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Combining satellite imagery and machine learning to predict atmospheric heavy metal contamination

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We present an approach to predict atmospheric heavy metals contamination by statistical models and machine learning algorithms. The source of the field contamination data is ICP Vegetation Data Management System (DMS). DMS is a cloud platform developed at the Joint Institute of Nuclear Research (JINR) to manage ICP Vegetation data. 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 the main polluted areas of Europe and Asia. Currently there are 6000 sampling sites from 40 regions of different countries presented at the DMS now. The source of the satellite imagery is Google Earth Engine platform (GEE). There are more than 100 satellite programs and modeled datasets at GEE. We are taking data from GEE together with sampling data from DMS to train our deep neural models, but then on the next inference stage we apply the trained neural net to only data from GEE to predict atmospheric contamination by some of heavy metals.

Correlation between the satellite imagery data and the heavy metals contamination, considered statistical models and modeling results are presented.

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