

Bathymetry, s'Albufereta Nature Reserve, Mallorca

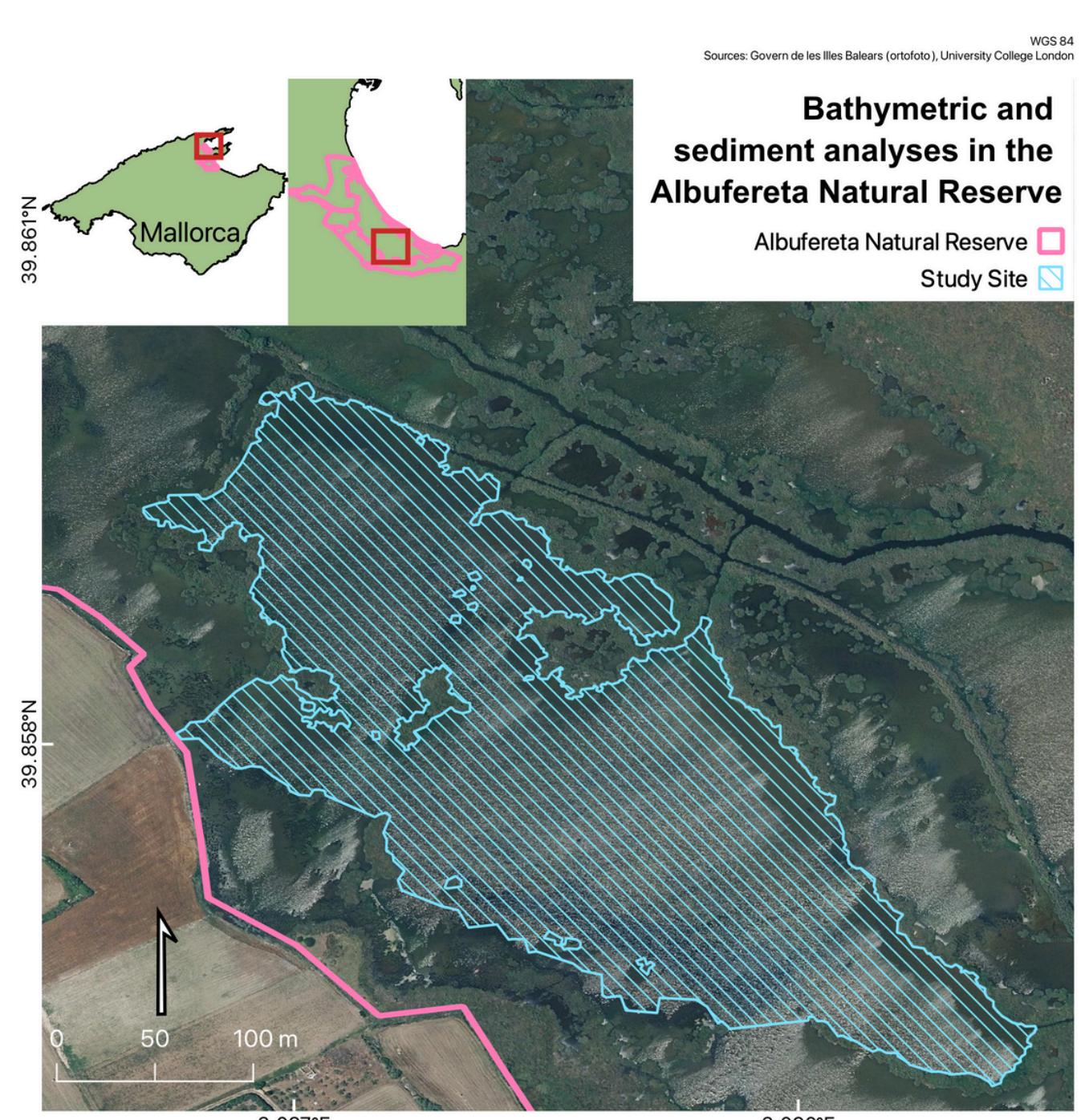
The project investigates bathymetry, lakebed sediment, and turbidity in lakes within the s'Albufereta Nature Reserve in Mallorca using field measurements, laboratory analysis, and GIS-based digital interpolation. It compares different spatial interpolation methods to assess accuracy and examines how environmental factors influence water depth, sediment distribution, and turbidity patterns. The results inform lake morphology, data reliability, and future monitoring and management of sensitive wetland ecosystems.

Software:
QGIS, ArcGIS, MatLab, Python

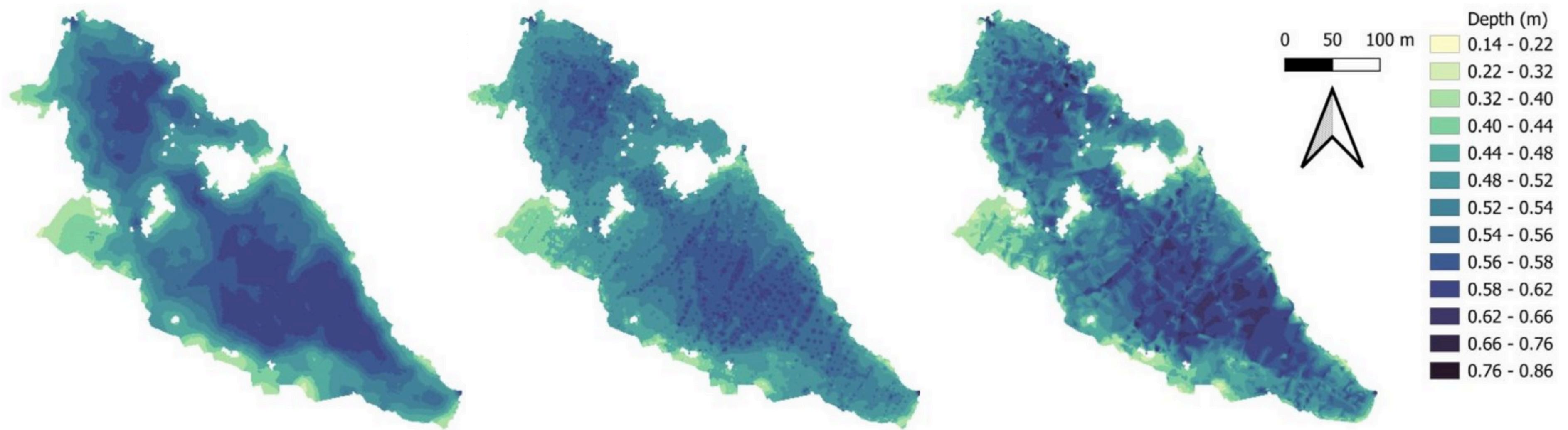
Mapping and data visualisation:



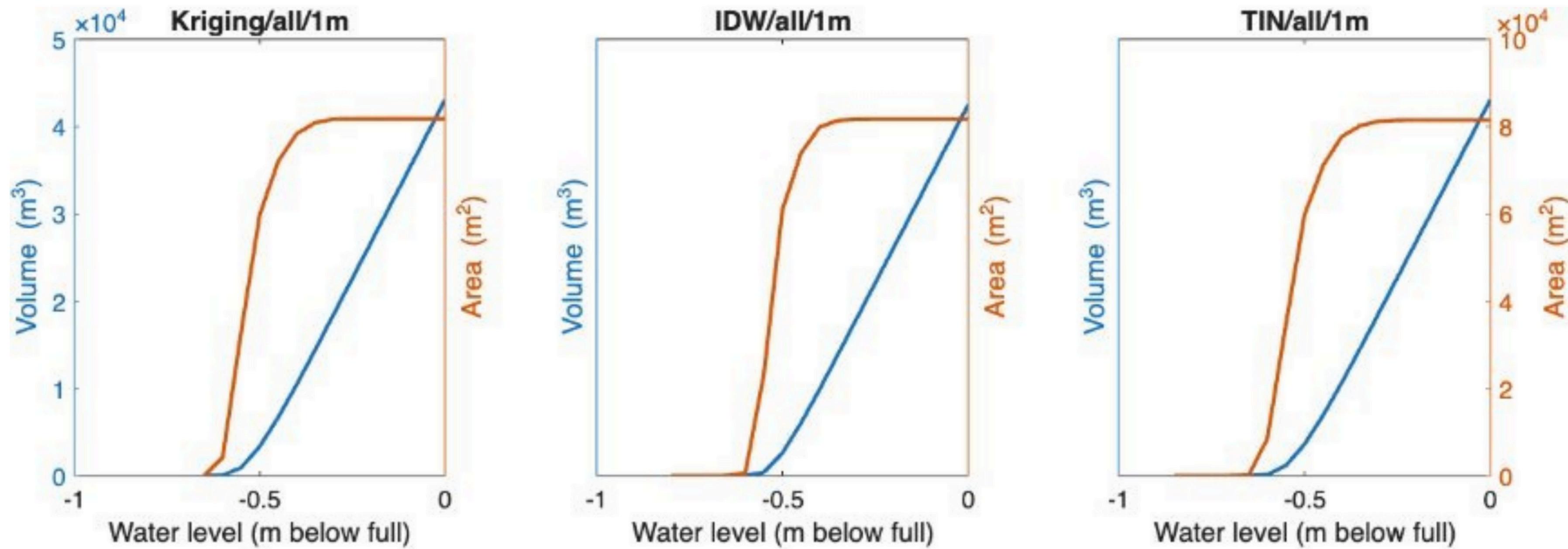
Map of datapoints collected during fieldwork in s'Albufereta Nature Reserve, Mallorca.



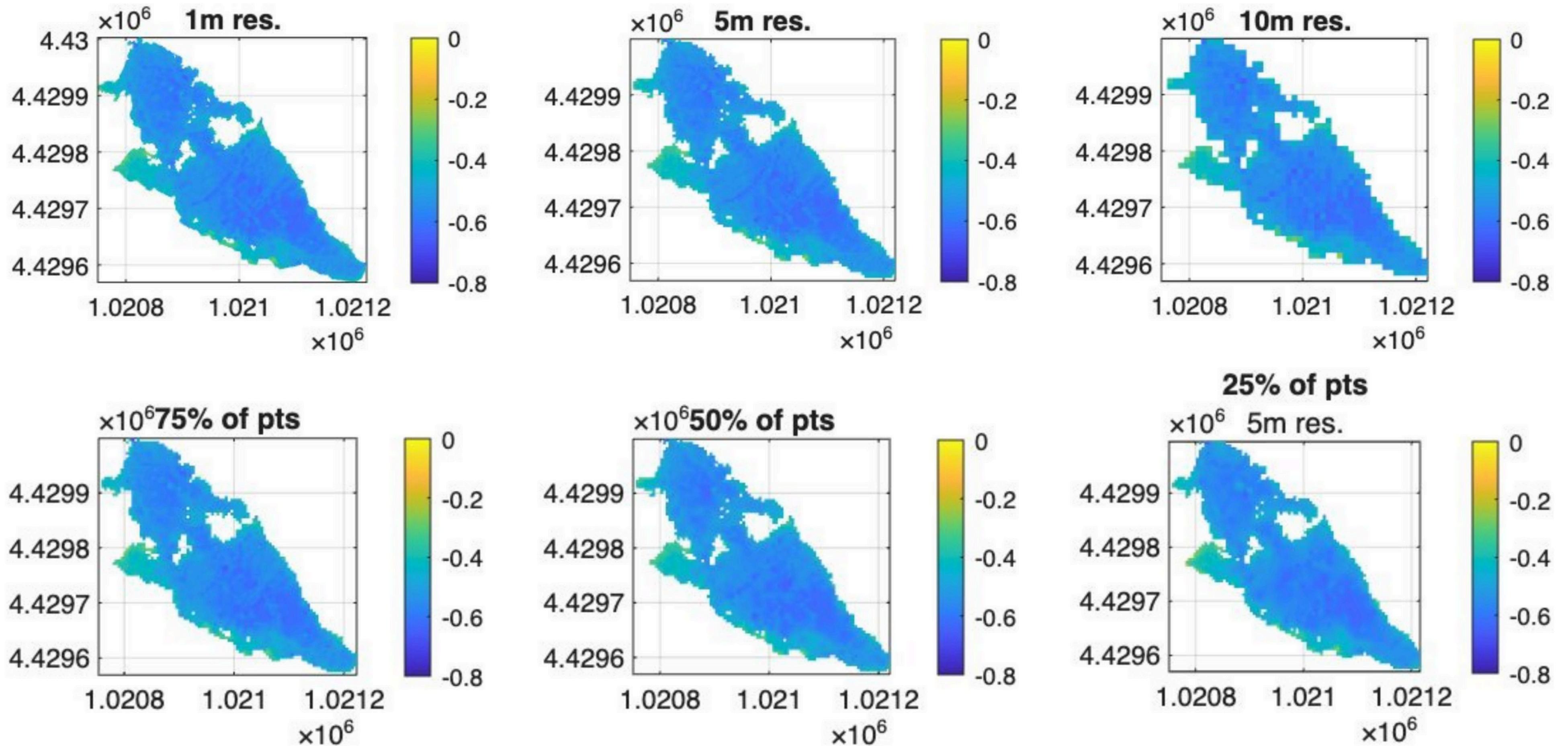
Site map of research area in s'Albufereta Nature Reserve, Mallorca.



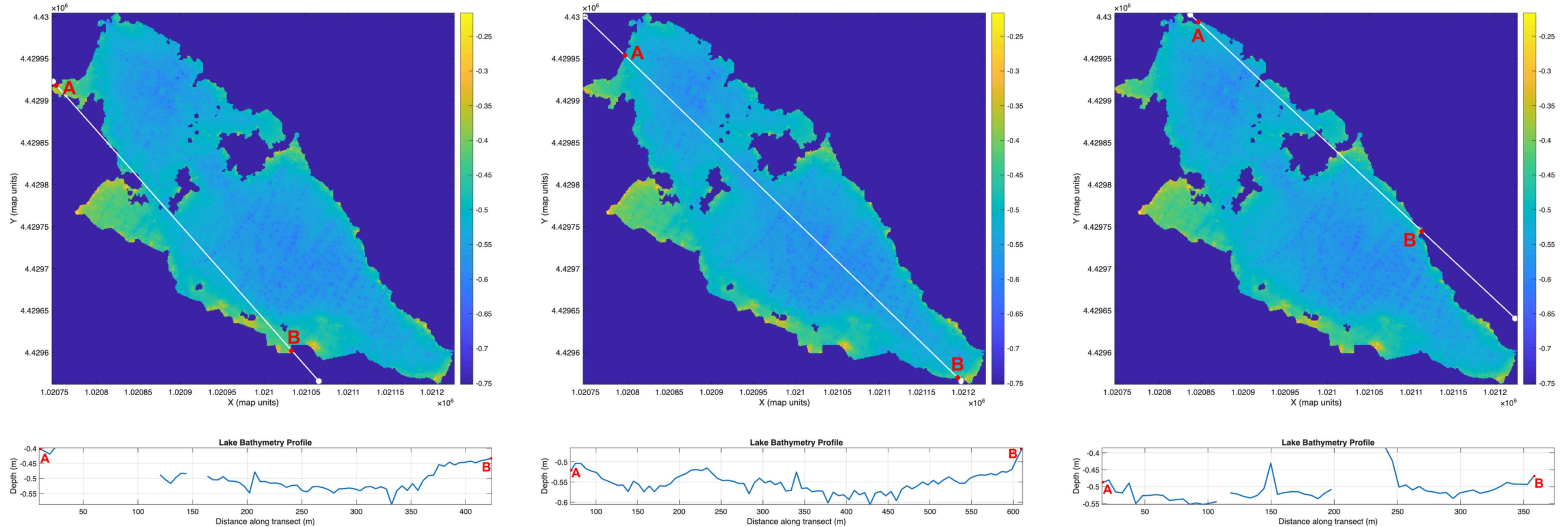
Comparison of bathymetric interpolation methods: Kriging, Inverse Distance Weighting (IDW), and Tringulated Irregular Network (TIN) at 1 m resolution.



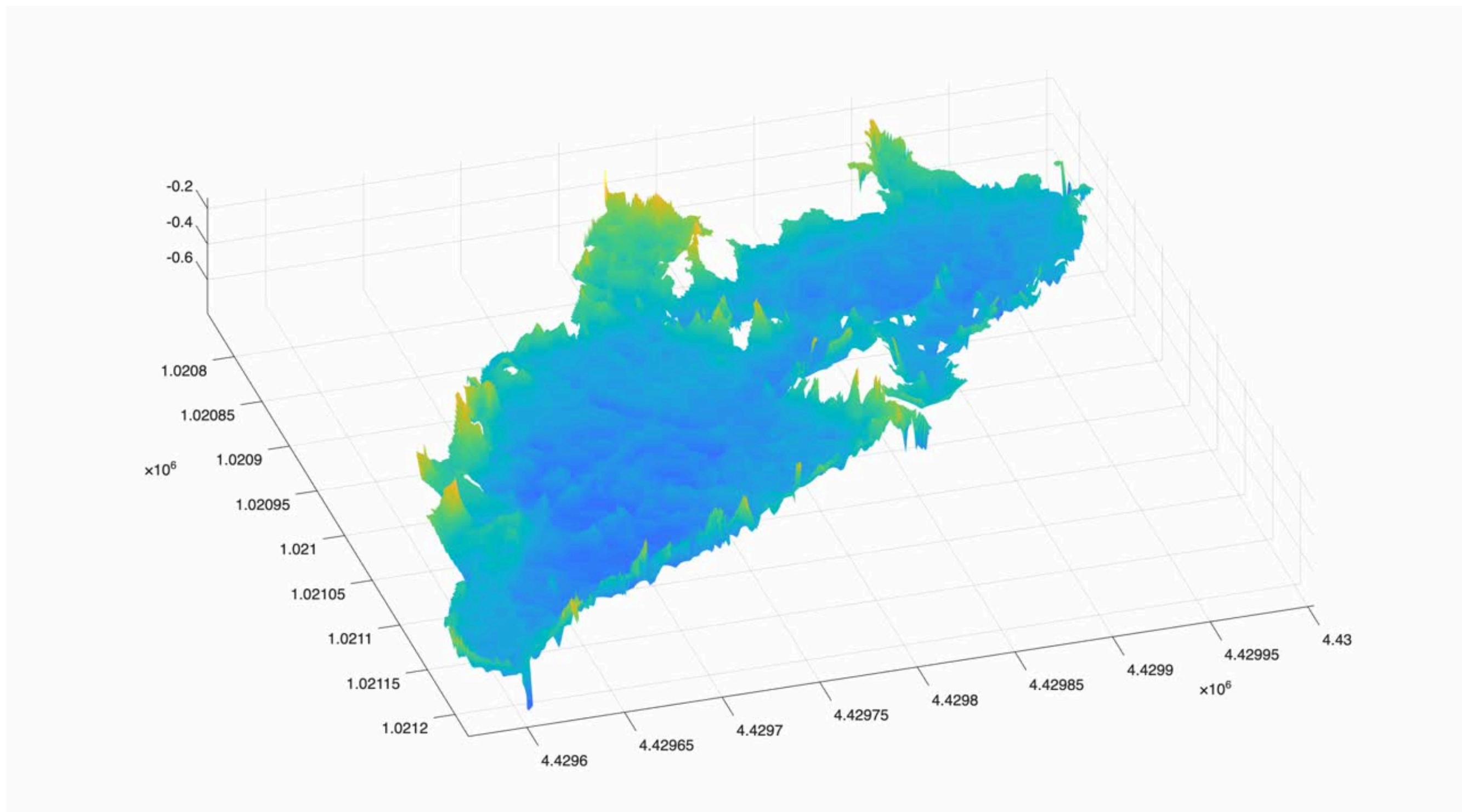
Water level-area-volume relationships derived from bathymetric surfaces generated by Kriging, IDW, and TIN interpolation. Changes in lake volume (blue) and surface area (orange) are shown as a function of water level below full capacity.



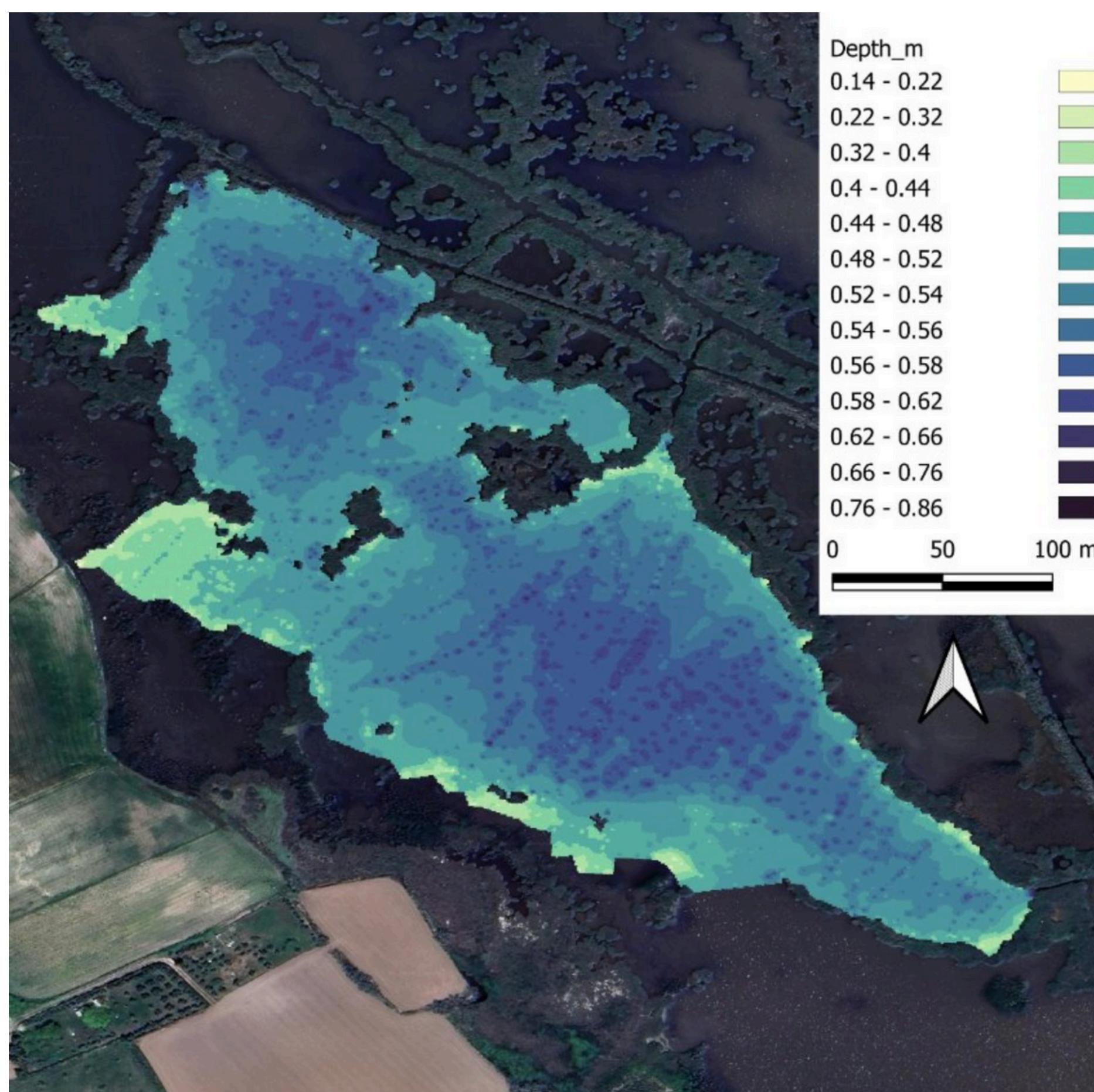
Sensitivity of bathymetric interpolation results to spatial resolution and data density; Bathymetric surfaces generated using IDW interpolation at 1 m, 5 m, and 10 m resolution (top row) and using reduced datasets (75%, 50%, and 25% of points; bottom row), illustrating the effects of resolution and sampling density on depth representation



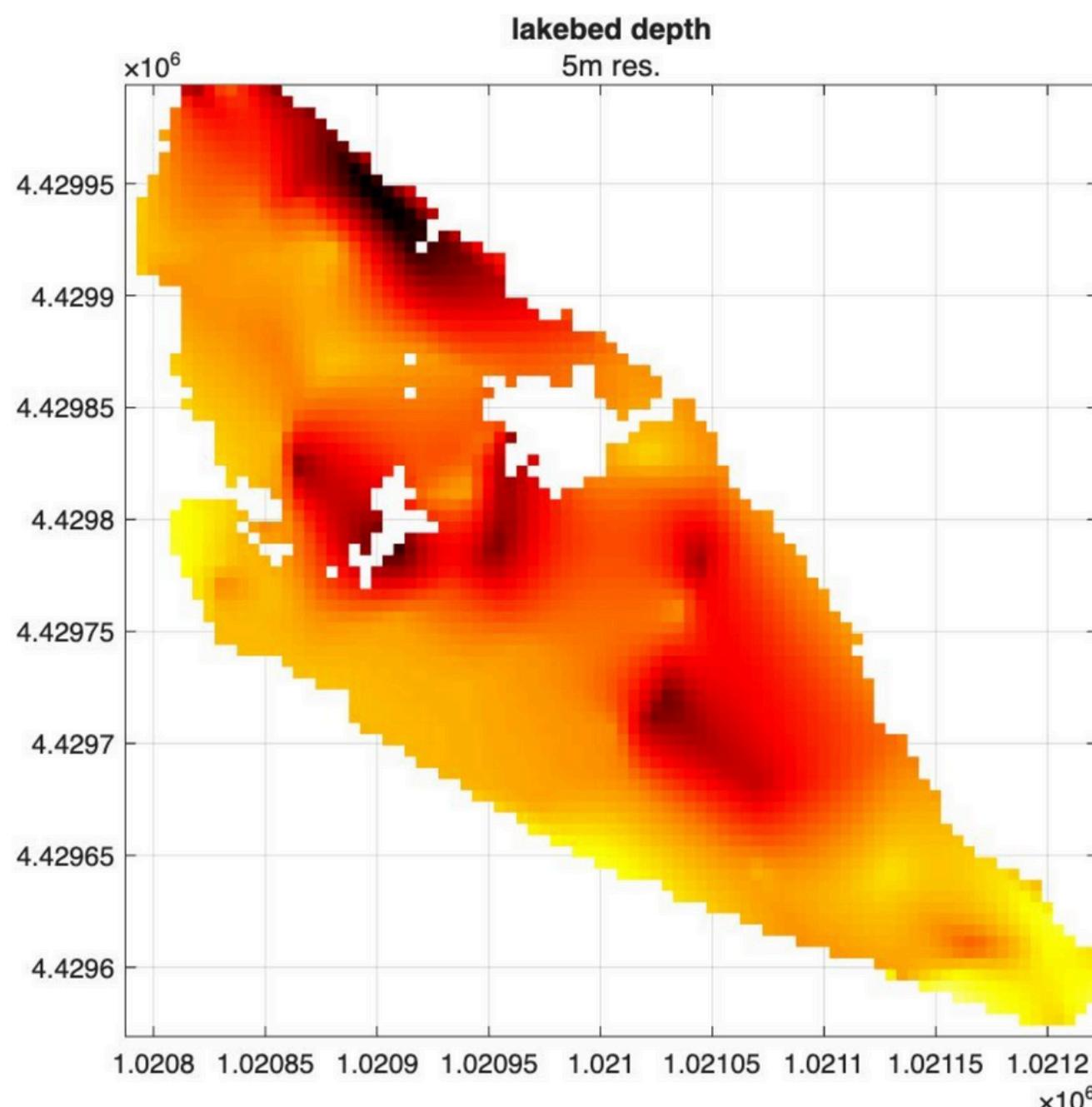
Bathymetric transects and corresponding depth profiles across the lake. The upper panels show interpolated bathymetric surfaces with transect lines (A–B), while the lower panels display lakebed depth profiles extracted along each transect, illustrating spatial variations in depth across the basin.



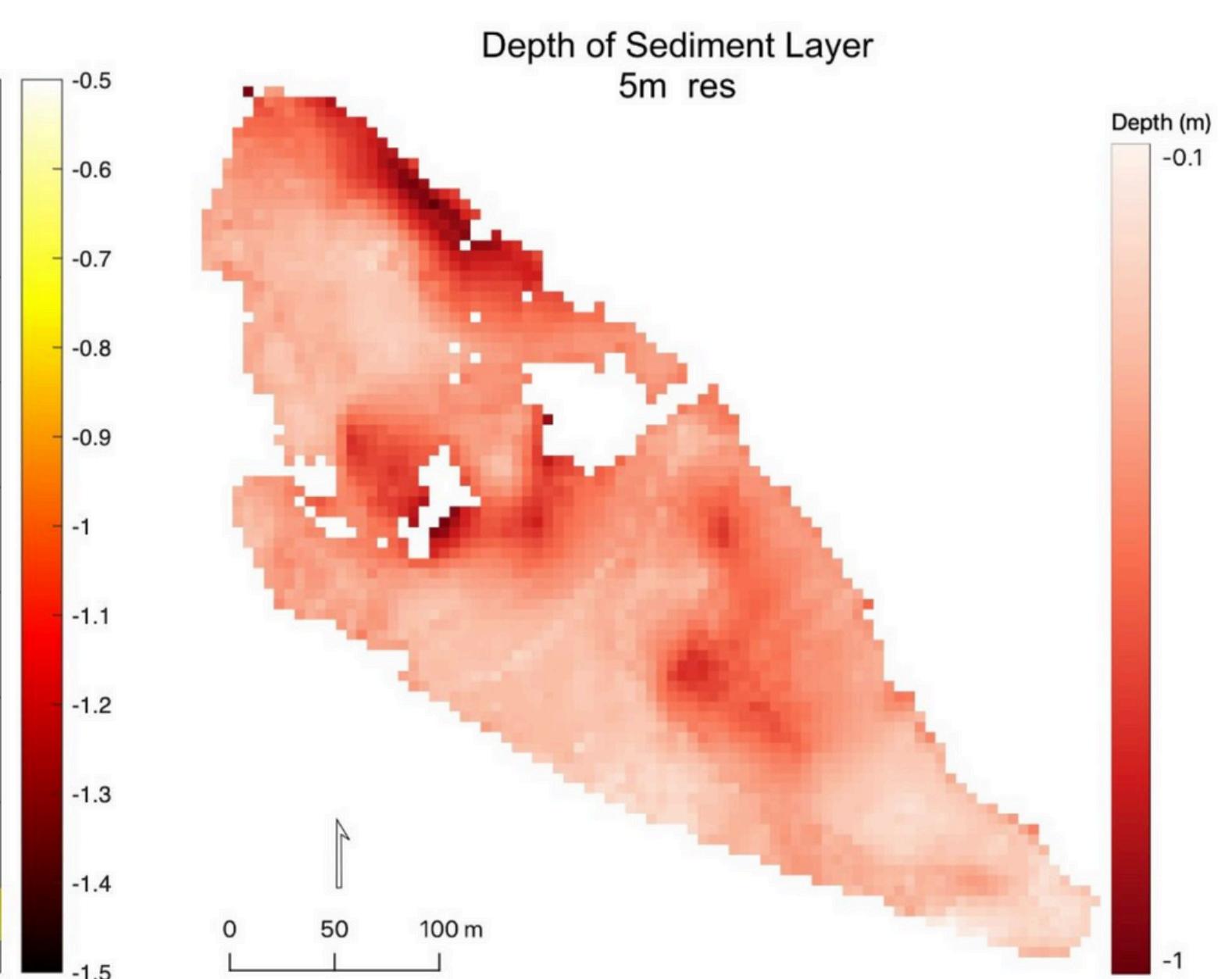
Three-dimensional visualisation of the interpolated lake bathymetry, showing depth variation across the basin. Video available [here](#).



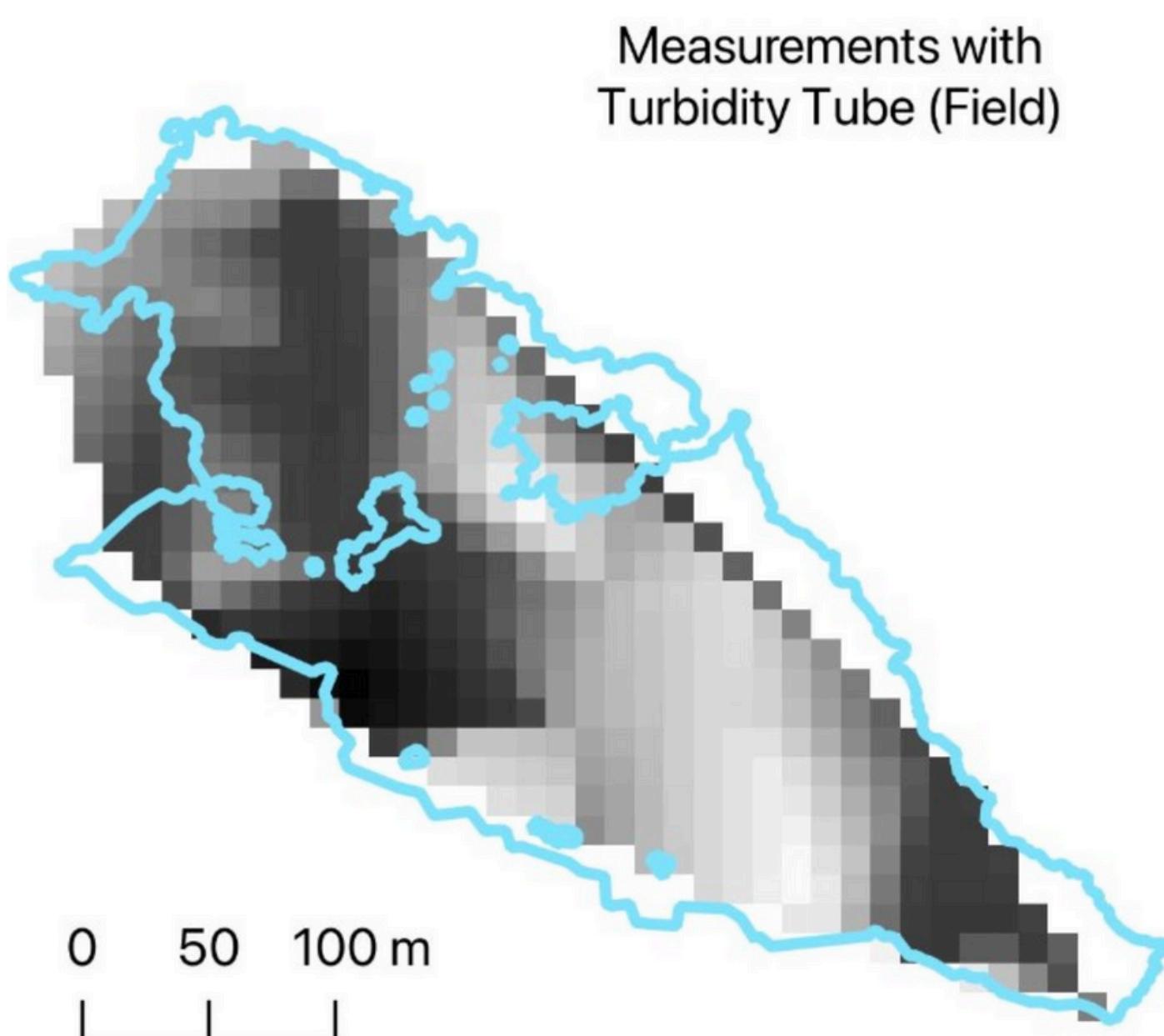
Interpolated bathymetric map of the study lake showing spatial variation in water depth (m), overlaid on satellite imagery for spatial context.



Interpolated lakebed sediment depth map at 5m spatial resolution, showing the thickness of the sediment layer (m) across the lake.



Interpolated depth of the sediment layer across the study lake at 5 m spatial resolution, showing spatial variability in sediment thickness (m).



Spatial distribution of turbidity across the study lake measured using a turbidity tube in the field (left) and a nephelometer under laboratory conditions (right), illustrating differences in spatial patterns between measurement methods.

