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Author: Mr. Ahmed Farid
Telespazio VEGA Deutschland GmbH, Germany, ahmed.farid@dlr.de

Mr. Mostafa Elfouly
Germany, fouly@premium-methods.com

Ms. Imane El Khantouti
Space Generation Advisory Council (SGAC), Morocco, imane.elkhantouti@spacegeneration.org

APPLYING GEOGRAPHIC INFORMATION SYSTEMS FOR MONITORING OF BLOOM
DYNAMICS FROM SPACE PART TWO

Abstract

In the last research paper (part1) at IAC 2020 with paper code IAC-20,B5,1,3,x58299, we have addressed the crucial challenges that we are facing in the water scarcity and the formation of blooms. We demonstrated the conceptual part of how can a Geographical Information Systems (GIS) based framework be used as an early warning system for detecting cyanobacteria's damage before it takes place. Furthermore, Indicator Modelling Framework (IMF) based on Model-driven Engineering (MDE) allows for comparability between different geodata providers and can be used for validation purposes.

In this paper (part 2) and the final part, we are demonstrating the GIS solution that would assist in visualization of blooms rich areas causing cyanobacteria to be formed, while there exist different factors that play a role in the formation of blooms such as ecosystem disturbance. In addition, it will aid in the identification of vulnerable areas, as well as compute the impact of the formation of such bacteria on health and the economy sector. This, in turn, enables us to apply impact assessment and raise awareness about the danger of the algae formation. In order to apply these methodologies and assess how drastically people are being affected by cyanobacteria, sufficient data has to be provided by the geodata-providers or data-modelers, such as municipalities. Per mentioned earlier in the predecessor paper, this enables for geo-statistical analysis of the potential affected areas.

Moreover, in this paper, we aim at visualizing these affected areas and demonstrate which lakes are at risk of forming blooms. Furthermore, we shed a light on the estimated affected population that are at risk of contacting these bacteria. Afterwards, we are applying the geo-statistical analysis to generate dashboards and implement the impact assessment framework that has been demonstrated in Paper 1. Thus, it will facilitate elaboration on how to tackle the issue that is affecting the people living nearby and our ecosystem. Additionally, it will bring together the data that are stored in files and visualize them to the decision makers and authorities.