

Internship summary

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Between 31/10/2022 and 13/1/2023 I conducted an internship at the department of Physical Geography and Ecosystem Science at Lund University, supervised by researcher Per-Ola Olsson.

The aim of the internship was to investigate how spruce bark beetle outbreaks affect the local variability of satellite retrieved vegetation indices, in particular NDVI, CCI, NDRS, and NDWI. The coefficient of variation within quadratic grids of high-resolution pixels was used to indicate the variability of the vegetation indices. The results were to be used to help set and justify parameters in a newly developed machine learning model for bark beetle outbreak detection.

Practically, I developed Python code for the project from start to finish. The study area was in southern Sweden. Most of the data was pre-processed and available to be used directly, even if I needed to conduct some minor GIS operations on some of it.

First, I identified suitable grids of pixels to be analysed based on a set of conditions regarding bark beetle damage status and land cover. Once the grids were identified, I calculated the coefficient of variation for each grid and for each date with data. The resulting datasets were then analysed based on grid size, land cover, and bark beetle attack intensity. The internship was concluded by writing a report. I met my supervisor regularly throughout the period, discussing the latest results, technical issues, and how to proceed.

Throughout the internship, I developed skills for project planning, defining workflows, processing large datasets, developing Python scripts within the context of geospatial analysis, as well as analysing, visualizing, and presenting data. The internship also increased my theoretical understanding of remote sensing and geospatial analysis as well as the impact of bark beetles on the spectral properties of forests.

Overall, the internship was an enriching insight into academic research and the experience will be highly relevant in future studies and work.