

# Kakhovska dam damage and flood event monitoring using satellite data, 6 June 2023

At approximately 3 a.m. on 6 June 2023, the dam of the Kakhovska Hydroelectric Power Plant (HPP) was breached and subsequently destroyed. This resulted in uncontrolled water release from the Kakhovka Reservoir and flooding of riverside areas downstream towards the Dnipro River Delta. The Head of the Kherson Regional Military Administration reported that an estimated 16,000 persons in 17 settlements on the right bank of the Dnipro River are located in areas within the flooding zone [1].

According to the Head of Kherson Regional Military Administration, as of 07:30 a.m. on 6 June, the following settlements on the right bank of the river were already partially or completely flooded: Tiahynka, Lvove, Odradokamianka in Beryslav district, Ivanivka, Mykilske, Tokarivka, Poniativka, Bilozerka, and the Ostrov neighborhood of Kherson city in Kherson district.

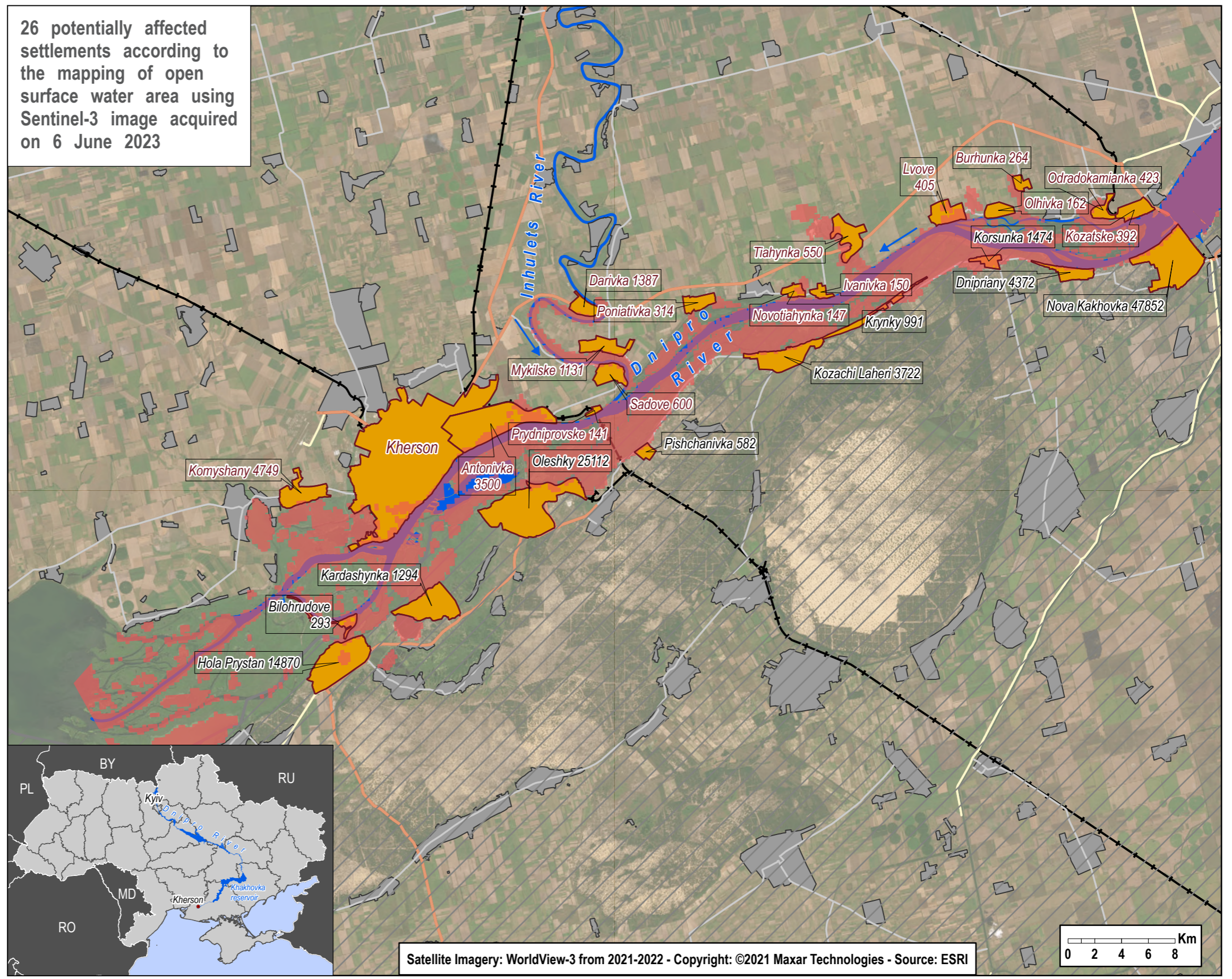
REACH initiated the satellite-based situation monitoring, based on open-source satellite remote sensing. The map shows the open water area, mapped from Sentinel-3 imagery [2] captured on the morning of 06 June 2023 [3]. Sentinel-3 satellites enable a short revisit time of less than two days for the OLCI instrument to capture images with 300-m spatial resolution.

The flood situation remains volatile and subject to change.

Note: For areas under the control of the Government of Ukraine, data from June 2023 was used, while for other parts of the flood impact zone the pre-war population number was employed.

1. CNN "Collapse of critical Ukrainian dam sparks region-wide evacuations" Access: <https://edition.cnn.com/2023/06/06/europe/ukraine-nova-kakhovka-dam-breach-intl-hnk/index.html>  
 2. ESA "Sentinel-2 overview". Access: <https://sentinels.copernicus.eu/web/sentinel/missions/sentinel-3>  
 3. EO Browser "open-source web-based tool for browsing, visualization and analysis of satellite imagery available at various platforms". Access: <https://apps.sentinel-hub.com>

26 potentially affected settlements according to the mapping of open surface water area using Sentinel-3 image acquired on 6 June 2023



Satellite Imagery: WorldView-3 from 2021-2022 - Copyright: ©2021 Maxar Technologies - Source: ESRI

Permanent water before flood	Roads	Railway lines
Out of governmental control of Ukraine	primary	Settlements affected by flood
Flooded area (open water) as of morning 06 June 2023	secondary	Other settlements
	tertiary	Sadove Sadove Flood-affected settlements on GCA (red) and NGCA (black) along with estimated population

Data sources:  
 Flooded area - classified Sentinel-3 imagery of morning 06 June 2023;  
 Permanent water, roads, railways - ©OpenStreetMap contributors;  
 Settlements - OCHA;  
 Population number - Ukrstat, IMPACT;  
 NGCA as of 5 June 2023 - <https://liveuamap.com/uk>