



2nd Meeting of the Joint Bycatch Working Group
Online, 5-6 February 2025



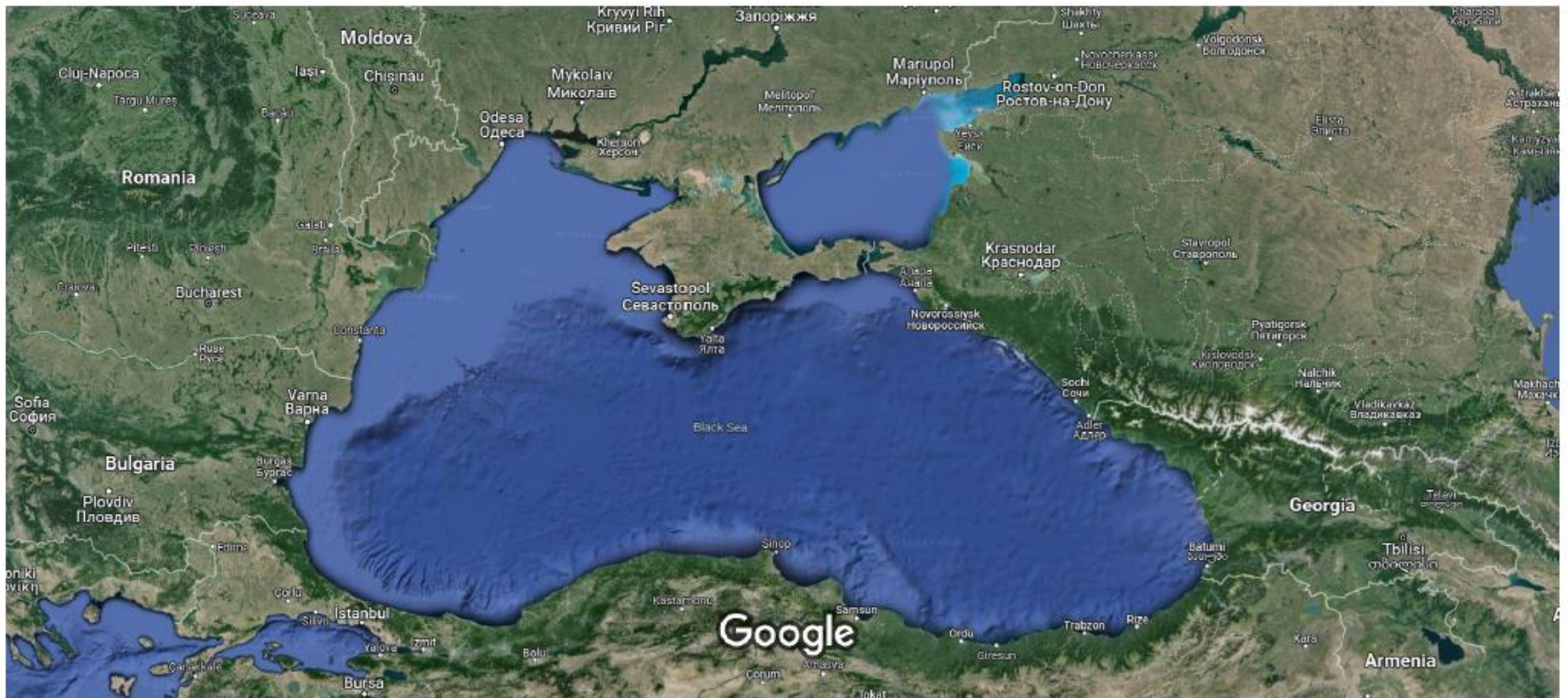
The war may increase bycatch risk

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The Black Sea

Google Maps



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Risks posed by military activities and their consequences

- Vessel movement and sonars
- Aircraft and other vehicles
- Blasts, missile launches
- Ruining of landscapes and seascapes
- Ruining of infrastructure facilities
- Wrecks
- Other technogenic disasters

Marine pollution

- Chemical (including oil and organic)
- Biological (bioinvasions and pathogens)
- Radioactive
- Noise
- **Mines**

Vessels, aircraft, sonars



Missile launches



Sea mines





Impacts of Navy Sonar on Whales and Dolphins: Now beyond a Smoking Gun?

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The risks military sonar poses to cetaceans received international attention with a highly-publicized mass stranding of Cuvier's beaked whales (*Ziphius cavirostris*), Blainville's beaked whales (*Mesoplodon densirostris*), and northern minke whales (*Balaenoptera acutorostrata*) in the Bahamas in 2000. This was the first time that the US Government determined a stranding to be the result of mid-frequency active sonar use. Subsequently attention has been drawn to other mass strandings coincident with naval exercises, including events preceding the 2000 mass stranding. The list of species for which mass strandings have been linked to naval exercises has also increased to include other beaked whales, dwarf and pygmy sperm whales (*Kogia* spp.), pilot whales (*Globicephala* spp.), several dolphin species (*Stenella* sp. and *Delphinus delphis*), and harbor porpoises (*Phocoena phocoena*). In particular, there have been several mass strandings in the northern Indian Ocean coincident with naval exercises—including one of the largest (200–250 dolphins)—which have received little attention. Changes in beaked whale behavior, including evasive maneuvering, have been recorded at received levels below <100 dB re 1 μ Pa (rms) and mass stranding may occur at received levels potentially as low as 150–170 dB re 1 μ Pa. There is strong scientific evidence to suggest that a wide range of whale, dolphin and porpoise species can also be impacted by sound produced during military activities, with significant effects occurring at received levels lower than previously predicted. Although there are many stranding events that have occurred coincident with the presence of naval vessels or exercises, it is important to emphasize that even the absence of strandings in a region does not equate to an absence of deaths, i.e., absence of evidence does not mean evidence of absence. Strandings may be undetected, or be unlikely to be observed because of a lack of search effort or due to coastal topography or characteristics. There may also be “hidden” impacts of sonar and exercises not readily observable (e.g., stress responses). Due to the level of uncertainty related to this issue, ongoing baseline monitoring for cetaceans in exercise areas is important and managers should take a precautionary approach to mitigating impacts and protecting species.

Keywords: cetacean, beaked whales, mass strandings, sonar, underwater noise, conservation, naval exercises

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Science
CURRENT ISSUE
A big bang theory of big brain trauma
One of the biggest neurophysiological science news headlines of the 2024 summer reported a critical link between post-traumatic stress disorder (PTSD), suicide, and brain injury from blast events in members of the elite US fighting force, Navy SEALs. Researchers from the Department of Defense Uniformed Services University Brain Tissue Repository (DOD/USU BTR) had discovered a border of neural damage between the layers of white and gray matter comprising the cortical folds of service members' brains. Described as a distinctive anatomical line of astroglial scarring along the shared junctions of gray and white cellular zones of the brain, this tissue injury was unlike that observed for concussive brain trauma. Rather, it was consistent with blast biophysics of mammalian tissues. In this new study, the damage appears to be correlated with long-term, repeated exposure to blast waves from nearby explosions or firing weapons. A cascade of progressive unexplained behaviors, cognitive decline, and severe depression in the trained fighters ensued. This analysis suggested that repetitive, ionizable pressure waves traveling through the service members' heads and

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Blast injury on harbour porpoises (*Phocoena phocoena*) from the Baltic Sea after explosions of deposits of World War II ammunition

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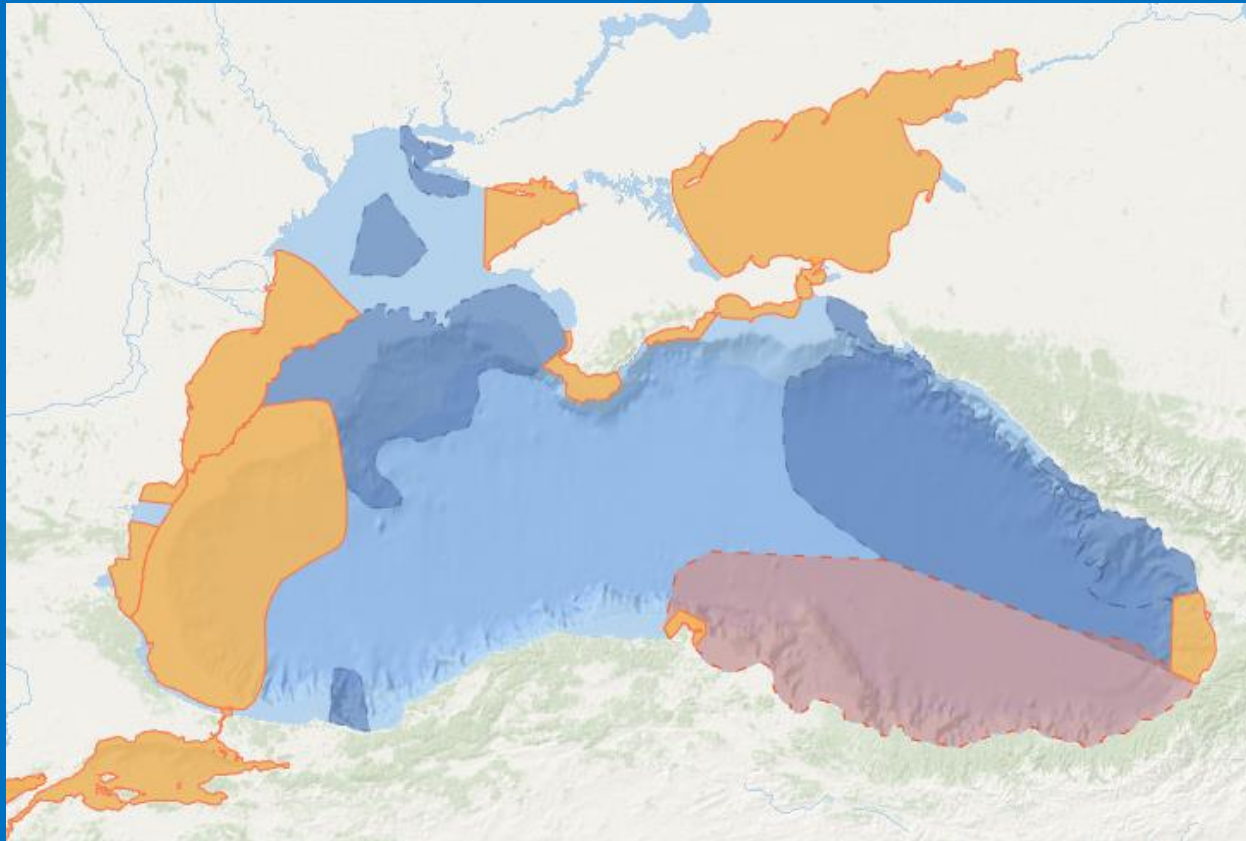
Keywords:

- Marine mammals
- Blunt injury
- Acoustic trauma
- Ammunition
- Explosions
- Health effects

ABSTRACT

Harbour porpoises are under pressure from increasing human activities. This includes the detonation of ammunition that was dumped in large amounts into the sea during and after World War II. In this context, forty-two British ground mines from World War II were cleared by means of blasting in the period from 20 to 31 August 2019 by a NATO unit in the German Exclusive Economic Zone within the marine protected area of Fehmarn Belt in the Baltic Sea, Germany. Between September and November 2019, 24 harbour porpoises were found dead in the period after those clearing events along the coastline of Schleswig-Holstein and were investigated for direct and indirect effects of blast injury. Health evaluations were conducted including examinations of the brain, the air-filled (lungs and gastrointestinal tract) and acoustic organs (melon, acoustic fat in the lower jaw, ears and their surrounding tissues). The bone structure of the tympano-periotic complexes was examined using high-resolution peripheral quantitative computed tomography (HR-pQCT). In 0/24 harbour porpoises, microfractures of the malleus, dislocation of middle ear bones, bleeding, and haemorrhages in the melon, lower jaw and peribullar acoustic fat were detected, suggesting blast injury. In addition, one bycaught animal and another porpoise with signs of blunt force trauma also showed evidence of blast injury. The cause of death of the other 14 animals varied and remained unclear in two individuals. Due to the vulnerability and the conservation status of harbour porpoise populations in the Baltic Sea, noise mitigation measures must be improved to prevent any risk of injury. The data presented here highlight the importance of systematic investigations into the acute and chronic effects of blast and acoustic trauma in harbour porpoises, improving the understanding of underwater noise effects and herewith develop effective measures to protect the population level.

Important Marine Mammal Areas



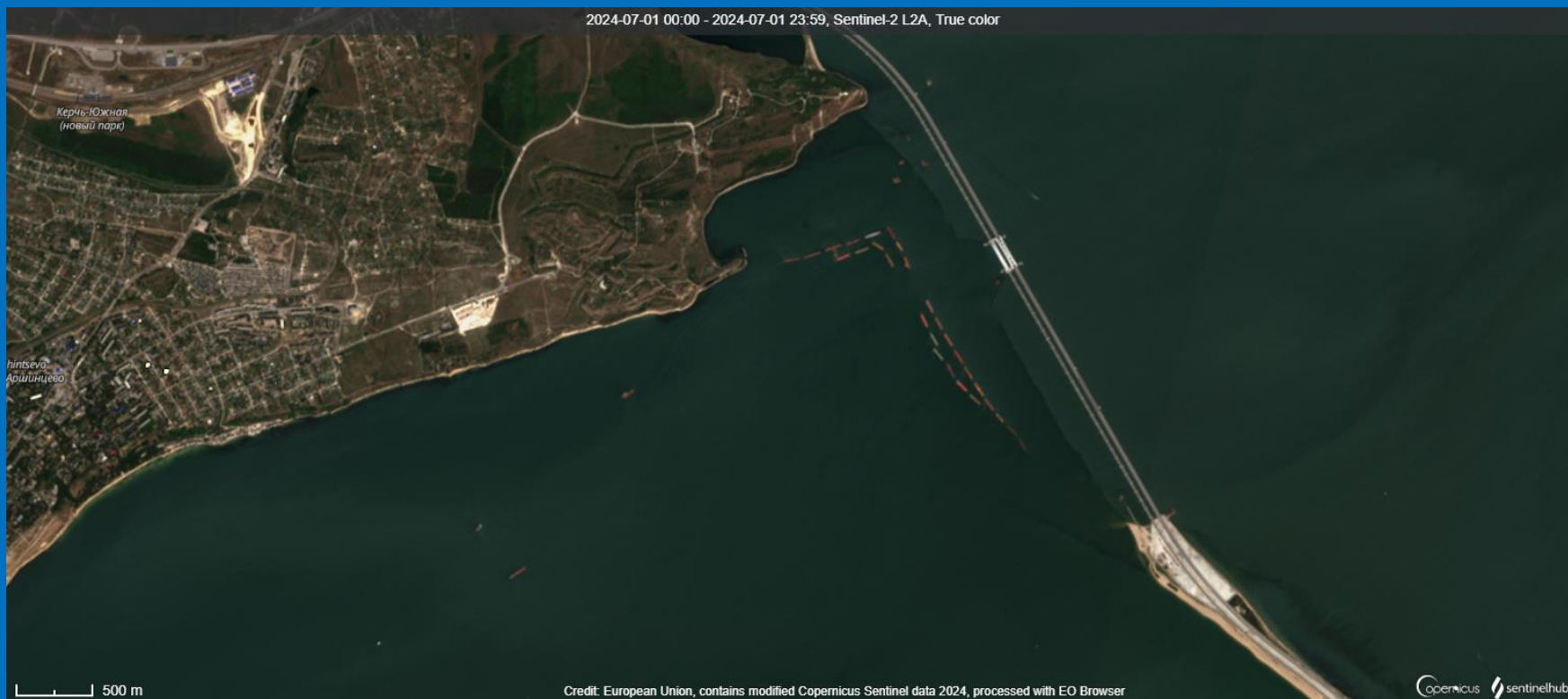
Russia's War & dolphin deaths in 2022

- More than 900 cases, twice more than in average
- Many common dolphins
- 35 live strandings
- At the same time as missile attacks from submarines

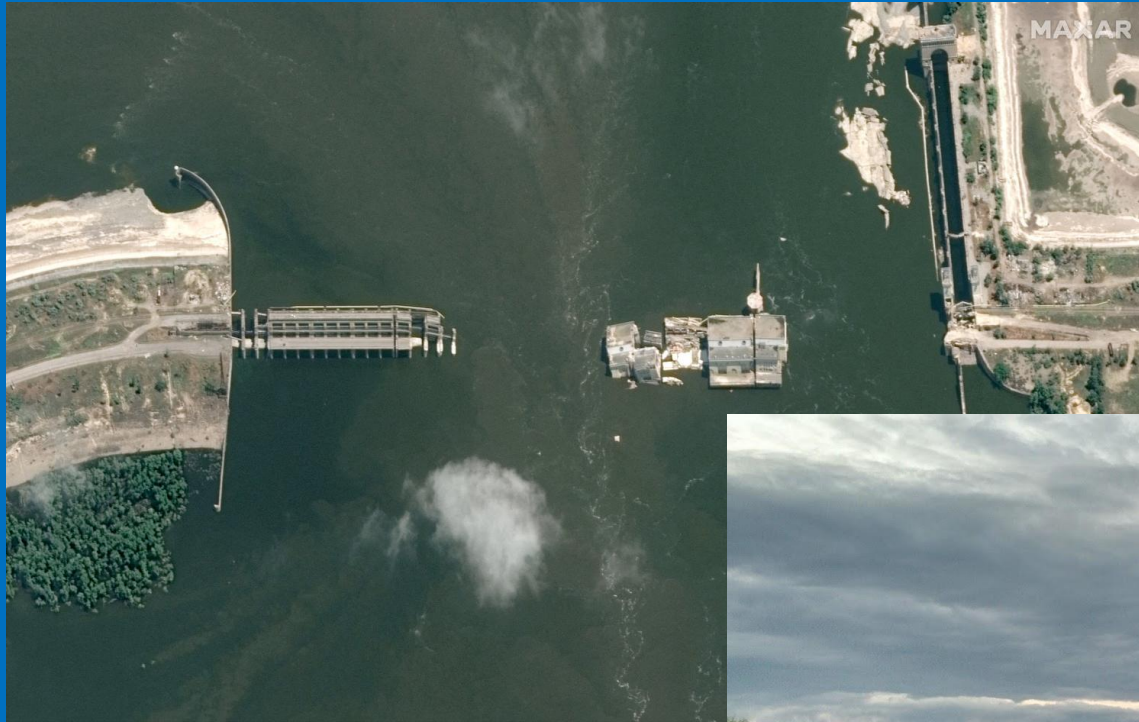
Kerch Strait



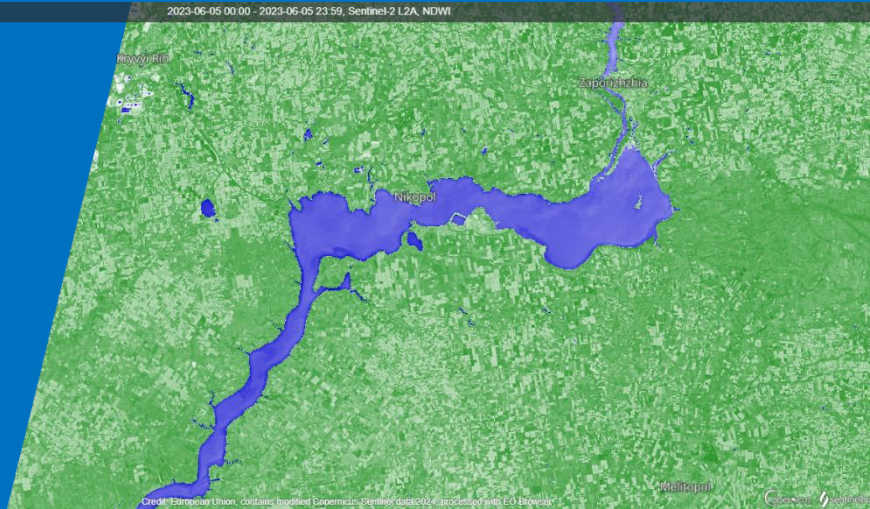
Kerch Strait



Kakhovska Dam blown up, June 6, 2023

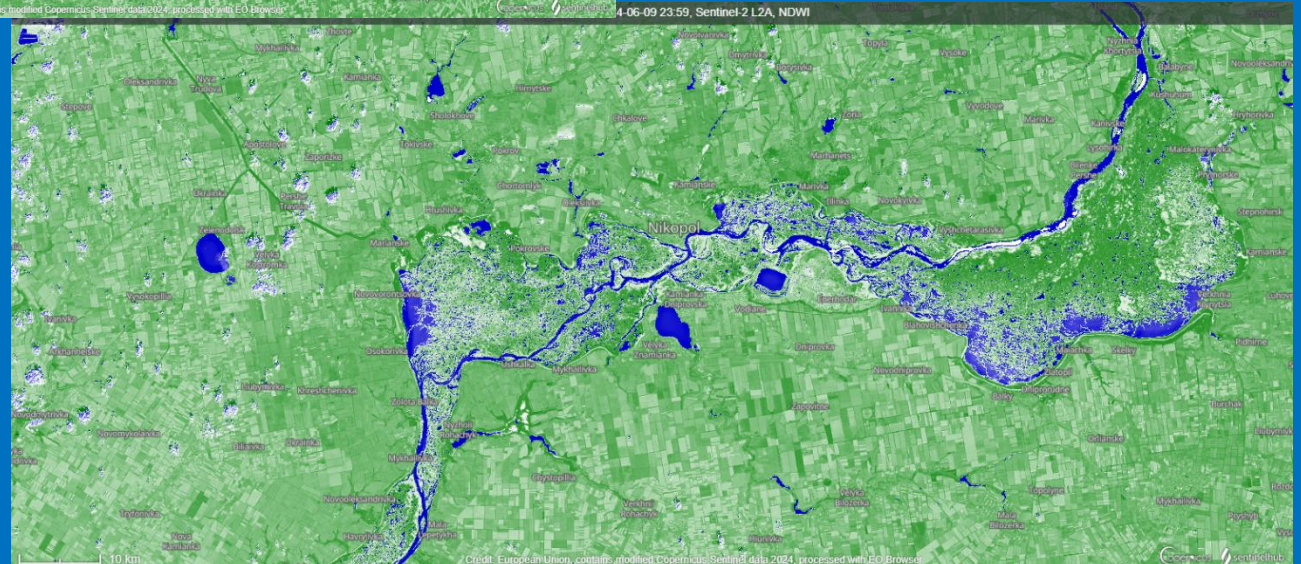


Kakhovka Reservoir



Mykolajiv

20 km



Die off, displacement, litter, algal bloom



Conclusions

- Threats evolve and change
- Short-term consequences arise
- Both Russia's combat and non-combat activities are equally threatening
- Factors increasing bycatch risk are trauma, stress and displacement/redistribution of both cetaceans and their prey
- ACCOBAMS SC recommendation: post-war plan