DATA MANAGEMENT SYSTEM OF THE UNECE ICP Vegetation Program

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Mobile application

moss.jinr.ru

Prediction

Soogle Earth Engine

NDSA

MODIS

INTRODUCTION

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Air pollution has a significant negative impact on various components of ecosystems, human health and ultimately causes significant economic damage. Air pollution is the fourth largest threat to human health, behind high blood pressure, dietary risks and smoking.

The aim of the UNECE International Cooperative Program (ICP) Vegetation in the framework of the United Nations Convention on Long-Range Transboundary Air Pollution (CLRTAP) is to identify main polluted areas of Europe, produce regional maps and further develop the understanding of long-range transboundary pollution. The program is realized in 39 countries of Europe and Asia. Mosses are collected at thousands of sites. The Data Management System (DMS) of the UNECE ICP Vegetation consists of a set of interconnected services and tools deployed and hosted at the Joint Institute for Nuclear Research (JINR) cloud infrastructure. DMS is intended to provide its participants with a modern unified system of collecting, analyzing and processing of biological monitoring data.

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OpenLayers

php

mongoDB

Web portal

AGAX

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n python

NGINX

ARCHITECTURE OF MOSS.JINR.RU

A mobile application allows filling the required by the ICP Vegetation manual fields at sampling sites. The application automatically sets longitude and latitude of the sampling site, controls correctness of the input information and allows taking photos of the samples. The application is integrated with DMS (moss.jinr.ru), and all information about sampling sites can be imported to DMS.

The portal allows multi-level access to data and has advanced data processing and reporting mechanisms. There are two parts of the portal – public and private ones. General information about the project and the platform is presented in the public part. The private part can be accessed only by authorized contributors and is used for data management and analysis.

Contributors can manage their sampling, inter-laboratory comparison and POP data in the DMS private part. Data can be imported from and exported to Excel files. The verification of the imported data is done automatically and allows one to find most of human made mistakes. Participants can get some statistic parameters of their data, the correlation between element concentration, contamination factors, geo-indexes, etc.

NEW REPORTS



Advanced map creation mechanism and export to Google Earth

PREDICTION

Prediction is an important step of data analysis in any ecological survey. We try to use satellite imagery data and the artificial neural network to predict concentration. The general idea is to use data which we can get from satellite images together with sampling data from DMS to learn NN and then use only data from satellite images to predict concentration.



U for Romania



LATEST PUBLICATIONS



A. Uzhinskiy, G. Ososkov, P. Goncharov, M. Frontsyeva. Combining satellite imagery and machine learning to predict atmospheric heavy metal contamination, CEUR Workshop Proceedings, Vol-2267, ISSN 1613-0073, pp. 351-358, 2018



A. Uzhinskiy, G. Ososkov, M. Frontsyeva. Managing data of the environment monitoring. Open systems. DBMS, Nº4 2017, pp. 42-43, ISSN 1028-7493, in Russian

Fe historical trend report

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