

## Thesis Reviewer's Report

Student: Emmanuel Amponsem  
 Title: ASSESSING VEGETATION CHANGE USING SATELLITE IMAGERY ANALYSIS  
 Supervisor: Ing. Tomáš BRUNCLÍK, Ph.D.  
 Reviewer: Ing. Jakub JECH, Ph.D.  
 Reviewer's job title: Assistant Professors, Institute of System Engineering and Informatics, University of Pardubice

### Assessment criteria

	excellent	very good	acceptable	unacceptable	N/A
Achievement of the aims of the thesis	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use of appropriate methods	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Depth of analysis (in relation to the topic)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Structure and extent of the thesis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use of Czech and foreign sources (including references)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Formal aspects (text, diagrams, charts)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of language (style, grammar, terminology)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Usability of the results

	high	medium	low	N/A
In theory	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In practice	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### Other comments

The aim of this thesis is to compare selected methods of satellite vegetation delineation or change detection and use the chosen method to assess vegetation change in recent years in a selected area of interest. I can state that the objective according to the assignment was fulfilled, but this is an occasional fulfillment of the objective. The student carried out a quality literature search in the field of remote sensing and especially in the field of environmental monitoring. I also positively evaluate the analysis in the field of spectral indices, but it would be appropriate to add formulas for individual indices. The data processing using Google Earth Engine was imaginative, where the student carried out programming.

I consider the use of two different types of data, one including corrections, the other not, to be not entirely appropriate. This use certainly brings greater differences in data processing. Similarly, Figure 3 with the title "RGB Composites" certainly does not show the RGB composition of bands or lacks the definition of which band corresponds to which data from satellite bands. Since the student worked with spatial data, I evaluate the interpretation of data and results very negatively, where the scale is always missing and screenshots from the screen are often used to present spatial information. The actual execution of the practical part of the work is well systematized, but the interpretation of the results would like to improve, according to cartographic requirements. It would be appropriate to reorganize the interpretation of the results using tables. Figure 13 does not correspond to the legend. For the selected random forest method, there is no example of training data and class balancing, only

the result is shown. I evaluate the display of the results of the confusion matrix very negatively, in which only 4 classes are displayed instead of the processed 5 and, moreover, it is poorly trimmed to 4 classes. The achieved results of the Kappa coefficient cannot correspond to the tables mentioned, this can also be seen from the results in the appendix.

The objective of the work was achieved, although occasionally, and therefore I recommend the work for defense, but I rate it very poorly.

### **Questions and suggestions for the defence**

1. Why did you decide to combine NDVI and EVI indices, and in what cases did one of these indices fail or not provide enough information?
2. Have you considered using other vegetation indices?
3. Why was the comparison of spectral indices performed against supervised classification and why was the random forest method chosen?
4. Have you considered using other classification methods, perhaps based on deep learning?

### **Overall evaluation**

I **recommend** the thesis for defence.

The proposed grade for the thesis: E

In Pardubice on 19.5.2025

Signature .....