Institute of Agroecology and Natural Resource Use of the National Academy of Agrarian Sciences of Ukraine
Laboratory of Aerospace Remote Sensing of Agrosphere

IMPACT OF THE DESTRUCTION OF THE KAKHOVKA RESERVOIR ON AGROECOSYSTEMS IN THE STEPPE ZONE BASED ON SATELLITE DATA

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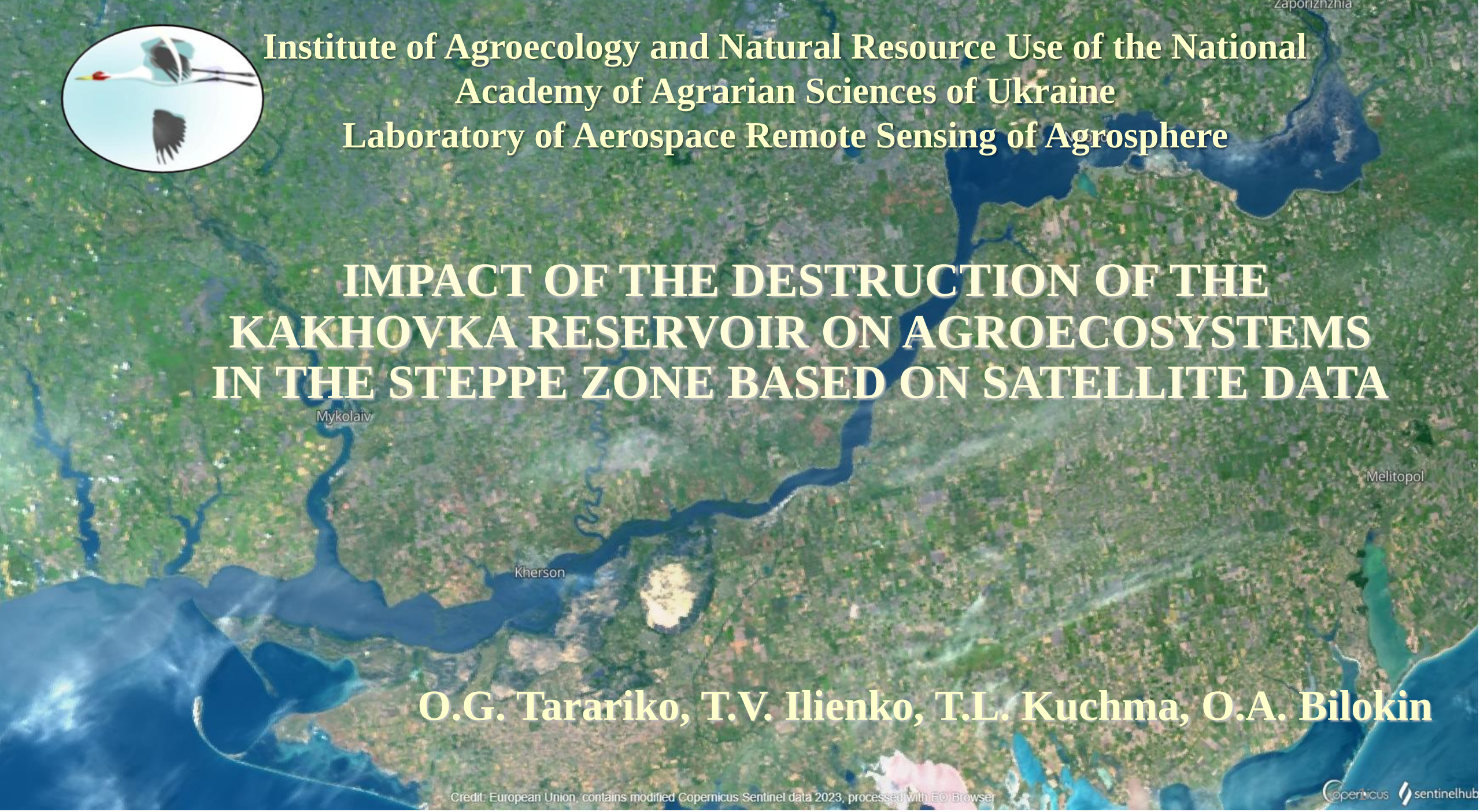
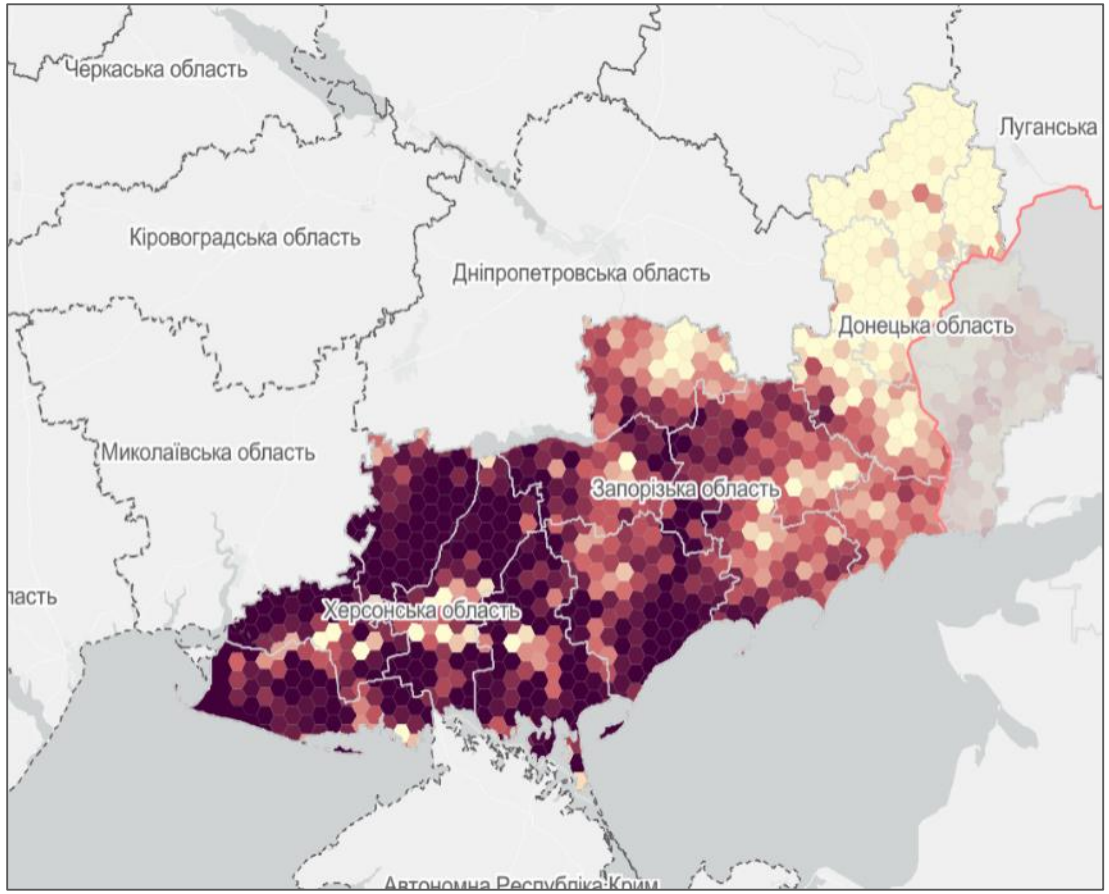


Ukraine as a Global Critical Agrosphere for World Food Security

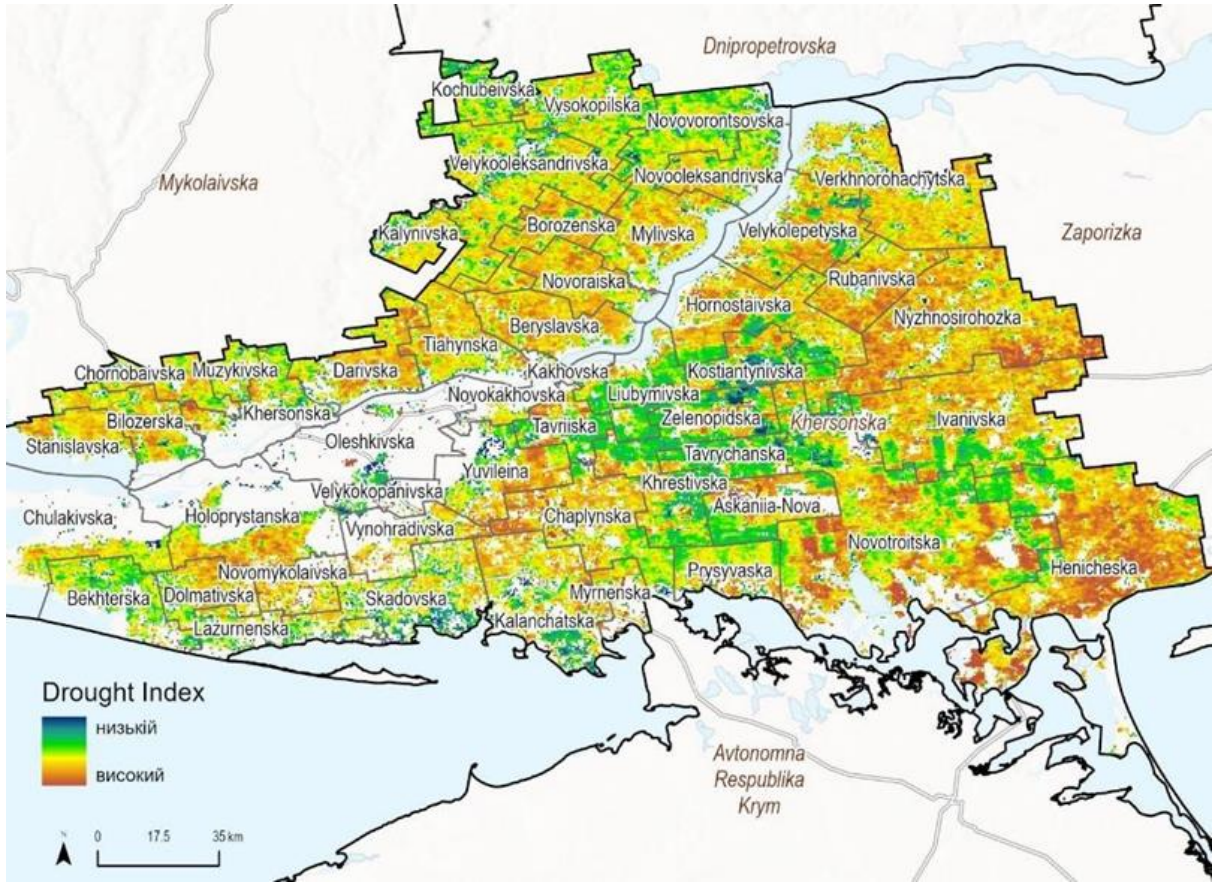
The rapid climate warming and military activities, including Russian aggression, are increasing the risks to global food security. Throughout the evolution of civilization for thousands of years, the development of agriculture and, consequently, food security, has been mainly concentrated in the mid-latitudes of the Earth due to moderate climate and fertile soils.

Ukraine's territory is located in the center of mid-latitudes and the world's black soil belt. Considering its agro-resource potential, Ukraine represents an agrosphere with a high potential for food production. Therefore, from this perspective, Ukraine's agrosphere can be regarded as a critical reference point for global food security on the world map.

Frequency of Drought Events in the Pryazovian Region



The frequency of drought events in the Pryazovian region is represented by the Vegetation Condition Index (VCI), where higher values are indicated by dark colors.



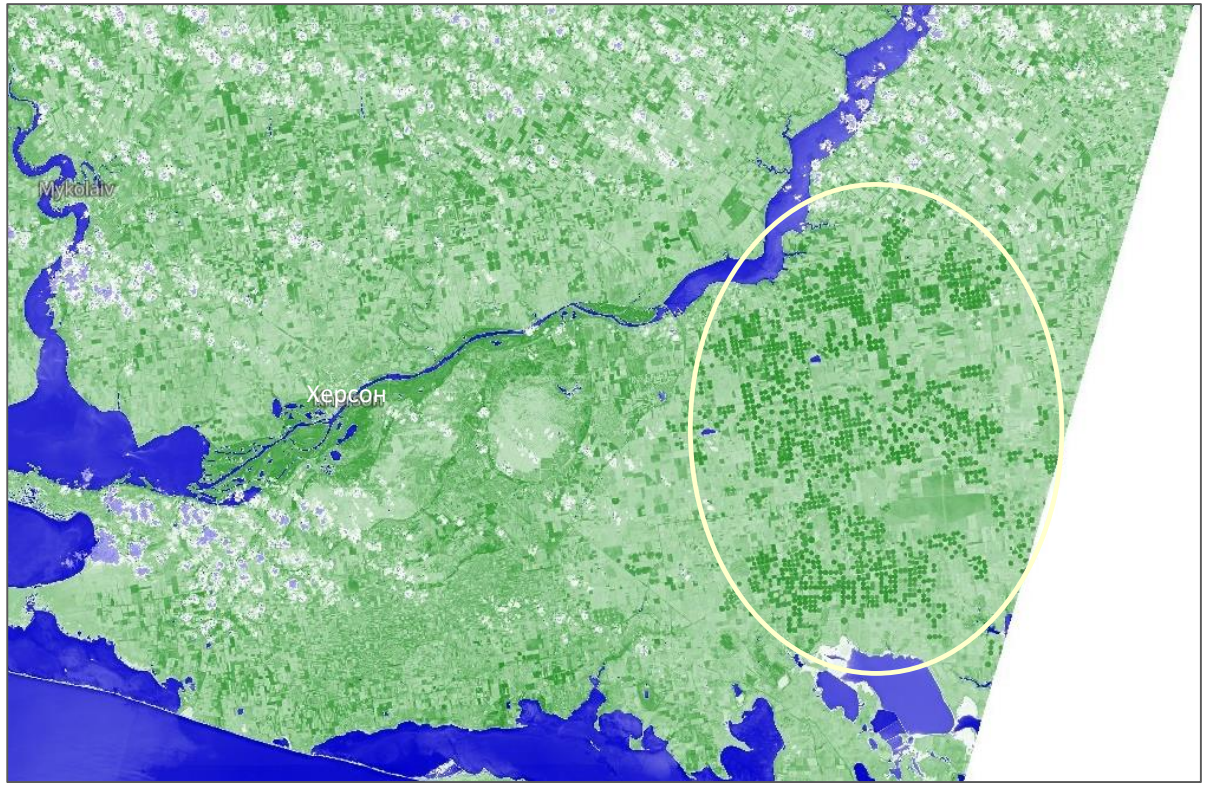
The frequency of drought conditions in Kherson Oblast is represented by the drought index.

Drying of the Kakhovka Reservoir (Sentinel-1)

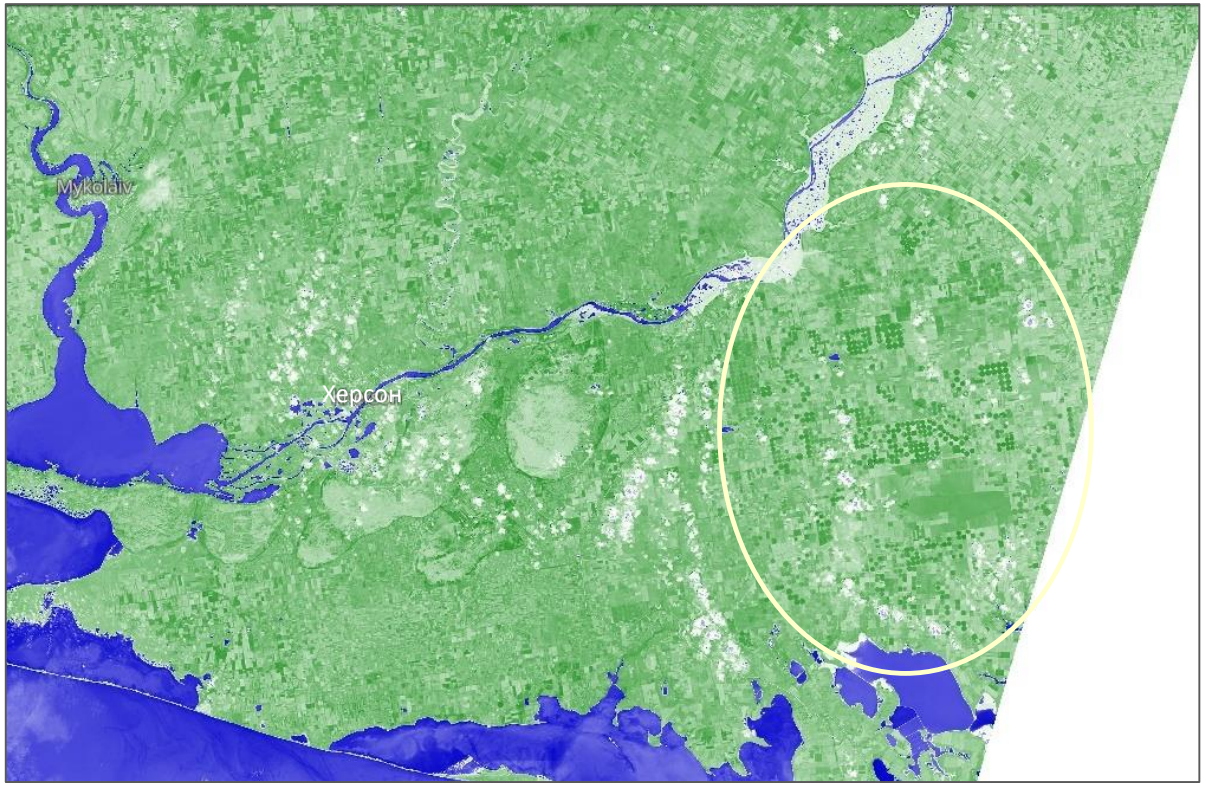
The dynamics of the water surface area based on satellite imagery (Sentinel-3)

Water index NDWI

Sentinel-2, 3.07.2020



Sentinel-2, 3.07.2023



Nationally Protected Areas Affected by the Destruction of Kakhovka Reservoir (Based on Satellite Data)

Nationally Protected Areas	Squre
Total 23:	55909 ha
National Nature Park of State Importance "Nyzhnedniprovsky"	52000 ha
Three state-level reserves: *State Hydrological Reserve "Lake Solyane"* *State Landscape Reserve "Stanislavsky"* *State Forest Reserve "Bakaysky"*	774 ha
Local Importance Nature Conservation Objects: *6 reserves,* *1 nature monument,* *9 natural landmarks,* *2 park-monuments of garden and park art,* *1 regional landscape park "Vysunsko-Inhuletsky"*	More than 3000 ha

Proposals

1. In the flooded areas, it is necessary to assess the level of biological, chemical, oil, and military contamination of agricultural lands. A separate decision should be made for each land user regarding the appropriateness of using the land for its intended purpose.

2. Landowners who wish to restore agricultural activities must obtain a certificate of satisfactory land quality.

3. Measures should be developed and implemented to limit the spread of invasive vegetation on the areas cleared of water.

4. Identify land plots unsuitable for further targeted use of flooded arable lands and convert them into natural habitats.

5. It may be advisable to consider the option of temporarily conserving the entire flooded zone and establishing a reserve on this territory similar to the Chernobyl Exclusion Zone.

Thank you for attention