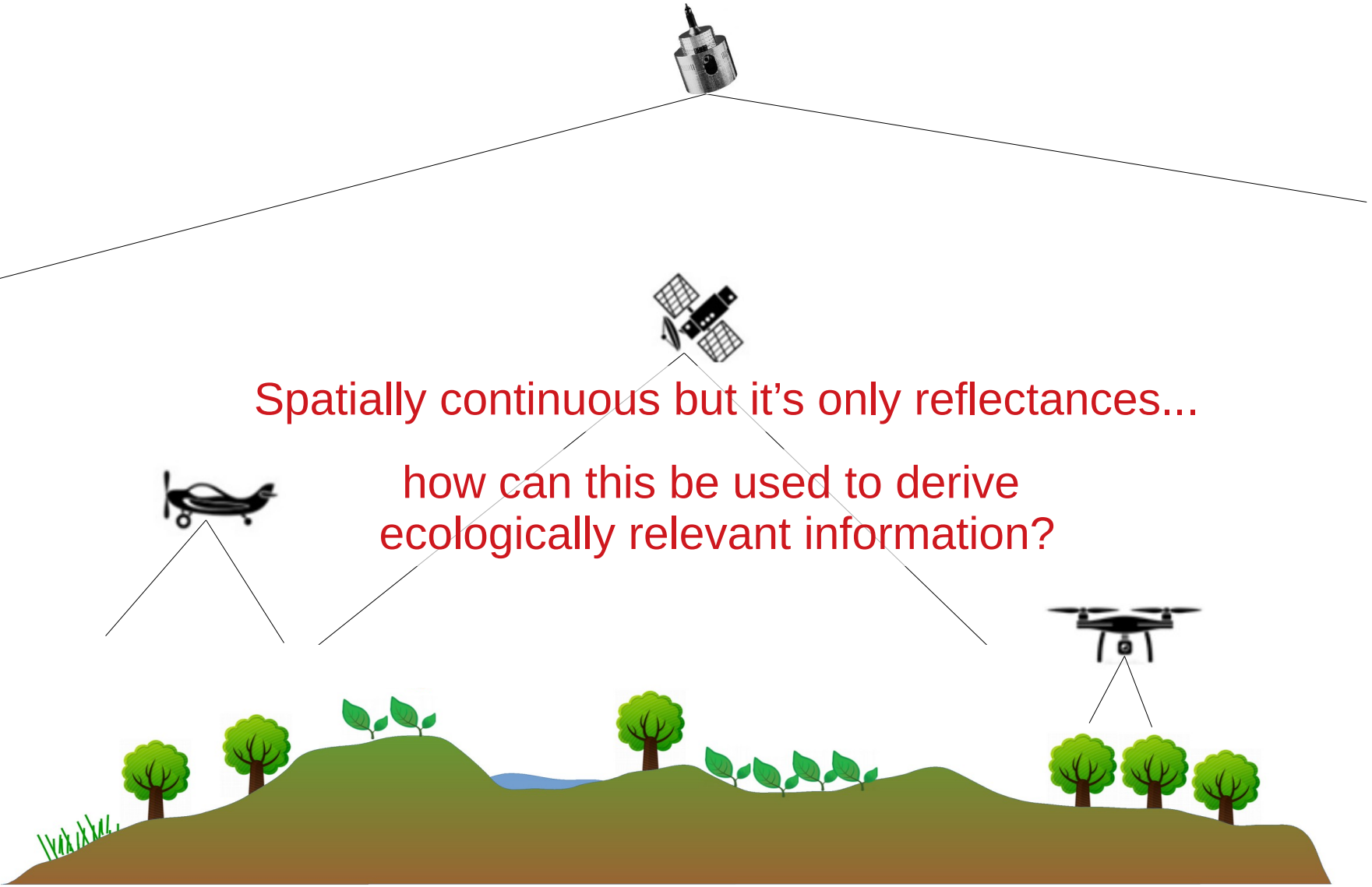


Problem: From field observations to maps of ecosystem variables

Nature 4.0 | Sensing Biodiversity

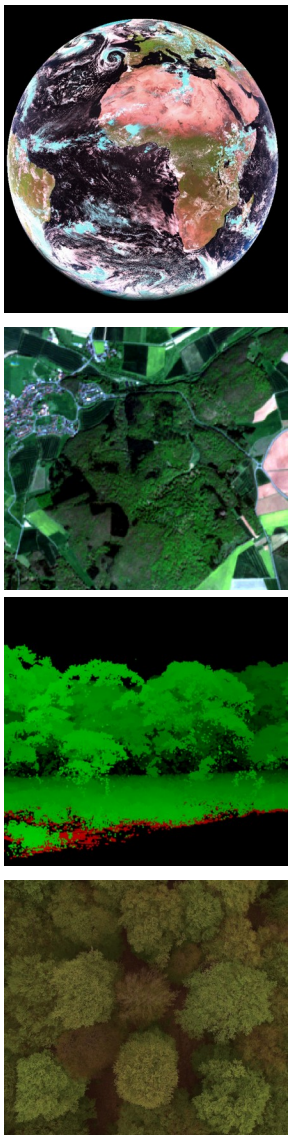


Remote Sensing of landscapes

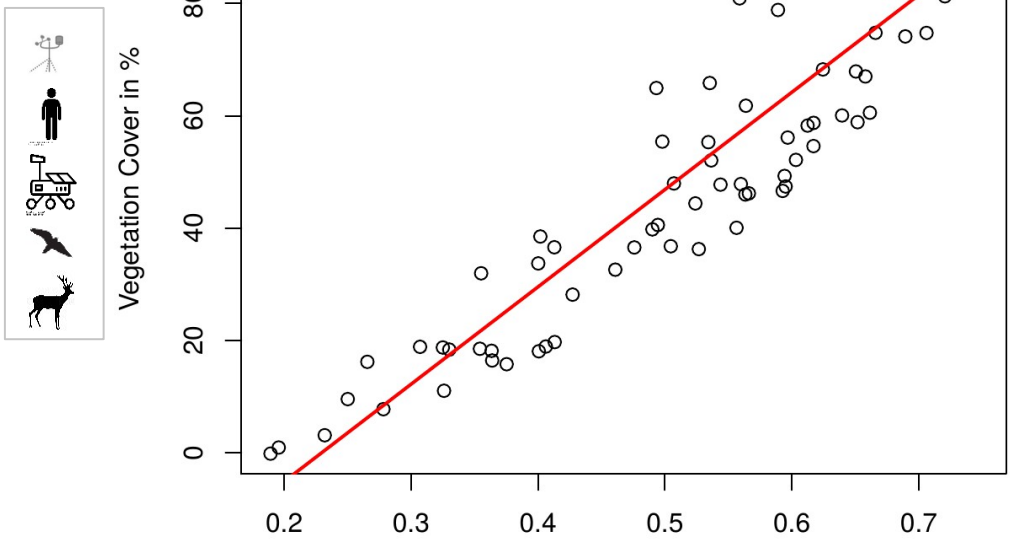


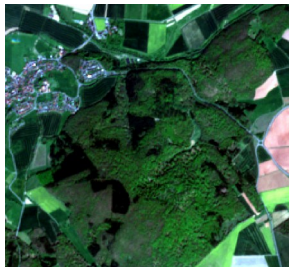
Spatially continuous but it's only reflectances...

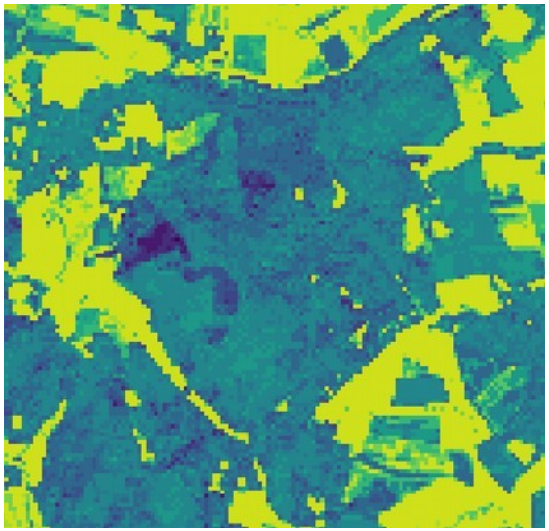
how can this be used to derive ecologically relevant information?



Predictive modelling of the environment

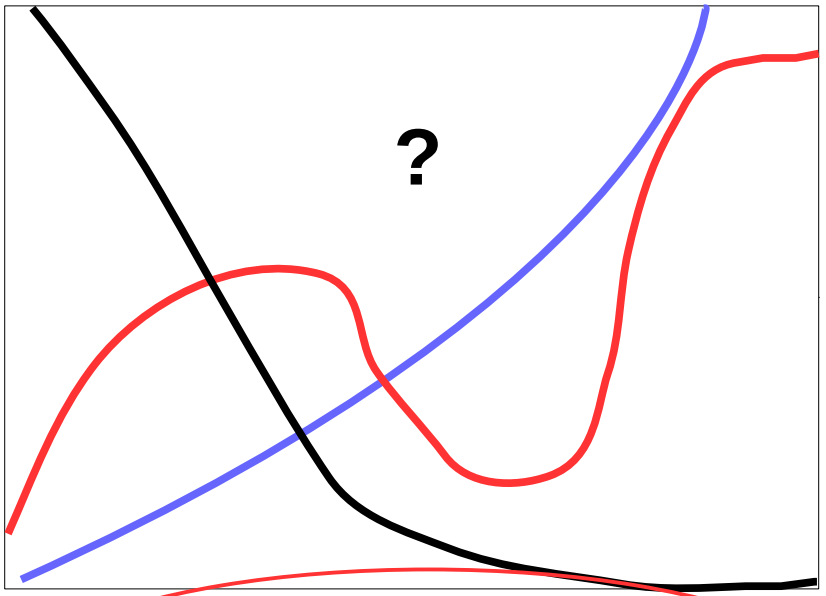






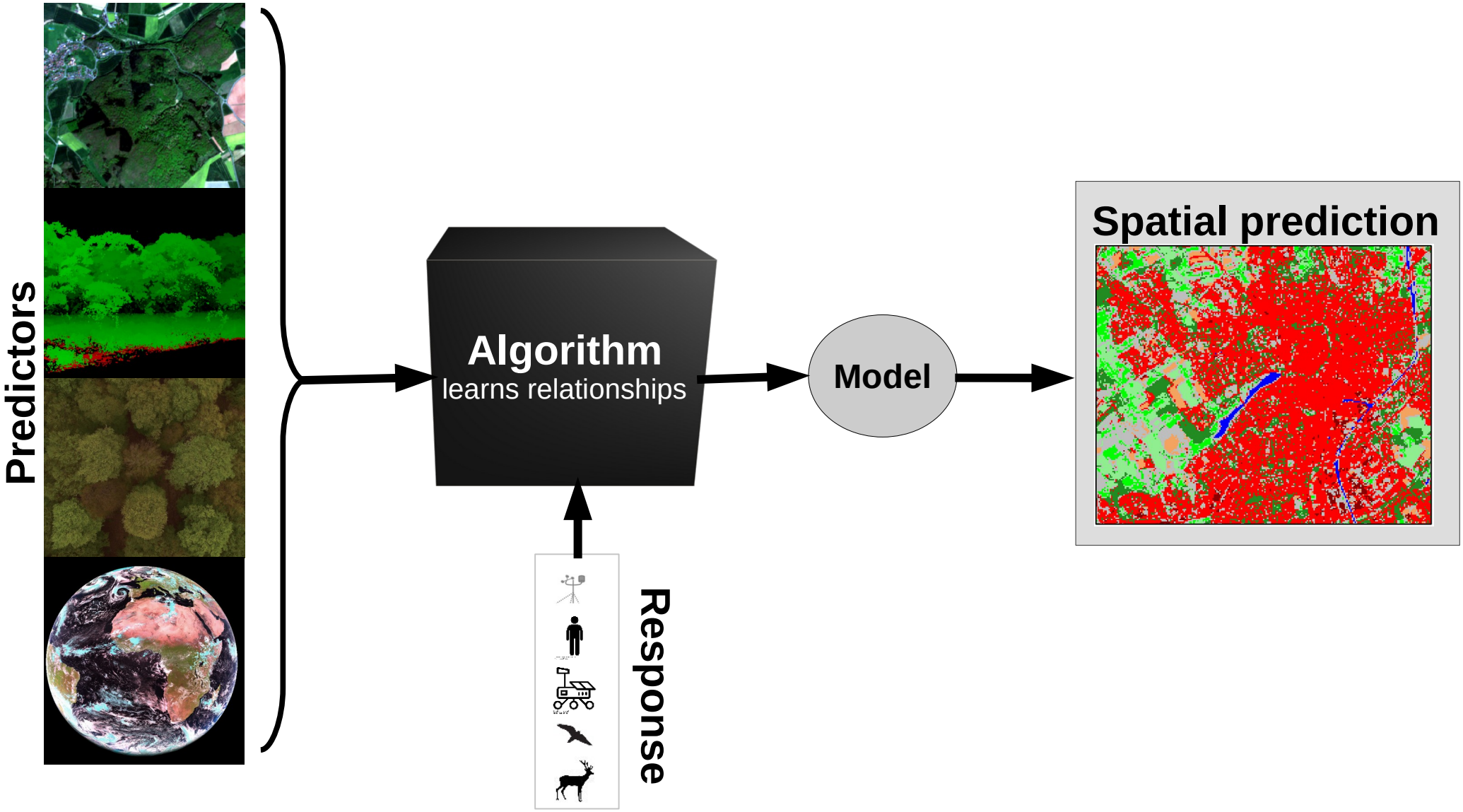
...but what about more complex variables?

Typical ecological variables from satellite?



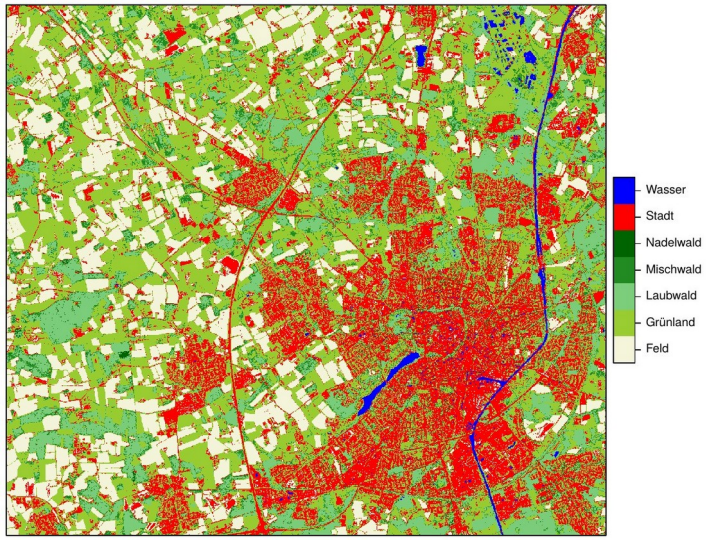
Models that can deal with complex nonlinear relationships are required!

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

Course material:
/github.com/HannaMeyer/lfsd_Poznan23