

Danube Delta case study

The Danube River flows into the Black Sea through a delta, the second largest and best preserved in Europe. The Danube Delta is a wetland of international importance, being a Natural Heritage Site of global relevance with the status of Biosphere Reserve (UNESCO Man and the Biosphere Programme). The delta is located in the south-eastern part of Romania and south of Ukraine.

The Danube Delta receives inputs from the large catchment of the Danube, the most international river in the world. Preserving its ecosystem, while trying to ensure a sustainable social and economic development of this area, one of the poorest of Europe, requires careful monitoring and management.

CERTO in the Danube Delta

The CERTO project has developed an innovative water quality monitoring system for the complex aquatic environments of the Danube Delta.

Radiometers installed on research vessels measure light reflecting off the water to characterise these optically complex waters. Combined with *in situ* sampling, satellite data, and historical records, this provides a comprehensive understanding of spatial and seasonal variations in water quality across the delta's diverse lakes, lagoons, and coastal waters.

This unique database, tailored to the needs of regional users, advances knowledge of the dynamics of these ecosystems. By integrating multiple data sources, CERTO delivers reliable water quality information to address environmental challenges in the Danube Delta and the Black Sea.

“The data visualisation portal is an indispensable tool for our work. It allows us to easily assess suspended sediment transport even in the delta's smallest, most remote channels.”

*Bogdan Bulete, Danube Delta
Biosphere Reserve Administration*

Benefits

For regulatory authorities:

- Enhanced water quality monitoring
- Open access to near-real-time satellite data
- Early detection of harmful elements, such as algal blooms
- Ensure clean, safe waters for local inhabitants and to sustain growing tourism
- Inform policy decisions for sustainable development and environmental management

For companies:

- Increase knowledge for business development

For local residents:

- Assurance of clean water for recreation
- Protection of the natural environment
- Fosters sustainable tourism and the local economy
- Open access to environmental data

For researchers:

- Enhanced knowledge of environmental management tools, with a focus on Copernicus data





What is CERTO?

CERTO (Copernicus Evolution - Research for harmonised and Transitional water Observation) is an EU Horizon-2020 project that aims to improve water quality monitoring in support of EU directives. The project brings together industry, monitoring agencies, and scientists to develop innovative cross-cutting indicators that can be applied to coastal, transitional, and inland waters. By integrating *in situ* sampling, satellite data, and historical records, CERTO advances water quality data collection and interpretation across diverse aquatic environments.

Advancing water quality monitoring

The CERTO project has advanced water quality monitoring through innovative use of water colour data from the Copernicus satellites. By categorising water types based on optical signatures, CERTO has significantly improved water quality assessment. This approach, currently being used across six European estuaries, has the potential to extend globally, creating a comprehensive network of water monitoring.

CERTO is progressing water quality monitoring by offering near-real-time and on-request data through its portal. It meets the immediate needs of researchers and stakeholders while enriching the pool of assessment tools with new indicators for more accurate and precise evaluations. CERTO contributes to scientific inquiry through shared insights in publications, continually informing and enhancing practices in water quality monitoring.



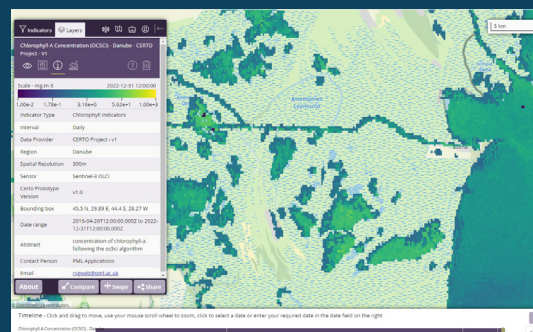
The Sulina anticyclonic current seen from the Sentinel 2 satellite.

The CERTO data portal

CERTO has created a prototype system, designed to integrate seamlessly with existing Copernicus services. This innovative system demonstrates the potential to enhance and expand Copernicus services and their broader impact.

CERTO data can be accessed through a dedicated data visualisation portal, providing up-to-date information and crucial insights into water quality. This offers near-real-time data in an easy to access format.

Whether you're conducting scholarly research, supporting environmental initiatives, or seeking knowledge about the state of local water systems, the portal is a valuable resource that enables active participation in water quality monitoring and conservation efforts.



*The CERTO data visualisation portal:
<https://engage.certoproject.org/data/>*



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