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Using Remote Sensing Technologies to Improve Climate Literacy of Students at the Junior Academy of Sciences of Ukraine

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The Junior Academy of Sciences of Ukraine (JASU) is a state-funded extracurricular educational system that develops and implements methods of science education. Climate education is an essential component of educational system at the JASU. Currently, the JASU has more than 250,000 students working in 64 scientific areas. In 2018, the Junior Academy of Sciences of Ukraine received the status of Category 2 Science Education Center under the auspices of UNESCO and joined the network of Copernicus Academies.

In 2012, a new section, Geographic Information Systems (GIS) and Remote Sensing of the Earth (RS), was established at the Kyiv branch of the JASU, which is supervised by the GIS and RS Laboratory. Whereas the Fourth Industrial Revolution is characterized by a booming growth of IT and unprecedented environmental problems and climate changes, the Junior Academy of Sciences of Ukraine aims not only to prepare modern students for life in new environment, but also to improve their climate literacy. Therefore, the GIS and RS Laboratory set a goal to teach the students to utilize modern technologies for monitoring environmental conditions of a particular area through analysis of satellite imagery within the framework of the All-Ukrainian Competition, “Ecopohliad” (Ecoview) (hereinafter referred to as the “Competition”).

Every day we receive arrays of spatial data that are published on the Internet. However, without proper analysis and, most importantly, interpretation, such data are deposits of rough diamonds hiding in rock formations. Knowledge of the sources and ways to analyse satellite imagery enables us to independently verify the information provided by the media or official statistics. In its activities, the Laboratory uses extensively cloud services, EO Browser and Giovanni, which are characterized by intuitive interface and large array of available satellite imagery.

The Competition was held for the first time in 2019-2020. It was attended by 341 secondary school students. Topics of competition projects chosen by the students were mostly related to the climate change at their places of residence. In particular, Artem Shelestov examined the relationship between the area of greenery in Kyiv city using Sentinel-2 satellite images and average annual air concentration of PM 2.5 based on surveillance sensors data. Bohdan Avramenko examined the traffic load on the air in the city of Starobilsk, compared the data with the information from Sentinel-5P satellite, and developed appropriate recommendations. Marharyta Korol analysed the scale and consequences of the fire that occurred in September 2019 in the village of Novi Sokoly near the Chornobyl Nuclear Power Plant, and the impact of this emergency situation on air pollution.

These studies were not only of scientific interest, but also of practical importance. In particular, the results of investigations conducted by Competition winners were published in the media.