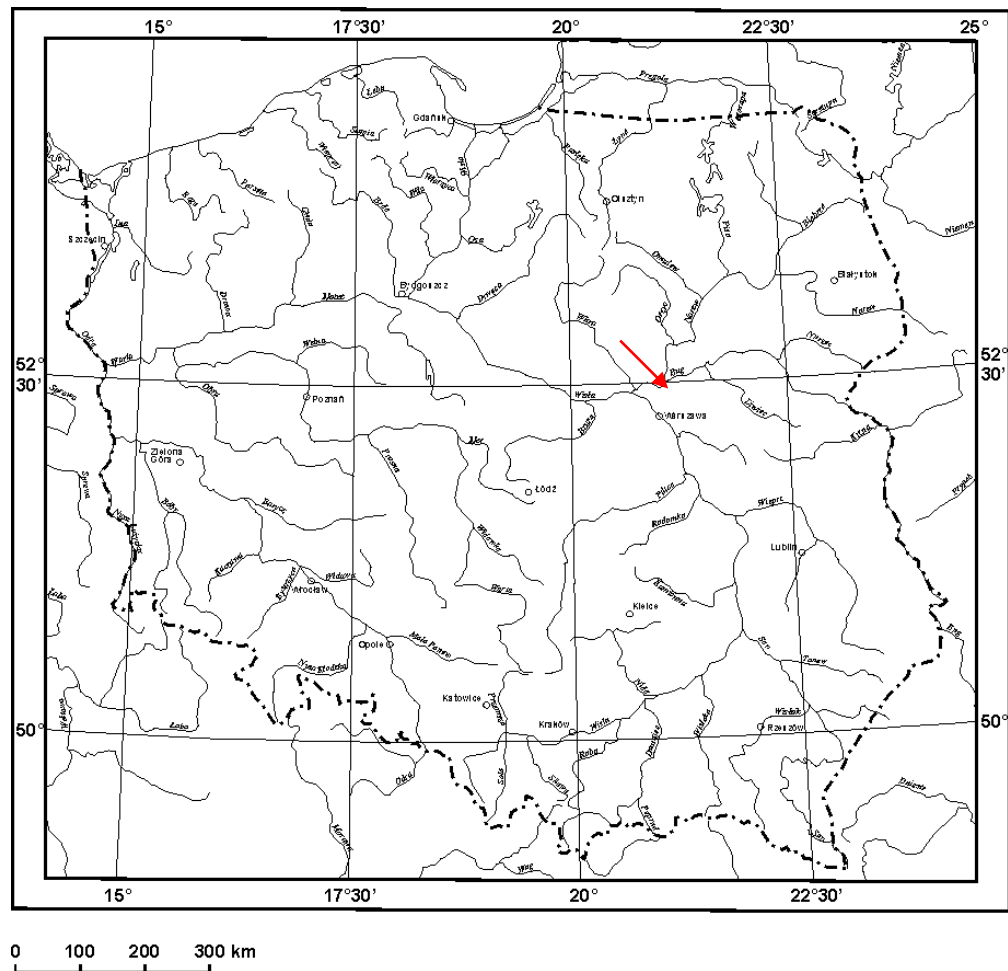


Sedimentation conditions in small anthropogenic pond estimated by fast field measurements with the use of unmanned vehicles

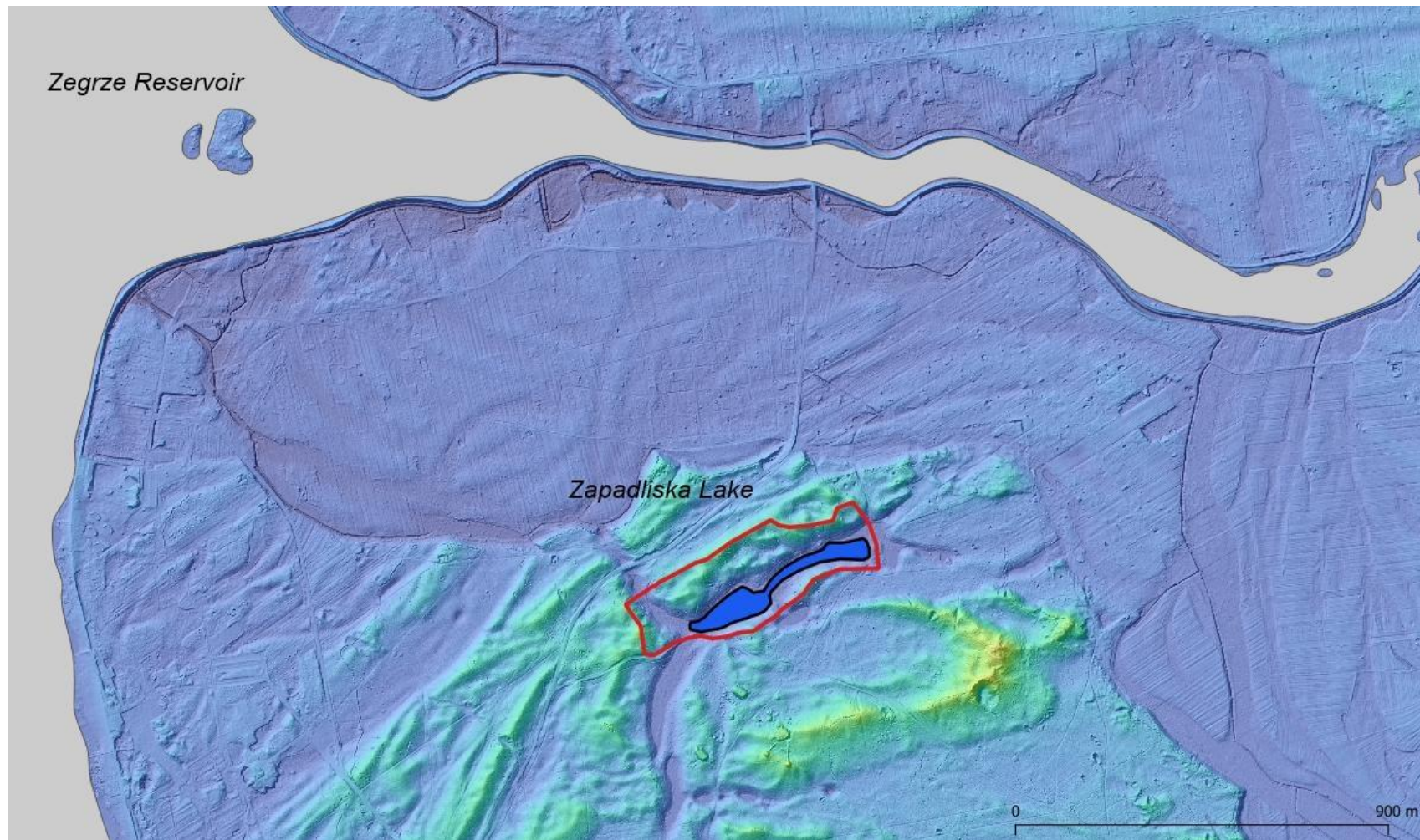
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Zapadliska Lake is situated approximately 1 km from the Zegrze Reservoir, near the confluence of the Narew and Rządza rivers



Location of Zapadliska Lake and its catchment



Path of flight lines designed to register orthophoto of Zapadliska Lake

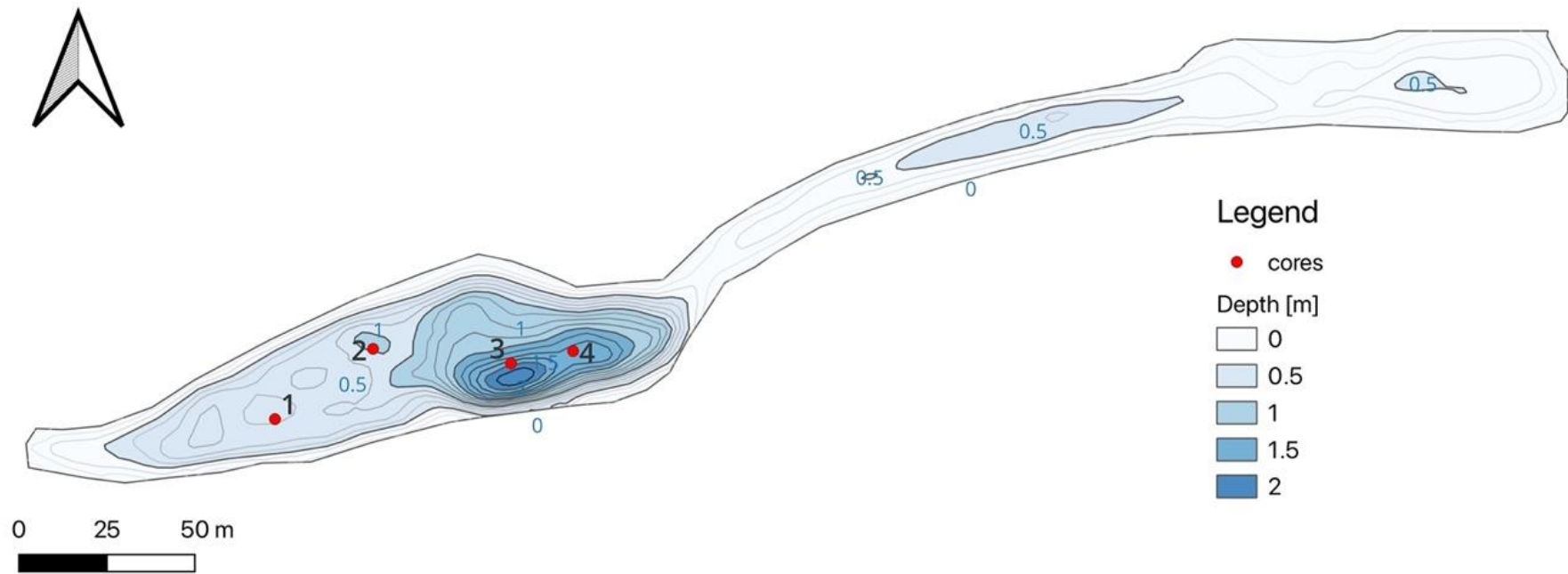


Orthophoto of Zapadlisko Lake obtained from a drone DJI Mini



Unmanned radio-controlled catamaran boat with electric motors propulsion equipped with sonar and GPS receiver

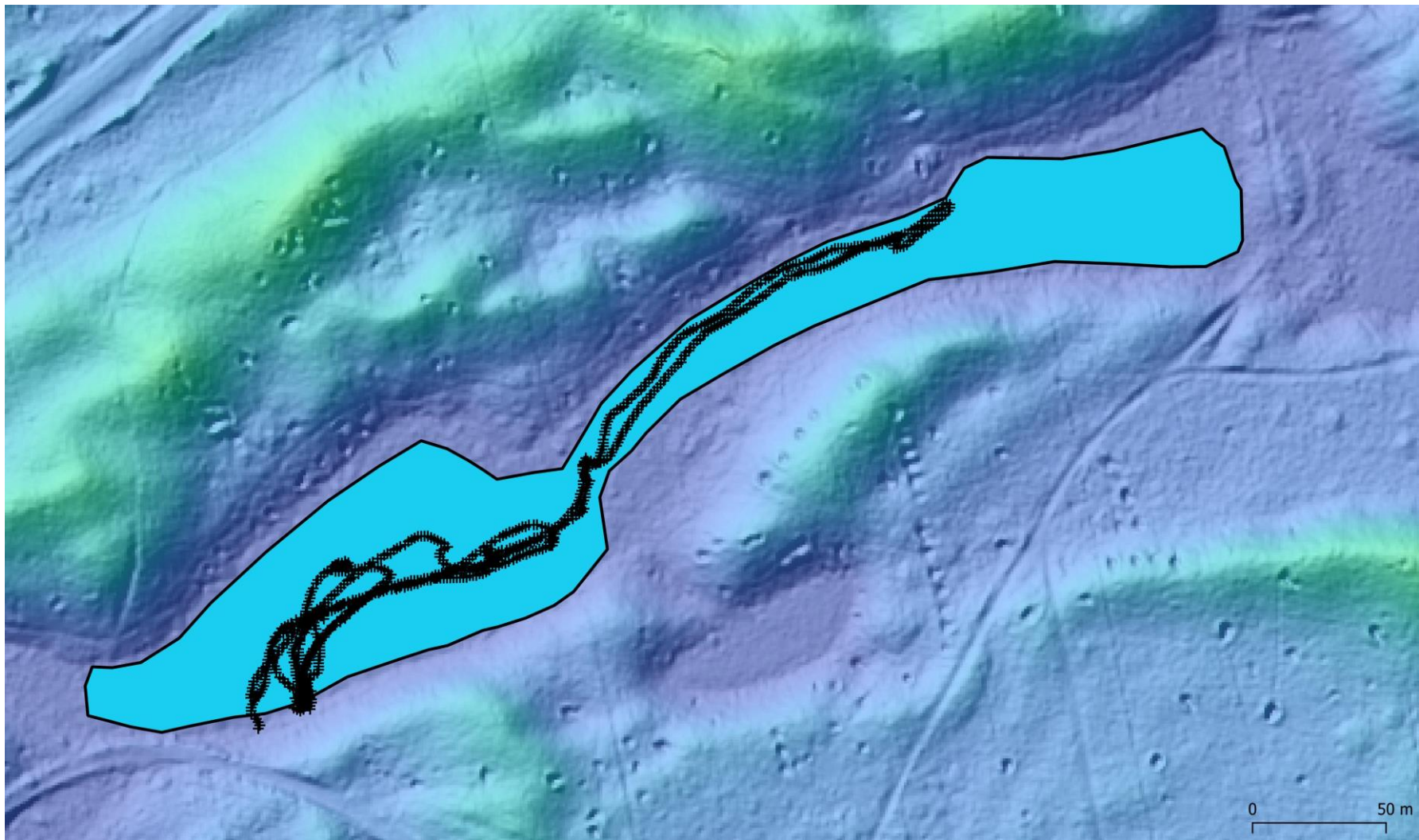




Bathymetric map with sampling cores

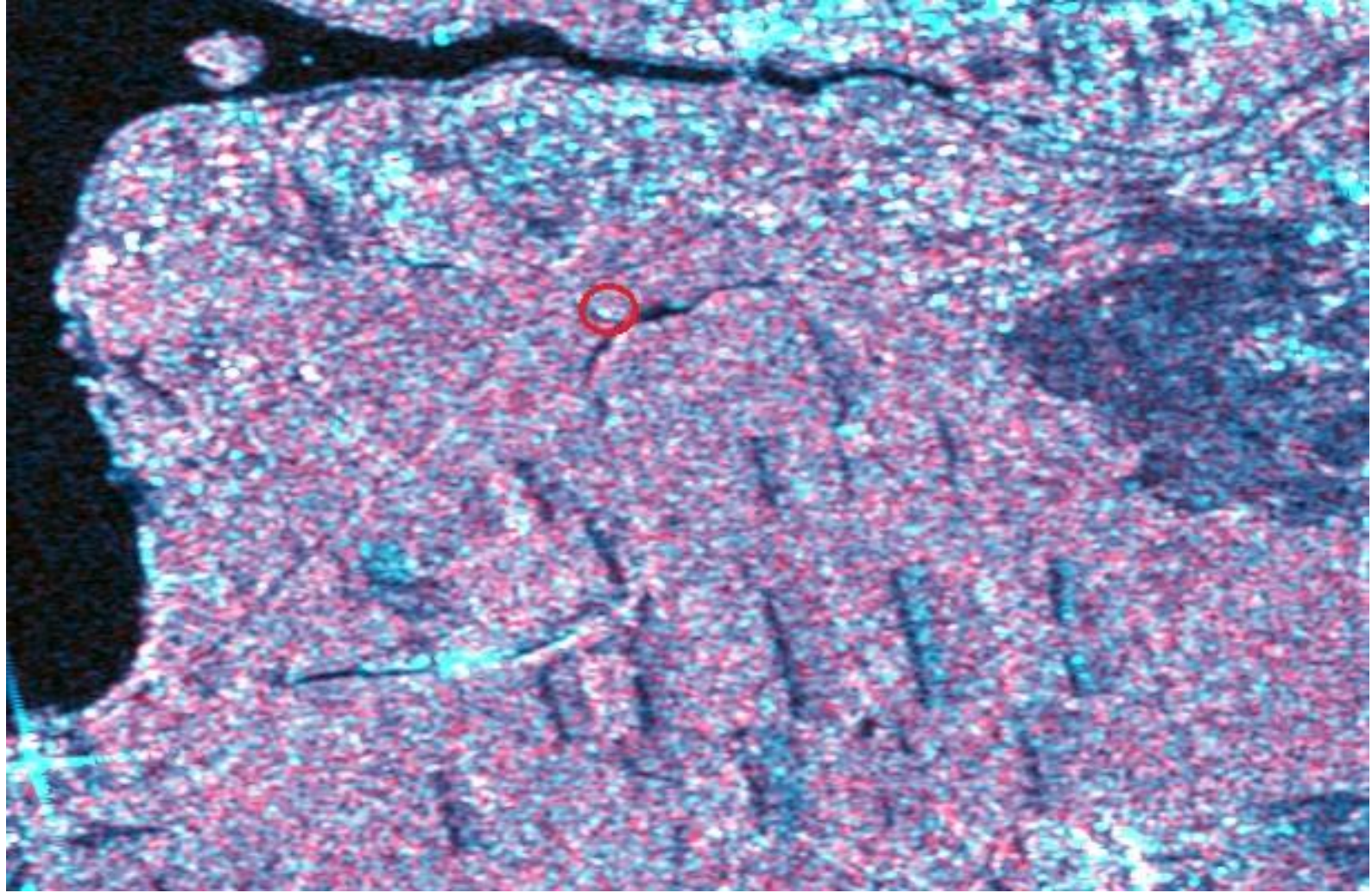


Kajak sediments sampler



Path of the pontoon boat





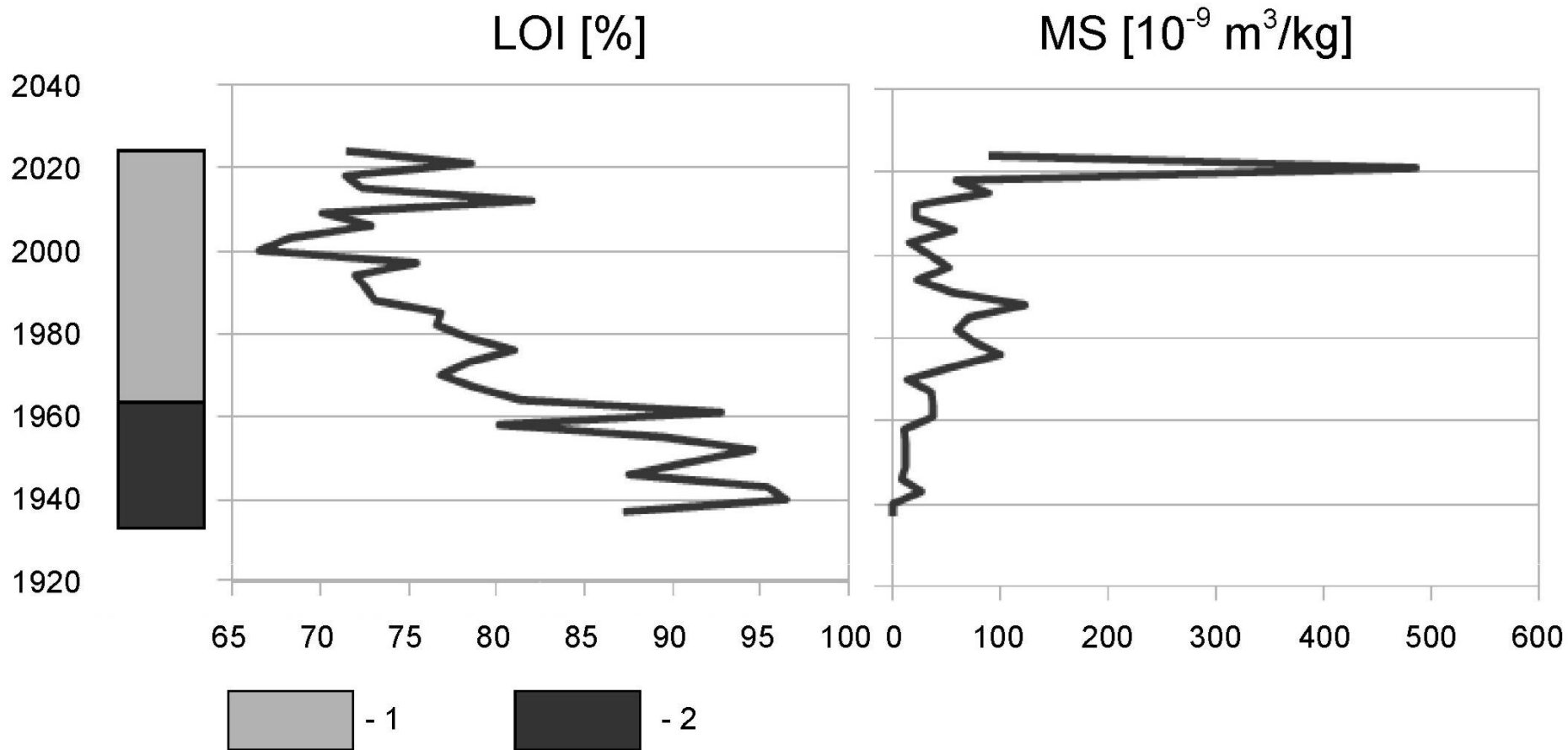
Sentinel-1 satellite image from October 30, 2022, showing the beginning of deforestation works in the catchment of Zapadliska Lake

Sentinel-2 satellite image from November 03, 2022,
showing the end of deforestation works in the
catchment of Zapadliska Lake



Results of the water chemistry measurements of Zapadliska Lake (Karczmarzyk, 2016)

Date	EC (μ S/cm)	Water temperature (°C)	Hardness (°d)	PO ₄ (mg/l)	NO ₃ (mg/l)	SO ₄ (mg/l)	pH
14.09.2015	116	16.8	1	<0.01	<0.1	93.3	6.5
21.12.2015	112	4.6	2.2	0.029	1.31	38.7	6.5
21.03.2016	113	6.5	3	0.048	0.54	19.2	6.75
26.05.2016	77	19.2	not detected	<0.01	0.96	16.5	4.5



Depth and time distribution of variability of organic matter content and magnetic susceptibility
in bottom sediments of Zapadliska Lake

1 – lake sediments, 2 – peat sediment

Conclusion

1. The new field instruments such as unmanned boat with sonar and GPS receiver as well as quadcopter with high resolution camera and GPS antenna have been used for a fast measurement in the field.
2. The data obtained made possible to calculate instant bathymetric map with recent shoreline and depths.
3. One day field work provided the data for calculating Zapadliska Lake morphometry and selecting sampling points for bottom sediments sampling.
4. The features of the bottom sediments show that the beginning of Zapadlisko Lake formation has changed the sedimentation conditions in the depression.
5. The results of analyses of the contemporary sediments indicate disturbance of the environmental conditions in the catchment area which can be related to the local deforestation.

Thank you very much for attention!