

1 Description:

Earth Observation Products Developed by RSS

As part of the OurMED initiative, Remote Sensing Solutions GmbH (RSS) developed a suite of Earth Observation products to support integrated wetland monitoring and water resource management across nine pilot sites in the Mediterranean region. These products provide spatially and temporally detailed insights into key environmental indicators and are organized per site to support targeted analysis.

- **Surface Water Dynamics**

This product maps the presence and variability of surface water using Sentinel-1 radar data at 10m resolution. It includes three-period summaries of water occurrence percentage (2016–2018, 2019–2021, 2022–2024) as well as monthly surface water occurrence data reflecting the presence or absence of water to capture both seasonal patterns and long-term trends. It enables stakeholders to assess wetland dynamics, manage water availability, and monitor the impact of climate and land use changes on aquatic ecosystems.

- **Water Quality**

Based on Sentinel-3 data (300m resolution, 10-day intervals), this product monitors turbidity, trophic state, and lake surface water temperature for large lakes across the Mediterranean. The outputs are delivered as raster datasets alongside site-specific timeseries plots and statistical summaries. These indicators are crucial for tracking eutrophication, managing pollution, and assessing ecosystem health.

- **Drought Hazard Modelling**

A drought hazard modelling framework provides monthly raster layers at 1 km spatial resolution, assessing drought risk across Tunisia. The modelling integrates satellite-derived variables such as Land Surface Temperature (LST), Normalized Difference Vegetation Index (NDVI), and Normalized Difference Infrared Index (NDII) from MODIS and Sentinel-3, alongside rainfall data from TAMSAT, agricultural yield statistics from FAOSTAT, and land cover data from Copernicus. The result is a robust, multi-source indicator of drought hazard conditions. This product is designed to help agricultural planners, disaster risk managers, and national authorities anticipate and respond to drought impacts, support preparedness strategies, and strengthen long-term resilience in vulnerable areas.

- **European Drought Indicator**

As a complementary product from the European Commission, this 5km resolution indicator (10-day intervals) provides drought status based on precipitation, soil moisture, and vegetation greenness. The product is available from 2012 to 2025 and illustrates the system's potential for regional drought monitoring and early warning across the Mediterranean.

1 Description:

• Forest Dynamics

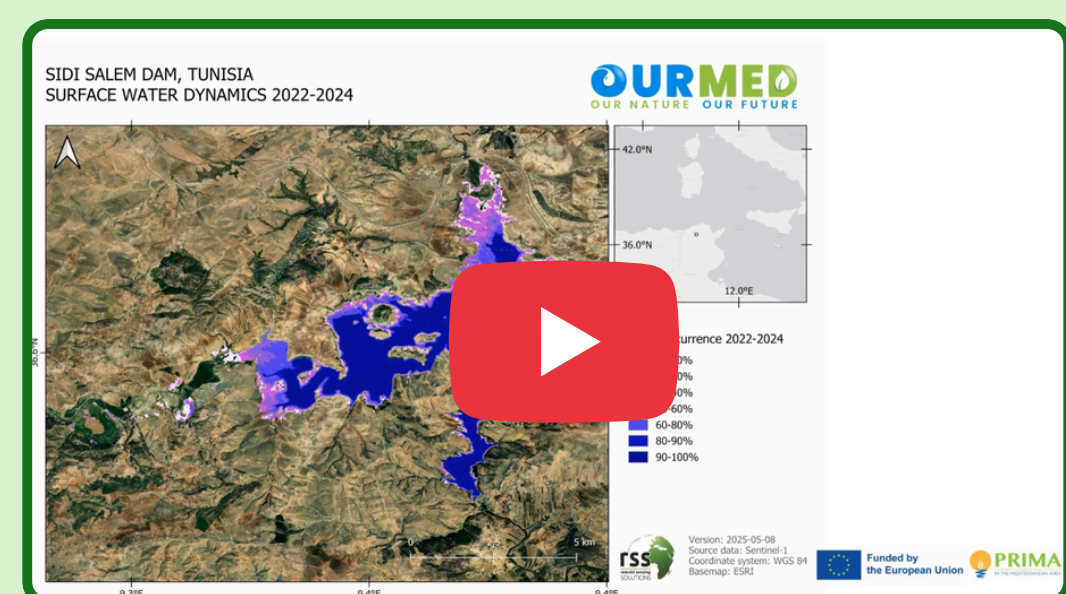
Based on Sentinel-2 data at 10 m resolution, this product delivers yearly assessments of forest health. It includes maps of damaged forest areas and vitality trends from 2016 to 2024 for the Bode site. Additionally, a NDVI change map of the Mediterranean region complements this by highlighting long-term forest condition changes. These layers support forest monitoring, land management, and evaluation of ecological impacts.

• Wetland Use Intensity

This product, also based on Sentinel-2 data (10 m resolution), captures the intensity of land use within wetlands from 2016 to 2024 using the Mean Absolute Spectral Dynamics (MASD) algorithm (Franke et al., 2012). Annual raster layers reflect spectral variability linked to agricultural pressure or disturbance. WUI provides insight into wetland use and pressures beyond conventional land cover mapping, helping identify areas at risk of degradation.

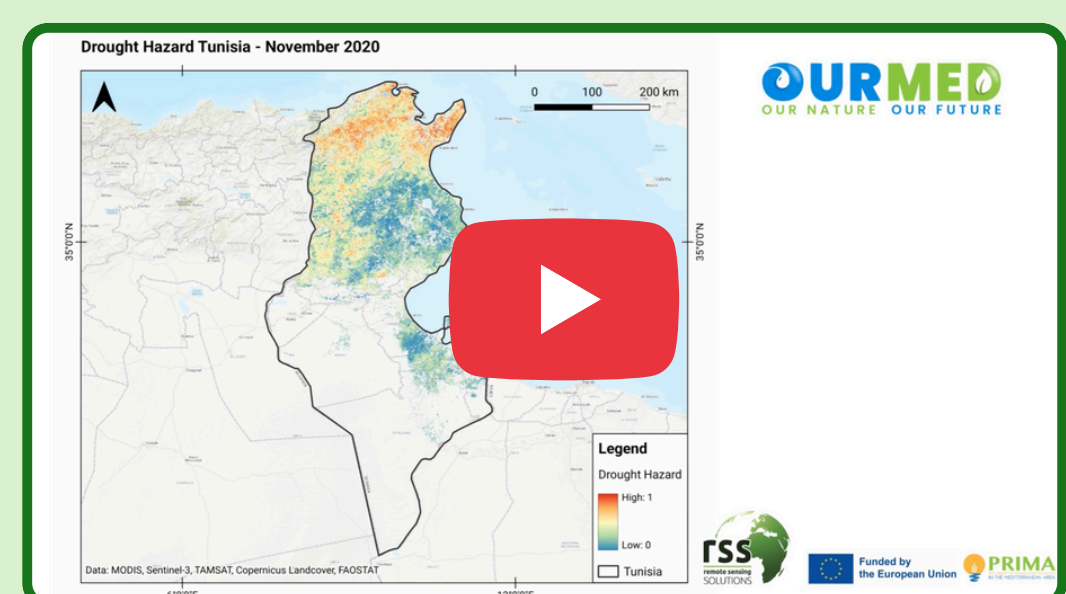
2 Video / image:

Click here



Surface Water Dynamics in the Sidi Salem Dam, Tunisia (2016–2024)

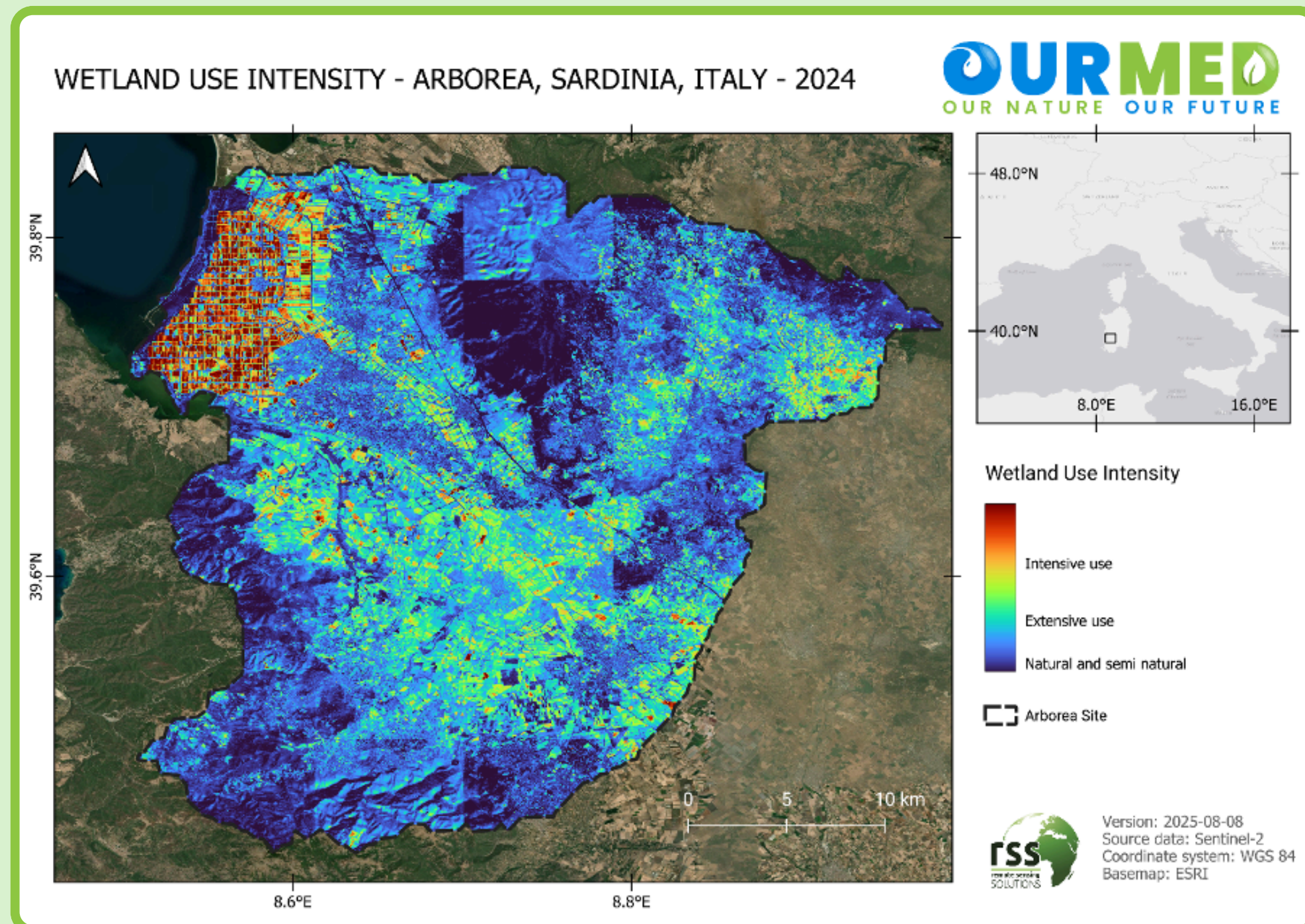
Click here



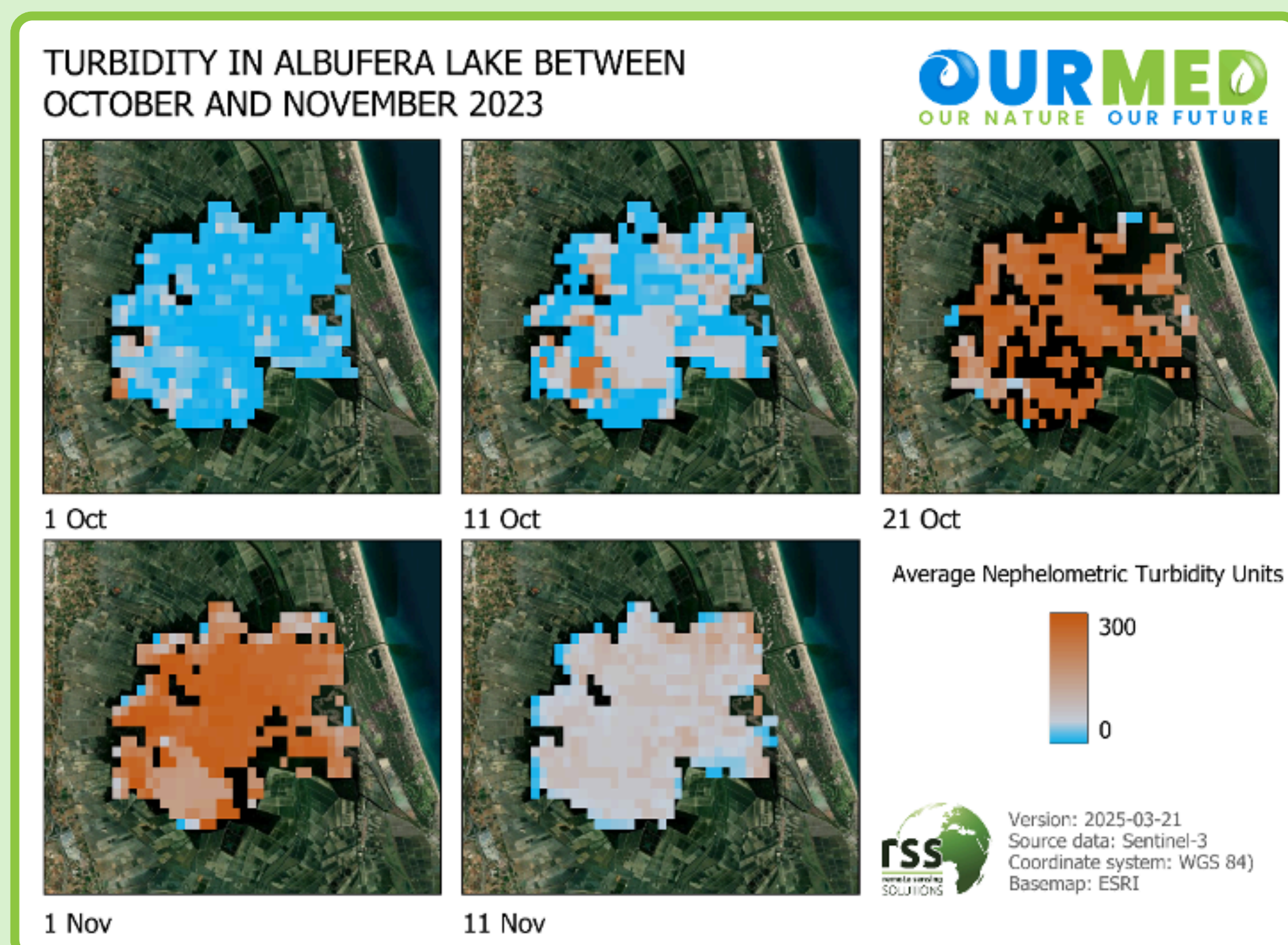
Assessing Drought Hazards in Tunisia, 2020–2024

2 Video / image:

Wetland use intensity – Arborea, Italy:

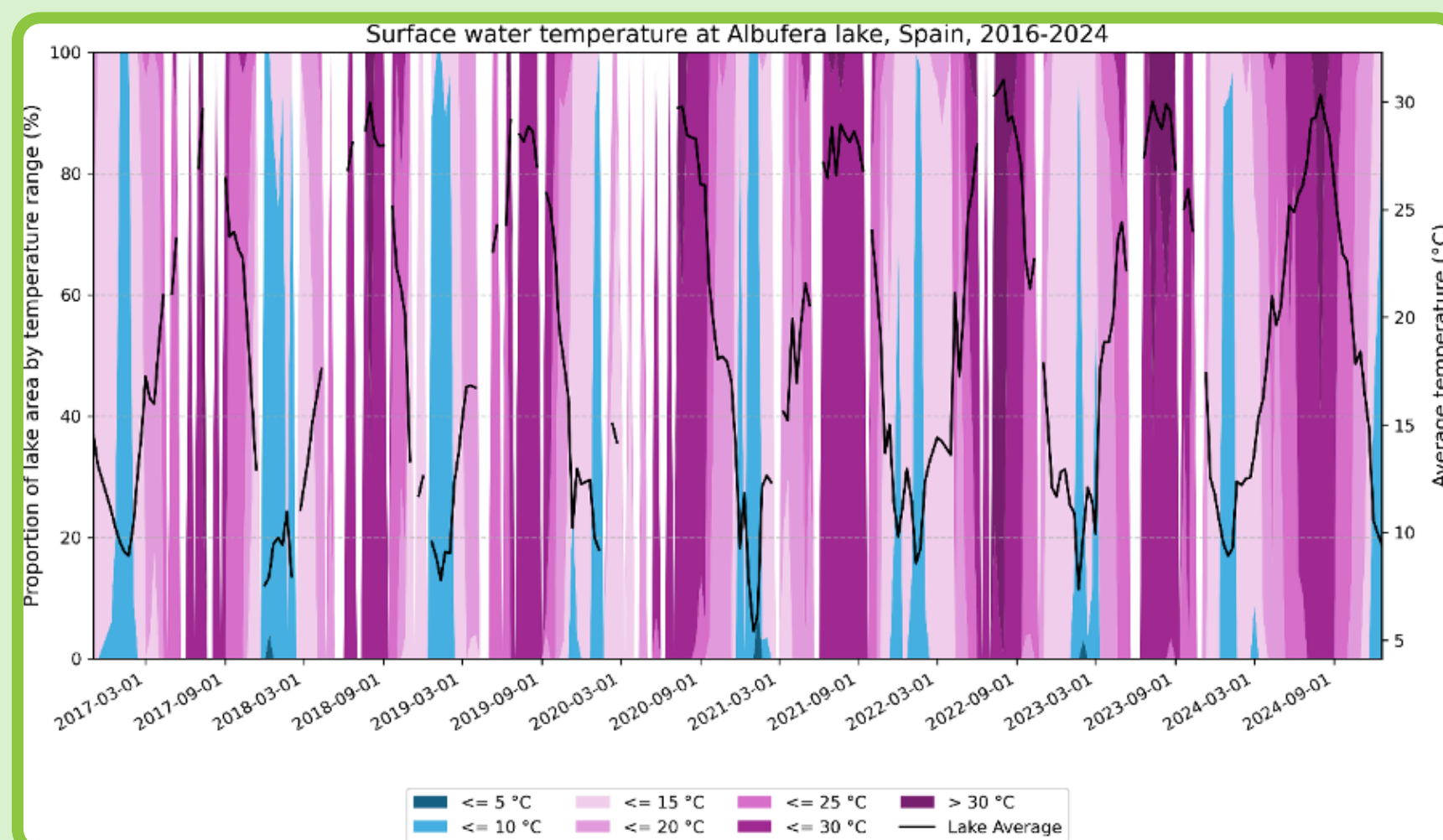
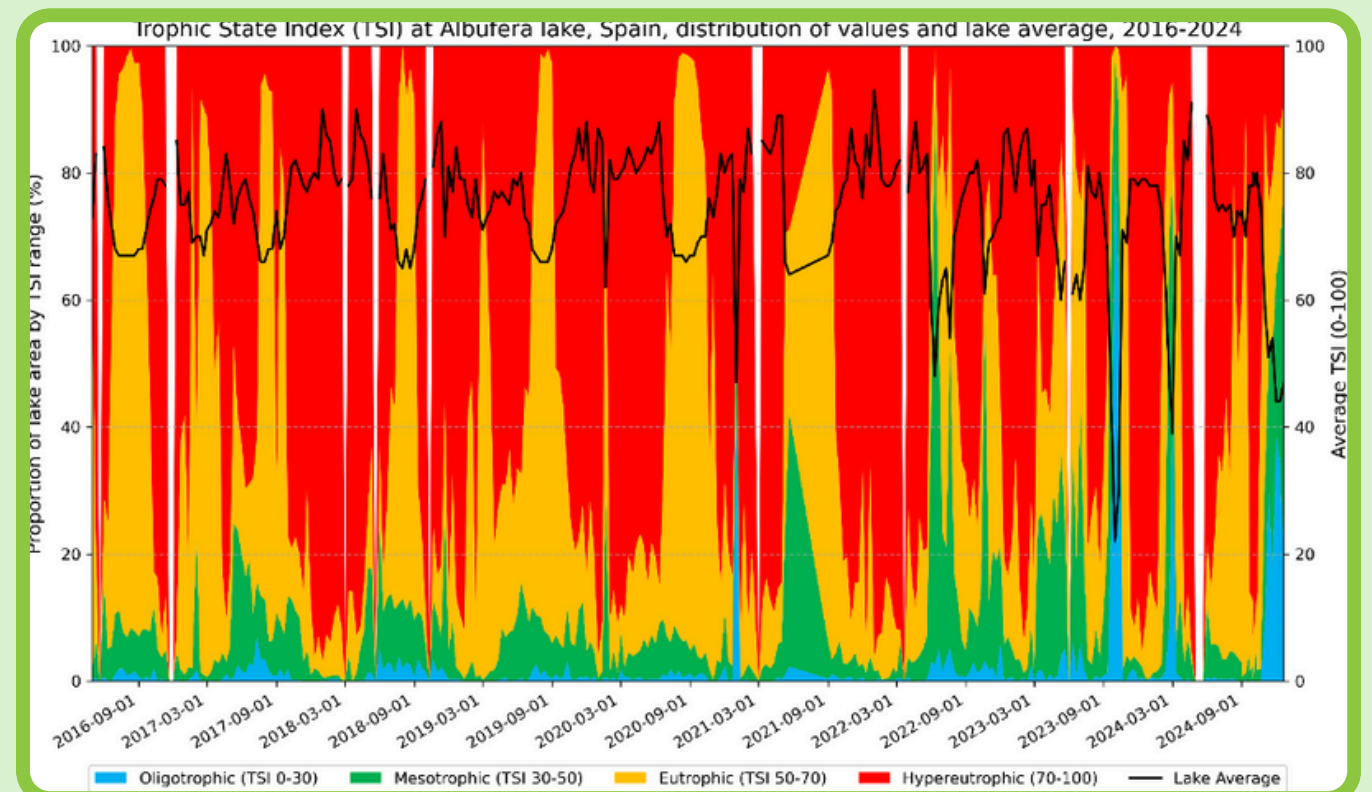
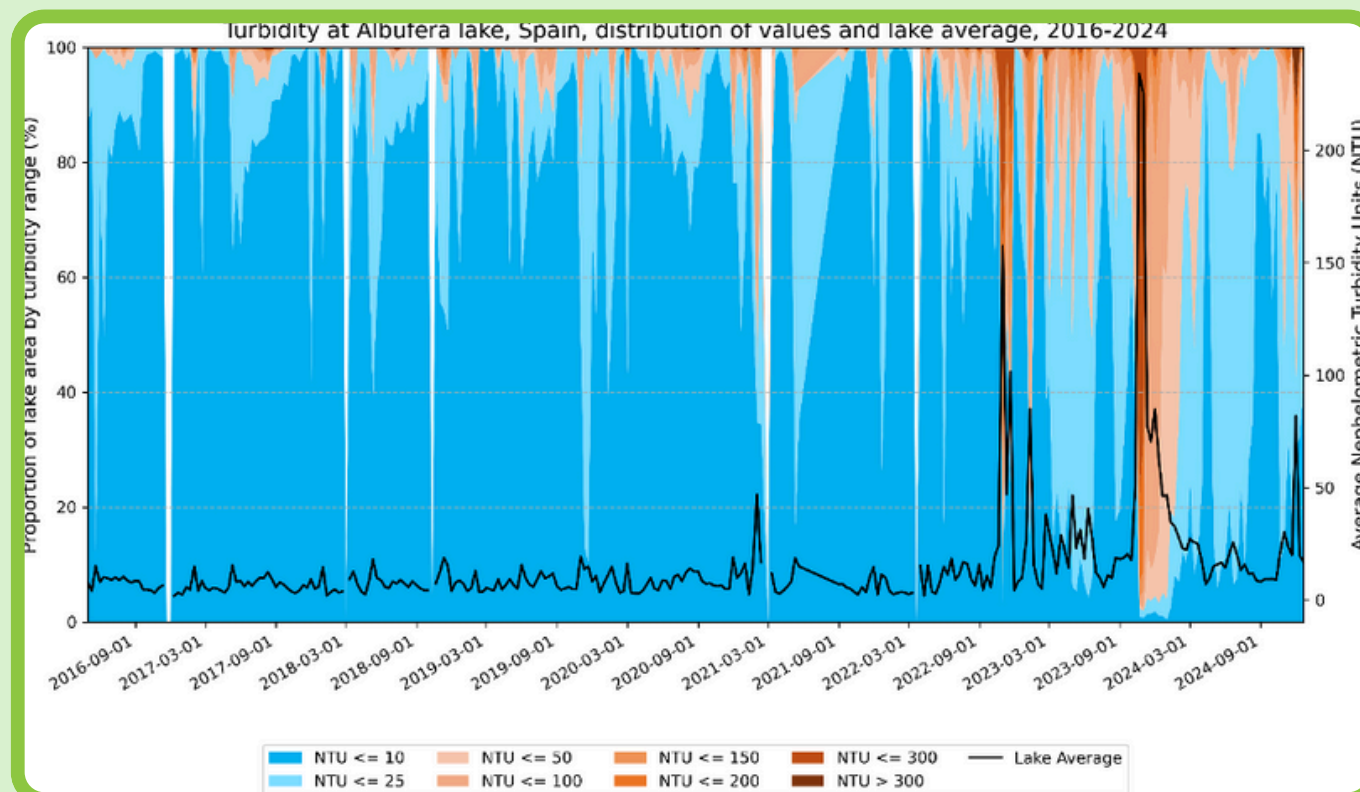


Water quality – Jucar, Albufera Lake, Spain:

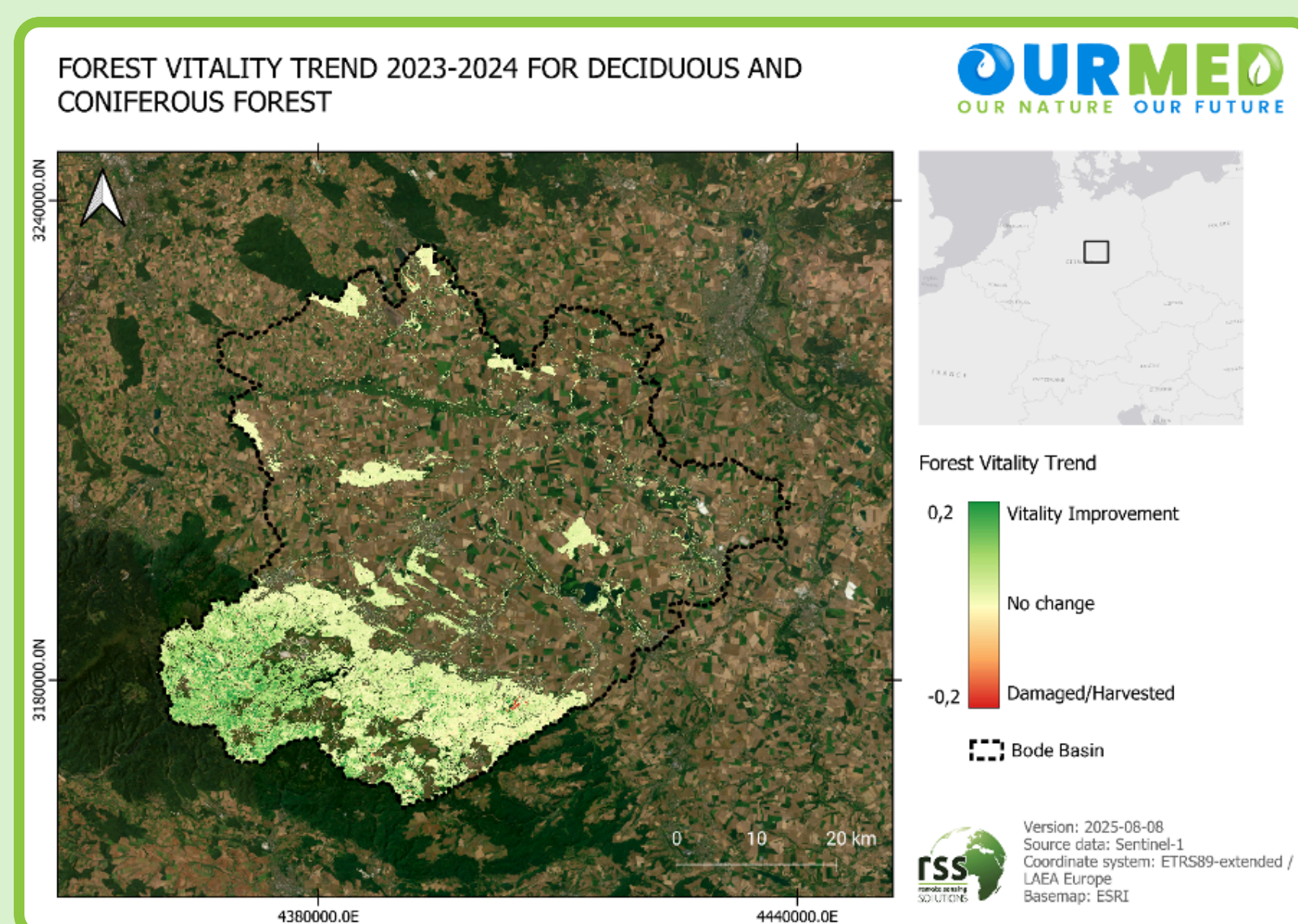


2 Video / image:

Water quality – Jucar, Albufera Lake, Spain:

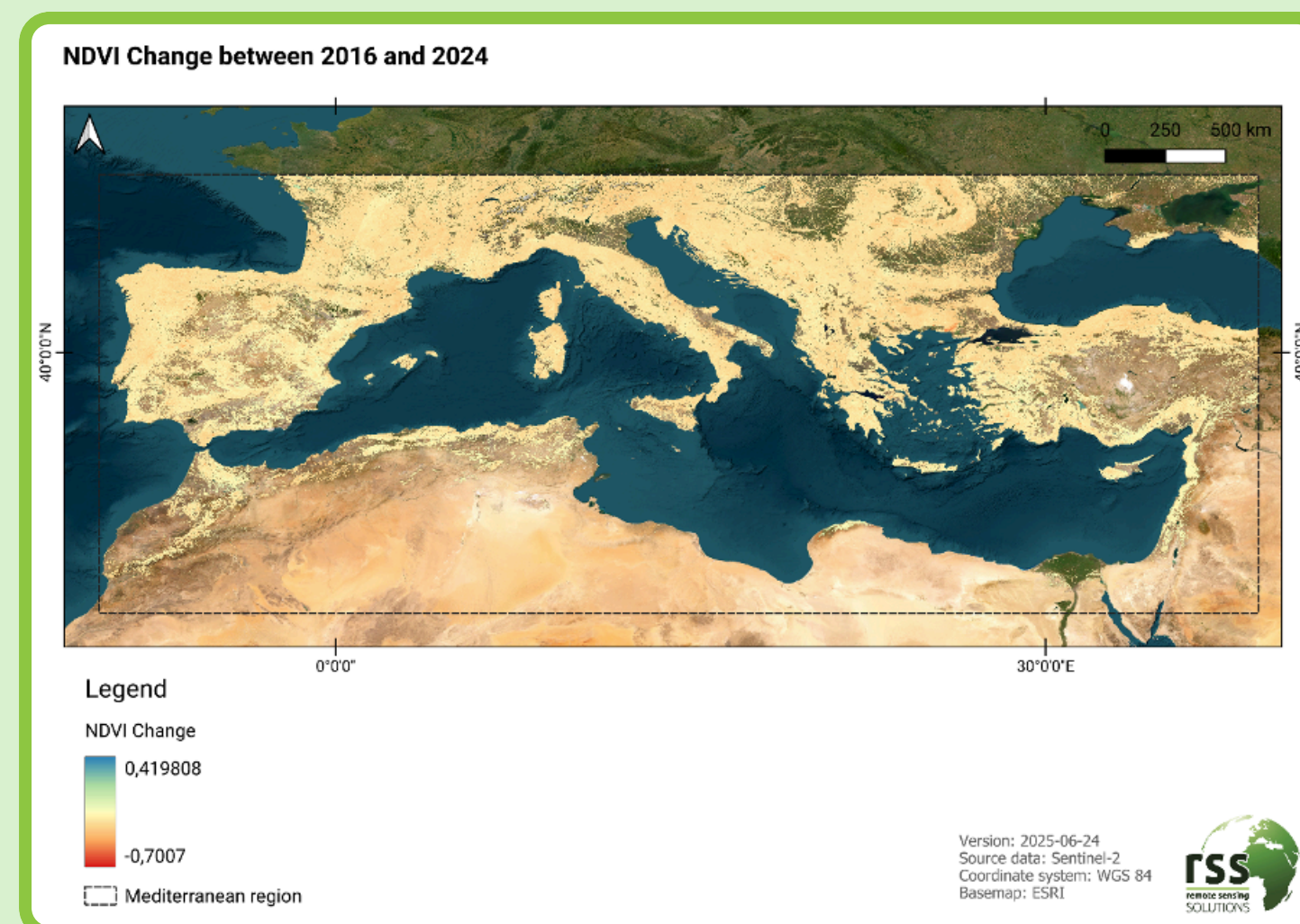


Forest vitality trend 2023-2024 – Bode, Germany:

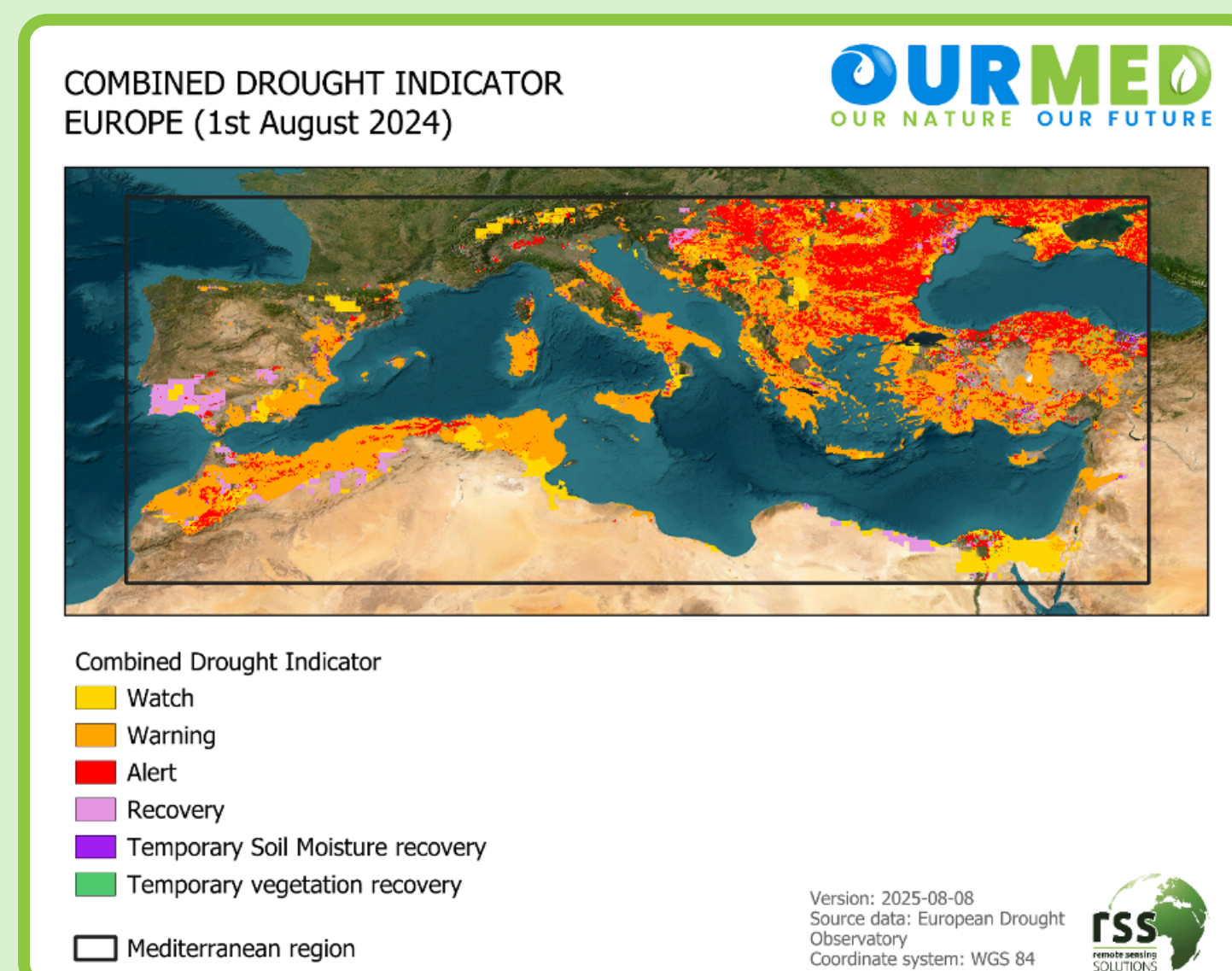


2 Video / image:

Vegetation Dynamics in the Mediterranean: NDVI Change between 2016 and 2024:



Combined Drought Indicator in the Mediterranean – August 2024:



3 Competitive advantages:

RSS's Earth Observation products, integrated within the OurMED initiative, offer a powerful competitive advantage by combining high-resolution, multi-sensor satellite data with the project's collaborative, multi-scale approach to water resource management. Together with on-the-ground Living Labs, advanced modeling, and digital twin tools, these products deliver precise, timely, and site-specific insights that support equitable, evidence-based decisions. This synergy enables stakeholders across the Mediterranean to better predict, plan, and adapt to climate and water challenges, strengthening resilience and sustainability for both ecosystems and communities.

4 Target Users:

1. Public authorities and policymakers who depend on reliable Earth observation tools to monitor environmental change, evaluate progress toward climate and biodiversity goals to support the implementation of EU strategies such as the EU Green Deal and water-related policies.
2. Environmental agencies and conservation organizations working to assess wetland health, detect pressures on biodiversity, and support ecosystem restoration through long-term monitoring of water quality, land use intensity, and forest condition.
3. Research institutions and universities conducting applied studies on hydrology, climate adaptation, land degradation, or ecosystem services, and requiring consistent EO data for modelling, validation, and field-based assessments.
Water managers and irrigation authorities seeking operational, spatially explicit data to monitor surface water availability, track drought conditions, and optimize water allocation across agricultural and ecological needs.
4. Agricultural cooperatives, farmer associations, and agribusinesses that require consistent data on water dynamics, drought risk, and land use trends to support climate-resilient farming, guide resource use, and comply with sustainability standards across agricultural landscapes.

5 Quote from a local stakeholder:

The Earth Observation products created by RSS provide critical insights into the current state of water resources in all associated pilot sites. This insight will help stakeholders, such as environmental agencies, public authorities, land managers, and policymakers across the Mediterranean basin better understand the complex and evolving challenges facing wetland ecosystems.

By delivering timely and spatially detailed information, these EO products enable more informed decision-making to support integrated water resource management, improve drought resilience, monitor ecological health, and ensure sustainable use of wetland resources. Ultimately, this will help target initiatives to strengthen food systems, safeguard biodiversity, and enhance climate adaptation efforts in a region highly vulnerable to climate variability and human pressure.

6 Uptake of the Service:

The EO products developed by RSS will be integrated into the MEDWaterHub, a regional platform created under the OurMED project to serve as a shared resource for the entire Mediterranean basin. This integration will ensure that spatially detailed, regularly updated environmental indicators are accessible to a wide network of stakeholders, including policymakers, researchers, and water managers. In parallel, the products will be incorporated into the GOAigua-EWS digital twin platform, enhancing its capacity for real-time monitoring, predictive modeling, and decision support in water resource management. Together, these platforms will enable more effective planning, climate adaptation, and sustainable water governance across diverse ecosystems and user groups in the region.

7 Next Steps:

Building on the initial implementation of RSS's EO products within the OurMED framework, the next phase will focus on engaging directly with pilot site leaders and local stakeholders through targeted workshops. These sessions will provide a platform to present results, gather feedback, and identify specific needs, ensuring that the solutions and products are refined and tailored to each site's unique context. This collaborative process will not only improve the accuracy and usability of the EO outputs but also strengthen stakeholder ownership and capacity to apply them effectively. Continued dialogue and co-development will be key to maximizing the impact of these tools for sustainable water and ecosystem management across the Mediterranean.

8 OurMED Demosite Application & Results:

RSS's EO products have been deployed across multiple OurMED pilot sites, delivering valuable insights into water quality, drought risk, wetland use, and forest health. In Sebou, Medjerda, Konya, and Jucar, high-resolution monitoring of water quality and wetland use has supported targeted ecosystem management, while Medjerda also benefited from drought hazard modeling and surface water dynamics analysis to inform water allocation strategies. Sites such as Mujib, Agia, and Arborea gained new understanding of wetland pressures through use intensity mapping, and Bode combined forest dynamics monitoring with wetland assessments to guide conservation actions. At the Mediterranean regional scale, the integration of the European Drought Indicator, NDVI change mapping, and water quality analysis has provided a powerful overview for cross-border planning and climate resilience efforts.

9 TRL

Technology Readiness Level (TRL) :

Surface Water Dynamics : TRL 7

Water Quality : TRL 6-7

Drought Hazard Model : TRL 8

Forest Dynamics (Forest Monitor Germany) : TRL 9

Wetland Use Intensity : TRL 8-9

Link to the service:

<https://waldmonitor-deutschland.de/>

Owner: Remote Sensing Solutions GmbH

Contact person: Dr. Maximilian Schwarz