

# Experience in studying spontaneous restoration of wetlands at the site of the former Kakhovka Reservoir

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# Analysis of the Diverse Consequences of the Kakhovka Dam Destruction and Subsequent Environmental Changes.

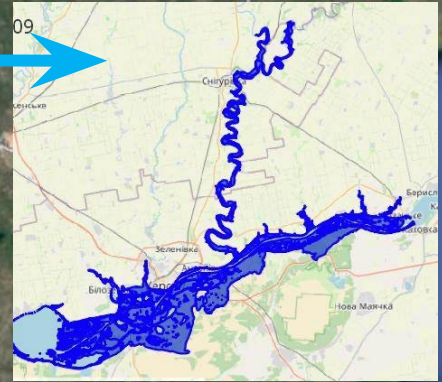
Zone of Drying  
(Desiccation)

Zone of Catastrophic Flooding

Скадовськ

612 km<sup>2</sup>

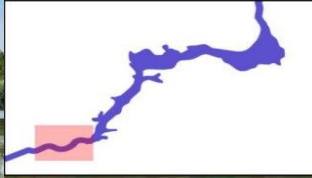
## Zone of Marine Pollution



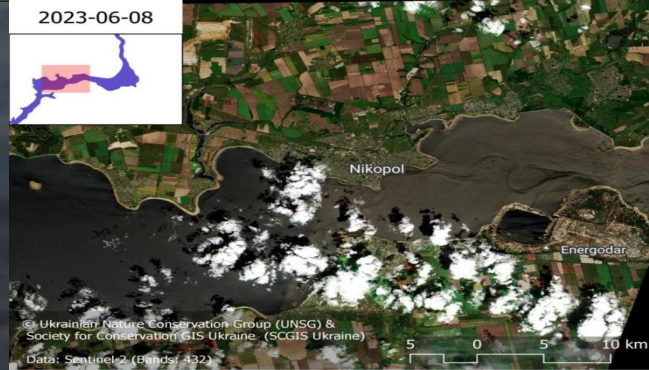




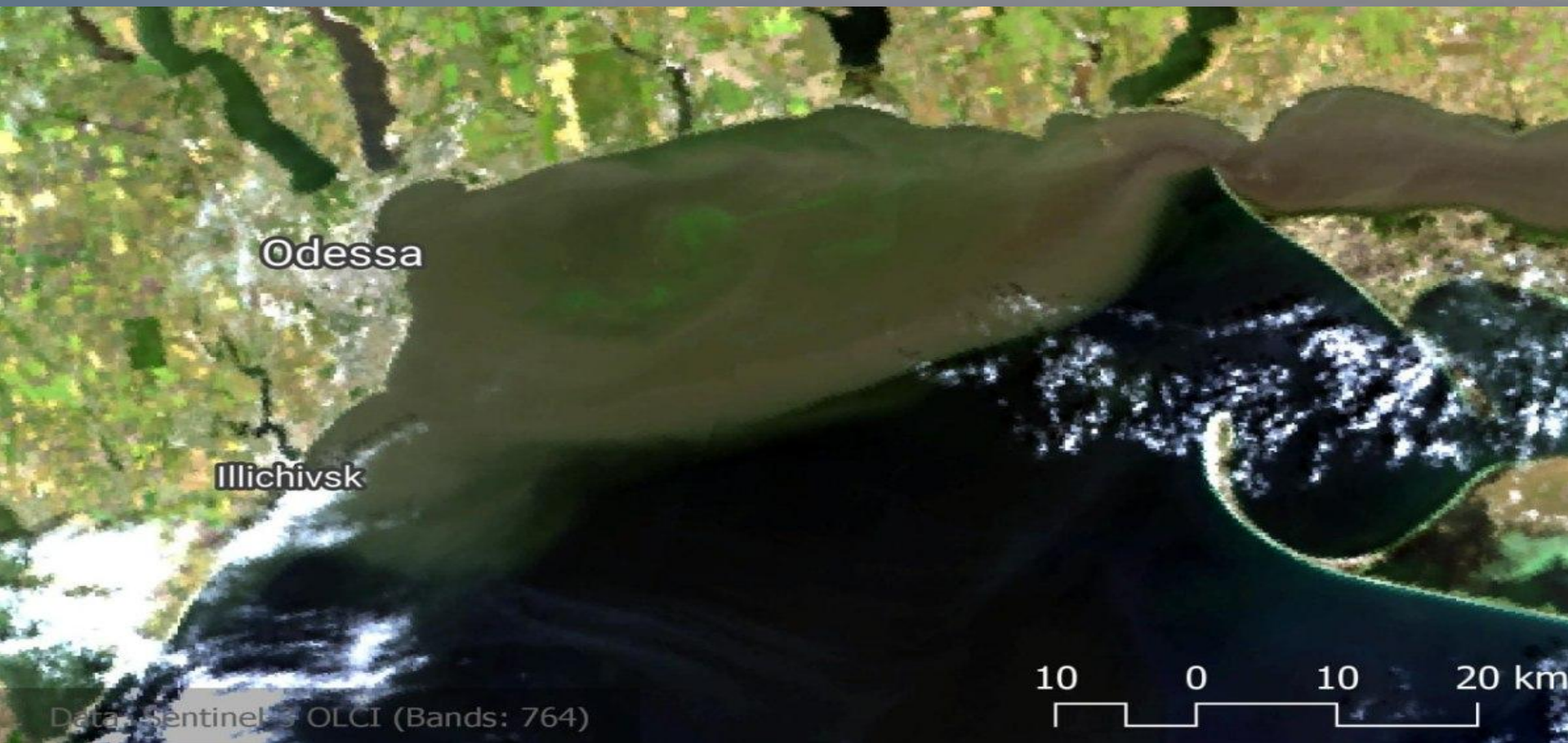
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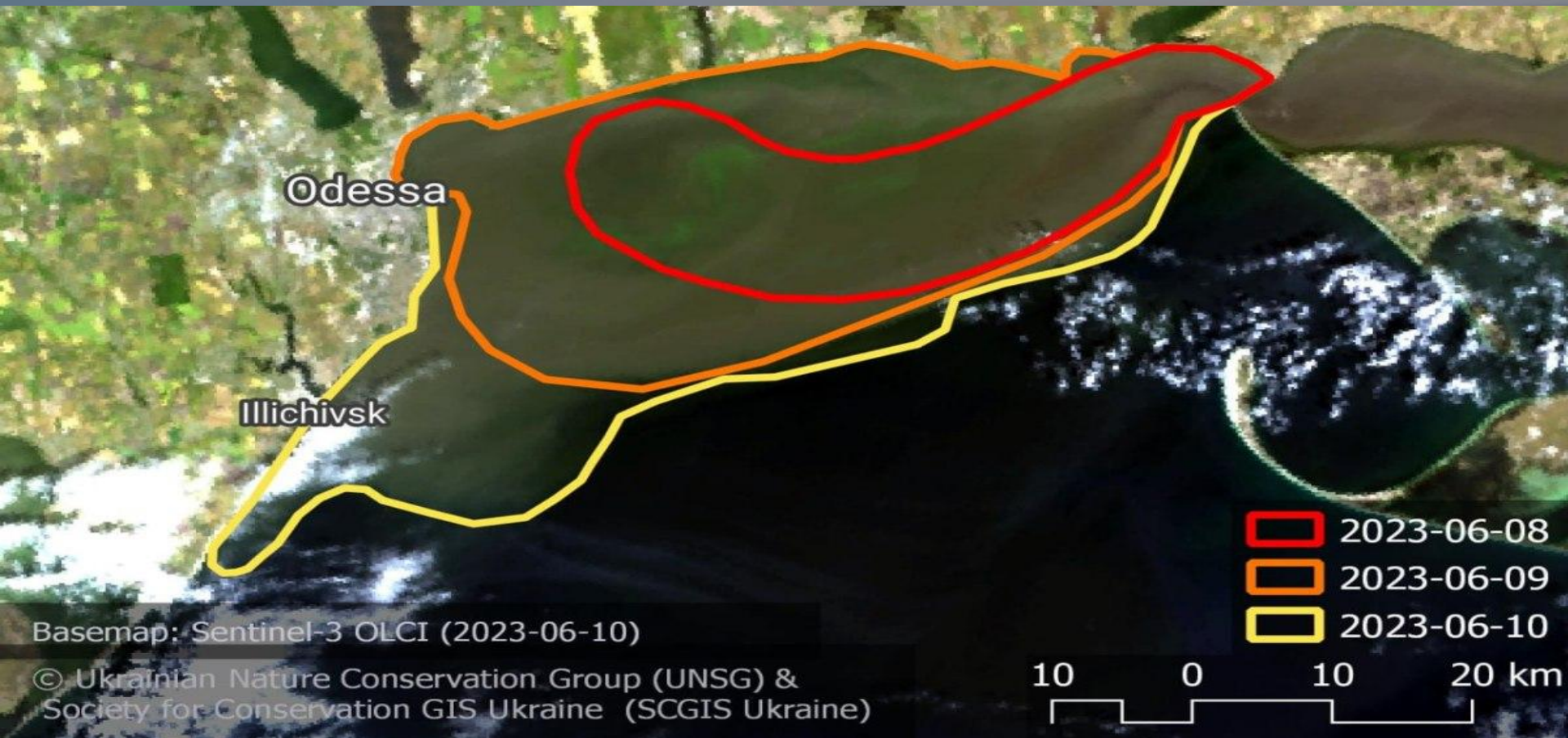


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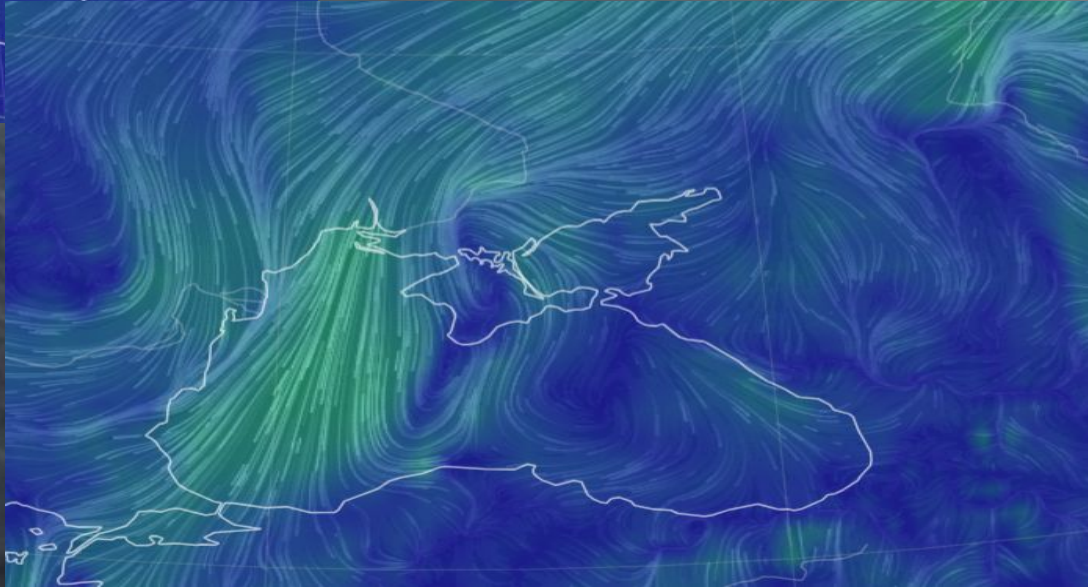
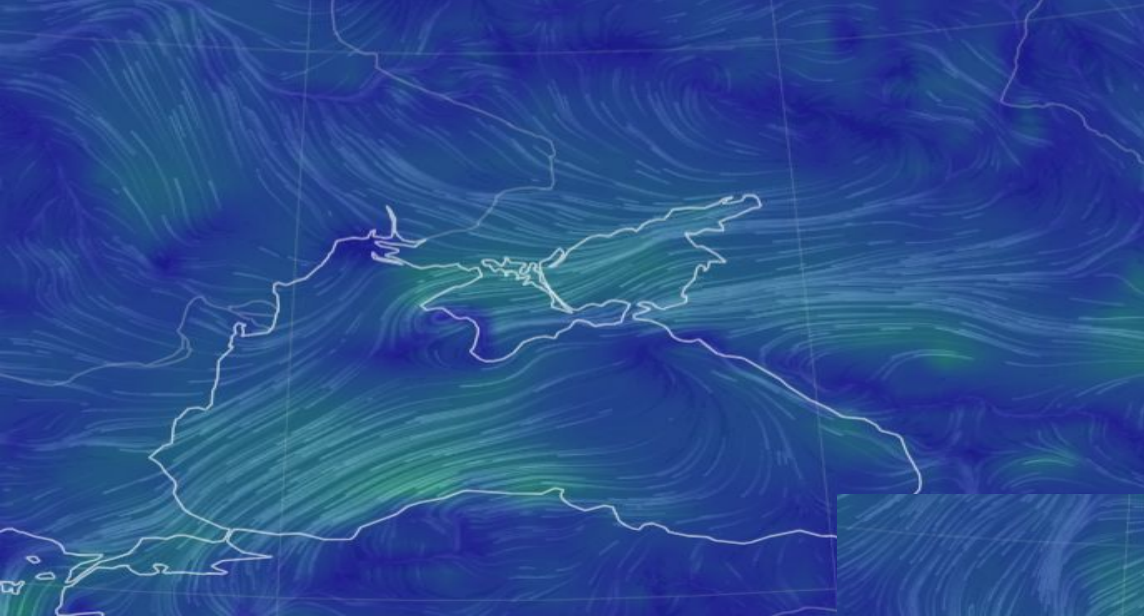


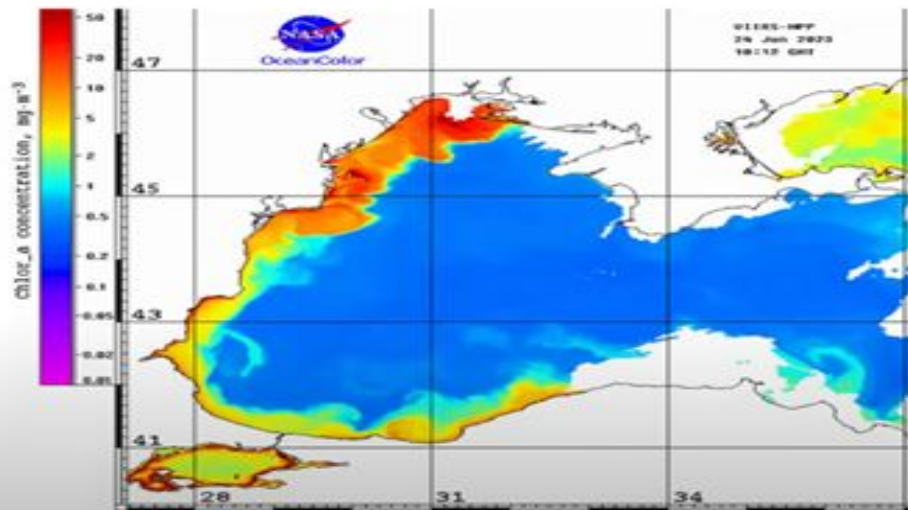




















## **“RECOVERY” AFTER THE EXPLOSION**

*What exactly needs to be restored?*

**The company “Ukrhydroenergo”, which owns the Kakhovka Dam along with five other dams upstream, considers only one future scenario — the construction of a new, larger hydroelectric power plant.**

It is actively mobilizing support from European corporations and development banks.

**The Russian occupation authorities on the left bank of the Dnipro also insist on the rapid restoration of the dam**

in order to ensure water supply to the occupied Crimea...

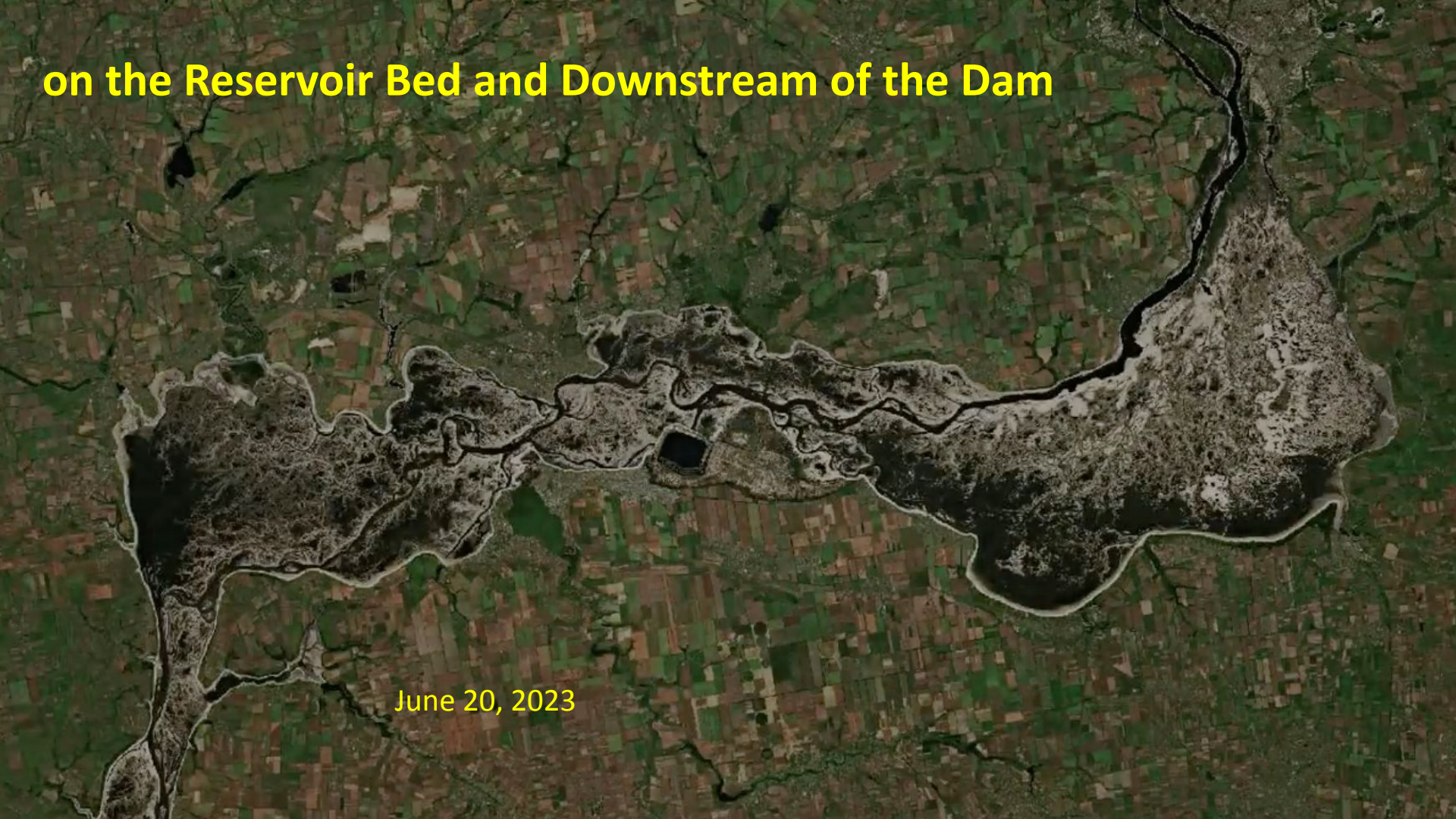
**The Government of Ukraine, which currently controls the Right Bank, has made three decisions so far:**

- To develop an engineering project for the future reconstruction of the dam after the war using public funds;
  - To design and build new water supply systems for each city, independent of the Kakhovka Dam;
  - To prohibit the transfer of reservoir bottom lands for other purposes (such as agriculture) for 15 years.
- Additionally, the Ukrainian Parliament is working on a new law** to ensure protection of nature reserves in that area.



**on the Reservoir Bed and Downstream of the Dam**

**June 20, 2023**



## **“Build Back Better” (a compromise with the dam)**

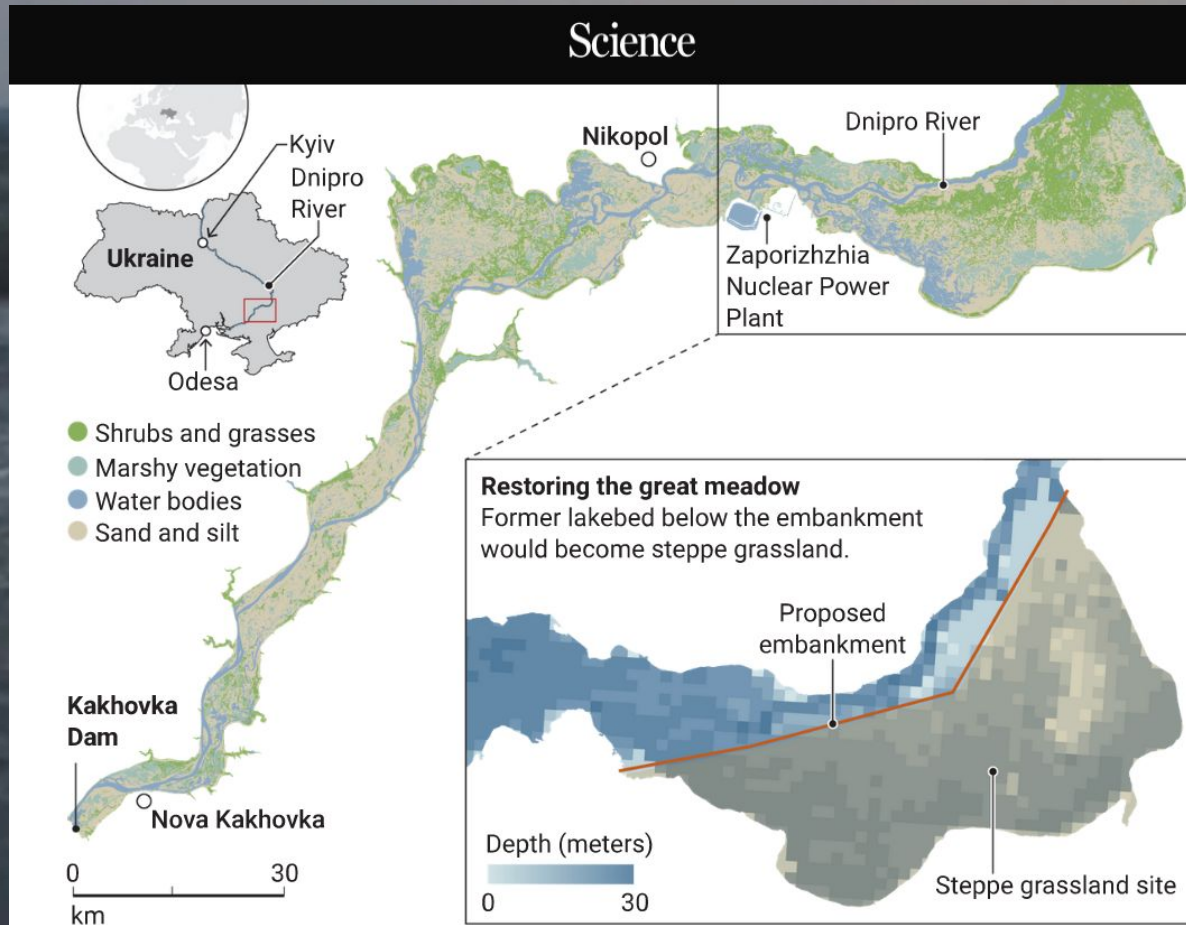
**Many agencies and interest groups have proposed different visions of what should be “restored” in place of the Kakhovka Reservoir.**

Such experts often advocate for more “efficient” use of land and water resources, rather than for nature conservation.

For example, there is a proposal to divide the deep and shallow parts of the former reservoir with a dam — a plan disguised as “meadow restoration” that excludes the revival of the natural floodplain.

Other experts openly suggest building a similar dam to use the shallow area for fish farming or to drain it for agriculture.

*Map source: Laid to waste. Science. 5 Jan.2024  
DOI: [10.1126/science.adn7986](https://doi.org/10.1126/science.adn7986)*





## HOPES FOR A “NO-REGRET” RECOVERY

The ongoing war makes any immediate steps to restore the reservoir impossible. The most optimistic estimate for its reconstruction is “6–7 years after the war.” Meanwhile, urgent needs of the population and economy require fast and practical solutions.

Current development of alternative water supply systems and decentralized renewable energy (solar and wind) opens the door to modernizing infrastructure without reverting to an outdated model.

Under current conditions, creating a new reservoir is no longer a cure-all — it would require years of waiting and billions in investment. A more feasible scenario is the revival of the regional economy without a reservoir, which is already being funded by Ukraine and its international partners.

These trends, along with growing criticism of dam reconstruction plans, help society recognize that restoring the Lower Dnipro ecosystem offers a more sustainable and realistic alternative. After all, investing billions of euros in two mutually exclusive scenarios is not a sound strategy.





## IN SEARCH OF A RESTORATION BASELINE



We have analyzed data on biotope distribution before the flooding of the 2,000 km<sup>2</sup> area in the early 1950s:

- Woody and shrub vegetation: **20%**
- Wet meadows: **15%**
- Psammophytic (sand-loving) communities: **15%**
- Sand spits and ridges: **2%**
- Wetlands: **34%**
- Clay cliffs and rocky outcrops: **1%**
- Open water: **13%**



However, this distribution likely reflects the landscape during **1930–1959**, when Soviet collective farms began using heavy machinery for hay harvesting.







It is assumed that before the rise of industrial livestock farming and the use of floodplains for grazing and haymaking, forested areas covered most of the Dnipro floodplain.

Today, the ecosystem is actively recovering, with native tree species (mainly willows and poplars) dominating the regeneration. Under climate change conditions, floodplains may be the only places in southern Ukraine where large-scale restoration of natural forests is still possible.





The bottom of the Kakhovka Reservoir, three months apart: June 30 – October 19, 2023 (*Photo by O. Khodosovtsev*)



## MONITORING THE RECOVERY

Three weeks after the dam explosion, a team of geobotanists from UNCG established the first vegetation monitoring plots on the former reservoir bed.

Since then, they have conducted four research expeditions to the area.

Plant species diversity is increasing, while the share of invasive species (23% as of July 2023) is decreasing.

So far, it has not been possible to conduct full-scale animal studies.

However, in May 2023, the Fisheries Inspection recorded the return of migratory sturgeons to the upper part of the former reservoir.



Danube sturgeons caught by poachers upstream of the former Kakhovka Dam near Zaporizhzhia, May 2024.



Photo Olena Kravchenko



Photo Liubov Borsukevich



## HOW TO ENABLE FLOODING TO SUPPORT ECOSYSTEM HEALTH?



It's not only forests that are being revived — wetlands, beaches, sand dunes, and other habitats are also regenerating. However, all elements of the Lower Dnipro floodplain depend on a natural flow regime.

Since five dams upstream form the Dnipro Hydroelectric Cascade, this requires the design and coordination of ecological flow regimes.





## OPPORTUNITIES FOR EUROPEAN INTEGRATION

EU accession includes important environmental commitments. The Bern Convention on the Conservation of European Wildlife and Natural Habitats calls for increasing the total area of natural ecosystems to 30% of all land on the continent by 2030.

In Europe, the practical implementation of these goals is supported by the EU Nature Restoration Law, agreed on February 27, 2024.

According to this law, EU member states must introduce effective measures to restore nature, with the goal of jointly restoring at least 20% of land and 20% of marine areas by 2030, as well as reconnecting 25,000 kilometers of European rivers previously fragmented by dams.





# THE LARGEST FRESHWATER RESTORATION OPPORTUNITY IN EUROPE

**Restoring natural ecosystems along a 250-kilometer stretch of the Dnipro River could become the largest freshwater restoration project ever undertaken in Europe. It has the potential to become a decisive contribution by Ukraine toward fulfilling the EU's commitment to restore rivers to their natural state by 2030.**







Photo by Vincent Mundi, 2024