



## **A high-resolution bathymetric survey of the Vernago reservoir, Eastern Italian Alps**

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Artificial reservoirs for hydropower production disrupt the river hydro-geomorphic continuity in Alpine basins and constitute efficient sediment traps. In so doing they strongly change upstream and downstream fluvial morphodynamics, hence alter riverine habitat conditions. Managing the surplus of sediment deposited in the reservoir, which is deducted to the natural sediment budget of the downstream channel reaches, represents one of the key components for the sustainable management of Alpine drainage basins. At the same time, in-lake siltation rates can be used as proxy for sediment yield at the outlet of a given study basin, and therefore can provide useful quantitative information on landscape downwasting. In this context, a first critical step lies in the quantification of the boundary conditions characterizing the bottom of the reservoir. To this end we present the results of a high-resolution bathymetric survey of the Vernago reservoir, Senales Valley, Italy. The bathymetry has been acquired by means of SEA Swathplus interferometric sonar mounted on a 4.30 m boat. This lightweight device is particularly well-suited for working within Alpine reservoirs in that it ensures wide swath width (up to 150 m) in shallow water (down to 50 m) and high resolution (0.03 m) up to the swath edge. Data post-processing allow building a 1m-grid DEM of the reservoir floor through which we are able to resolve the geomorphic variability characterizing tributary fans, man-made subaqueous canals, areas of active deposition, and newly formed natural subaqueous channels. Future work will involve performing a DoD (DEM of difference) between the bathymetric-derived DEM and pre-reservoir topography (i.e. 1962) in order to obtain a first-order estimate of sedimentation patterns. This work is part of SedAlp ([www.sedalp.eu](http://www.sedalp.eu)), a project funded through the Alpine Space Programme.