



Cyprus
University of
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Faculty of Environmental
Science and Technology

Master's Thesis

**Understanding the Main Drivers of Harmful Cyanobacterial
Blooms by Developing the European Multi Lake survey
platform Datasets**

Iosif Konstantinou

Limassol, June 2019

CYPRUS UNIVERSITY OF TECHNOLOGY
FACULTY of Environmental Science and Technology

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Approval Form

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Limassol, May, 2019

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ABSTRACT

During 2015 a pan-European multi-lake survey (EMLS) took place in 28 European countries, where 380 lakes were snapshot sampled for numerous biological, chemical, and physical parameters, in order to achieve a uniform dataset. This aid the scientific community to gain a more in-depth understanding of how the two major drivers of harmful cyanobacterial blooms, interact with temperature and nutrients. This initiative follows the UN Sustainable Development Goals focus on establishing national, open data policies in order to ensure easier access to traditional knowledge, citizen science, big data, and communities of practice. The EMLS pursue further this goal by creating a data platform with open access to any of the survey data and derived products which was the main goal of this thesis.

The reason for creating the European Multi-Lake Survey (EMLS) datasets platform was to improve the communication between scientists and competence authorities. This was achieved through an open-science perspective where datasets are being uploaded, managed, and achieved in a geospatial manner to provide the appropriate information.

A file transfer protocol (FTP) server was required to be set that would serve as an online repository for the data. Additionally, a webform page was also set up prior to the FTP server to make accessibility easier. After the successful set up of the webpage, the FTP server was set and all the files were uploaded. An extract transform load (ETL) tool was incorporated in order to extract the data from all the potentially heterogeneous Excel files (metadata files), transform them into the proper format and load them back in to the repository. The transformed metadata files were used in quantum geographical system (QGIS) to create the data layers, and then loaded into the GeoNode platform in order to visualize the data in the form of choropleth maps.

During this master thesis, an online repository was developed to initiate the development of the EMLS datasets platform as a webpage in a hosting space to give easy access to the online repository. Users of the survey can also access the online repository from an FTP server. The ETL Tool was considered in order to transform the potentially heterogeneous Excel files into a proper format but because of technical difficulties, it was not possible to finish the transformation work. Therefore, it is suggested that ETL may be further developed in future studies as it would be proven a

useful especially when handle heterogeneous metadata sets. As an alternative, a common file was used as an example of homogenous metadata file to create the layers from the QGIS program, and finally uploaded them to GeoNode platform were created the choropleth maps. By creating these maps, the trends and tendencies of the different parameters that were measured (both physical and chemical) are easier to follow.

Keywords: EMLS, cyanobacterial blooms, metadata files, data layers, choropleth maps