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Remote sensing as a tool for science education and engagement: the case of the All-Ukrainian competition "Ecoview"

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The war in Ukraine has harmed all areas of public life. Educational institutions have had to adapt to restrictions and threats to ensure the safety and accessibility of education in challenging conditions, working to restore children's inalienable right to access knowledge. The Junior Academy of Sciences of Ukraine (JASU) is the largest Ukrainian out-of-school organisation, with over 200,000 students annually, which supports the development of science education in regions. It is also a Category 2 Centre under the auspices of UNESCO and the first organisation in Ukraine to join the Copernicus Academy network.

The All-Ukrainian Competition "Ecoview" has been organised annually since 2019 by the GIS and Remote Sensing Laboratory of the JASU. The Competition aims to promote science education and improve students' climate literacy and environmental awareness. Using remote sensing data is the main requirement for participation.

Between 2021 and 2023, over 1000 students of all ages from different regions of Ukraine registered to take part in the Competition. Participants commonly chose topics related to climate change, air pollution, deforestation, land cover change, and urbanisation. Since 2022, there has been an increase in the number of projects dedicated to studying the war effects on the environment in Ukraine. The study focused on various aspects including the destruction of settlement infrastructure, the impact of hostilities on nature reserves, and the pollution of the Black Sea caused by the sunken cruiser „Moskva". The participants most commonly used open satellite monitoring data as sources of information for their research, processing them using NASA Giovanni, EO Browser, Google Earth, QGIS, etc.

Results of the entrance survey, conducted during registration, show a notable boost in participants' awareness of remote sensing, enhanced critical thinking, and improved ability to work with primary sources. Thus, when asked about their experience with satellite imagery, 9.5% of the total number of respondents answered in the affirmative in 2021, 19.7% in 2022 and 22.5% in 2023. Furthermore, the survey results show that an increasing number of participants are consistently fact-checking information published in the media or on the Internet (72.6% in 2021, 74.8% in 2022 and 85% in 2023). Knowledge of satellite imagery sources and analysis methods enables students to independently verify expert opinions and media-provided information, which contributes to the development of media literacy.

The results of the annual competition are inevitably covered in the media and on social networks. To assist potential participants in selecting their own project topic and research tools, a specialised video course titled „Ecoview: Satellite Data in Nature Research" has been developed. This course is available for public access on the GIS and Remote Sensing Laboratory`s YouTube channel (https://www.youtube.com/playlist?list=PLbqB1gQogHvsyFDiOO0y6EVAVdjQnveDI).

Based on the experience and results of the Competition "Ecoview" in Ukraine, it will be organised internationally in 2024. The event is aimed to establish relationships between participants from different countries and to create an international community of like-minded people interested in using remote sensing for environmental research and protection.