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AquaTrack

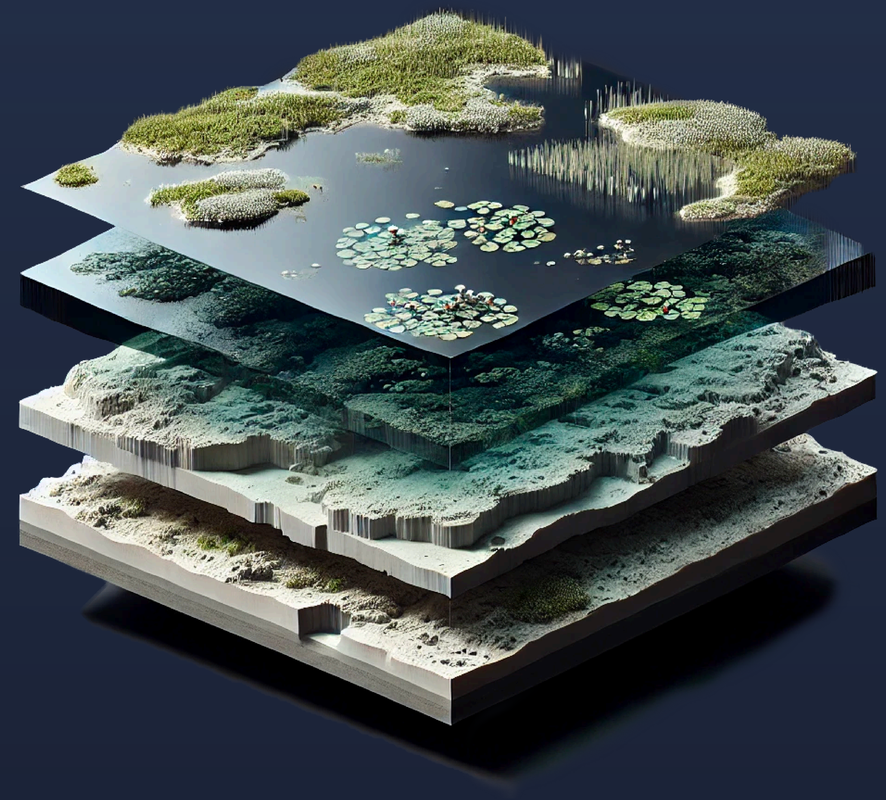
Quantification of water resources and their evolution

A new era for lake monitoring

AquaTrack is an operational service for inland water monitoring.
It provides a simple yet powerful capability:

- Monitoring the surface area of lakes and reservoirs from satellite imagery.
- Quantifying stored water volumes by combining surface with SWOT-derived elevation.
- Scaling up to hundreds of lakes and reservoirs without the need for in-situ data.

AquaTrack turns advanced Earth Observation into actionable insights for water managers and decision-makers.



Bathymetry modeling

Surface Detection (Sentinel)

- Segmentation of lakes using spectral indices and a neural network
- Produces accurate water masks at 10m resolution

Water Surface Elevation (SWOT)

- Use the SWOT L2_HR_LakeSP product to extract surface elevation
- Align elevation data to the EGM2008 geoid and retrieve area, contours and uncertainties
- Clean temporal series using quality filters and Hampel filtering for outlier removal

Fusion & Bathymetry Reconstruction

- Match Sentinel-2 surfaces with SWOT elevation
- Extrapolate bathymetry
- Compute variations of volume

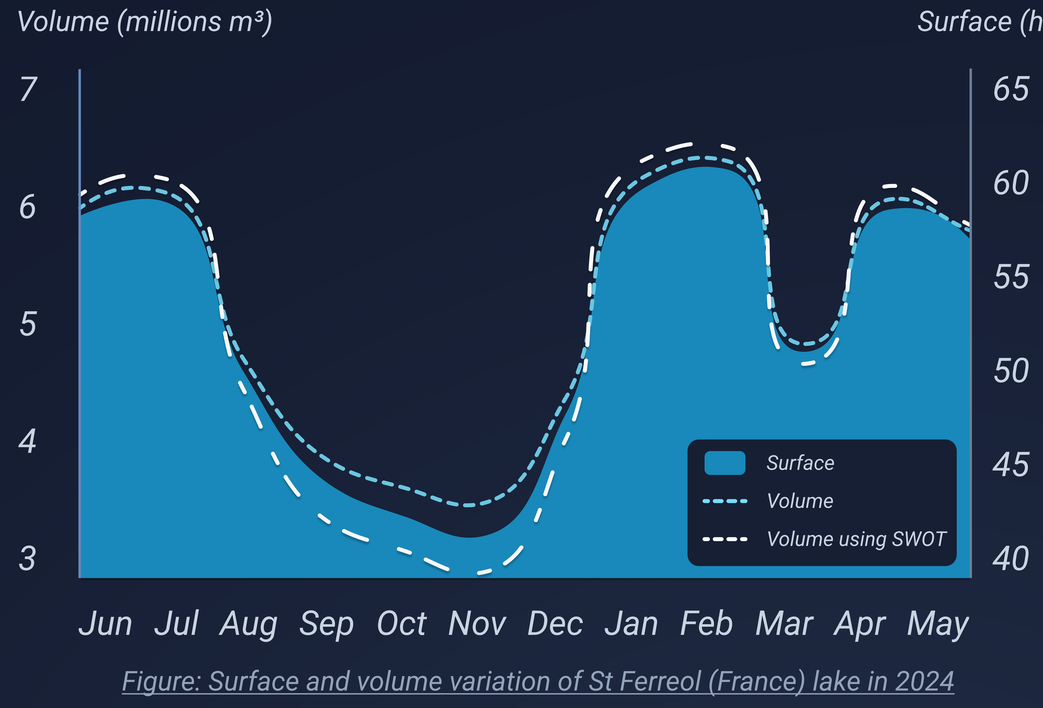


Figure: Surface and volume variation of St Ferreol (France) lake in 2024

Scale up and forecast

AquaTrack moves from local case studies to large-scale monitoring of hundreds of lakes and reservoirs, enabling systematic water resource assessment.
Through the Destination Earth framework, AquaTrack provides predictive insights on reservoir filling rates, supporting proactive and informed water management.

Key findings

AquaTrack enables regional-scale monitoring of hundreds of lakes with no need of in-situ bathymetry.
Seasonal dynamics captured: summer drawdown and winter refill clearly observed and quantified.

- AquaTrack delivers more reliable volume estimations, with reduced uncertainty compared to surface-only methods.
- The integration of SWOT allows more accurate bathymetric profiles, improving confidence in the results.
- Stronger correlation between modeled and observed water levels.

aquatrack.mundiwebservices.com

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