Rheticus® Marine: Sentinel and Copernicus data for operative and continuous monitoring of coastal waters and resources

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Overview

- Rheticus® Platform
- Rheticus® Marine Service
- Rheticus® Aquaculture Service
- Rheticus® for the European Regions
- Recommendations
Industry-focused geospatial information are now available by subscription.

What Rheticus Does

From now on satellite-based information are at your fingertips. Simply login to the Web platform and get insightful geo-analytics, maps and alerts over your area of interest. Actionable information from continuous monitoring of Earth’s surface, infrastructures, work sites, urban dynamics or marine coastal areas is ready to assist you in decision-making and operational activities.

Cloud Based

Indicators, maps reports and alerts

Satellite derived information

Subscription based

Backward analysis and continuous update
Data Processing Workflow

Satellite Data → Cloud Architecture Automatic Processing → Info as a Service

Rheticus® is an automatic cloud-based geo-information service platform for Land, Water and Infrastructure monitoring.
Rheticus® Services

UTILITIES
- Oil&Gas, Energy, Mining, Sewerage, District heating, Desalination plants

ENGINEERING
- Airport, Railways, Roads, Tunnels, Dams, Bridges, Subways, Offshore drilling, dredging

FOOD
- Fishing, Aquaculture, Crop yield forecasting, Precision farming

GOVERNMENT
- Masterplan, Illegal crops, Wildfires, Coastal marine environment
Rheticus® Marine

Rheticus® Marine is a geo-information service for the continuous monitoring of coastal seawater quality and marine resources. From now on satellite-based information are at your fingertips.
The main goal of the Marine Strategy Framework Directive is to achieve Good Environmental Status of EU marine waters by 2020.

“*The environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive*”

11 Qualitative Descriptors
Support for EU Member States reporting duties

**Target:** Good Environmental Status

**Descriptor 5:** Eutrophication

**Needs:**
- Identification of homogeneous sea areas
- Yearly evaluation of eutrophication

**Geo-analytics:**
- Chlorophyll
- Temperature
- Transparency
Support for EU Member States reporting duties
Desalination Plants

Target: Algae blooms

Need: real time alerts to plants’ operators about the occurrence of algae blooms

Pilot: United Arab Emirates
Seas and Oceans are drivers for the European economy

Aquaculture has a great potential for
• Sustainable Innovation
• Jobs
• Growth

The new Common Fisheries Policy: sustainability in depth
Aquaculture

Rheticus® Aquaculture provides aquaculture farmers with daily information designed for the optimal management of fish and shellfish farming activities in marine waters. aimed at
Product Length 87% of Optimal Market Size
Dry Weight 60% of Optimal Market Weight
EUGENIUS consists of Earth Observation SMEs group that provides viable market based Earth Observation services in different European regions.

Responsible of the Marine Service Portfolio

Daniela Drimaco – Planetek Italia | Atlantic from Space Workshop | 23-25/01/2019 | Slide 15
Rheticus® Marine within the EUGENIUS Project

EUROPEAN GROUP OF ENTREPRISES FOR A NETWORK OF INFORMATION USING SPACE

Landslide Monitoring
EUGENIUS supports the landslide monitoring. The landslide case.

Water Quality Monitoring
EUGENIUS supports water quality monitoring. The water quality case.

OEnoview Quality Monitoring
Provides the state of the agriculture environment.

Flood Mapping
A dedicated service for local flood monitoring.

Precision Farming in Greece
Monitoring crop status and vigour.

Forest Dynamic Monitoring
A short description goes here.

Urban Growth Monitoring
Quantified expertise for the assessment of territorial development policies.

Urban Dynamic Analytics
EUGENIUS supports urban dynamics monitoring. The urban case.

http://eugenius.planetek.it/
The Water Quality Monitoring provides information about the ecological state of the marine environment through a series of physical parameters. The use of satellite big data and other free and open data sources help detecting and continuously monitoring phenomena over coastal seawaters. The huge availability of data guarantees timely and regular intensive surveys enabling the continuous monitoring of a chosen area of interest. The service provides access to updated valuable information for classifying the status of water areas and infrastructures. The service also fits the needs of national and local authorities as well as fishing companies in terms of marine quality monitoring and preservation.

Physical parameters can be monitored such as:

- Chlorophyll-a(Chl) concentration.
- Total Suspended Matter (TSM).
- Water Transparency/Turbidity (WT).
- Sea Surface Temperature (SST).
The Water Quality Monitoring provides information about the ecological state of the marine environment through a series of physical parameters.

The case of Apulian waters - Gulf of Manfredonia - 2017 August 12

This is the initial situation. Chlorophyll concentration is typically low in the Gulf of Manfredonia (below 10 µg/l), but sometimes such value increase due to waters rich in nutrients from the inland (moderate raining occurred in this day) or for favorable conditions like in summer with high temperatures and low currents. Here the area with higher chlorophyll value is in the western part of the gulf, mainly near the shore.

Gulf of Manfredonia - 2017 August 13
The Water Quality Monitoring provides information about the ecological state of the marine environment through a series of physical parameters.

In the days of the associatedLooking at a region with high temperatures and low currents. Here the area with higher chlorophyll value is in the western part of the gulf, mainly near the shore.

**Gulf of Manfredonia - 2017 August 13**

Local conditions and winds from north west bring higher Chlorophyll (between 0.5 and 1.3 µg/l) eastwards. At 0.5 km spatial resolution a large plume far from the coast can be well distinguished. Furthermore slightly higher Chlorophyll can be seen moving all along the coast towards east.

**Gulf of Manfredonia - 2017 August 14**
Local conditions and winds from north-west bring higher Chlorophyll a between 0.5 and 1.5 μg/l eastwards. At 5km spatial resolution a large plume far from the coast can be well distinguished. Furthermore, slightly higher Chlorophyll a can be seen moving along the coast towards east.

The expansion of the higher Chlorophyll a area towards east continues in the main offshore plume and along the coast. Also, on the western side the higher concentration Chlorophyll a shows some evolutions. In the Sentinel-3 Chlorophyll a map at 300m more details can be seen about the plume, the evolution on the western side and more important, a better evaluation of the increase along the coast is possible. It can be noticed how at 300m resolution the harbor of Bari in the southern part of the image is visible.
The Water Quality Monitoring provides information about the ecological state of the marine environment through a series of physical parameters.

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Chlorophyll values are generally decreasing (values are below 0.5 µg/l), but the drift towards east in the plume and along the coast continues.

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Looking at the 1km map, while the plume almost disappeared, an increase of Chlorophyll can be noticed along the coast from the middle of the plume.
Looking at the **Plume map**, while the plume almost disappeared, an increase of Chlorophyll can be noticed along the coast from the middle of the image towards east, where a small plume is forming around the Bari harbor.

The **Sentinel-2 Chlorophyll map at 10m** gives much more details on this area and also in the western part of the gulf even if a large area is masked due to sun glint which can be really impacting at such spatial scale. The harbor of Bari is well visible here: such high values of Chlorophyll are due to the sum of the effects of high Chlorophyll concentration as confirmed by the map at 1km and of sun glint.
The Water Quality Monitoring provides information about the ecological state of the marine environment through a series of physical parameters.

Looking at the 3km map, while the plume almost disappeared, an increase of Chlorophyll can be noticed along the coast from the middle of the image towards east, where a small plume is forming around the Baris harbor.

The Sentinel-2 Chlorophyll map at 30m gives much more details on this area and also in the western part of the gulf even if a large area is masked due to sun glint which can be really impacting at such spatial scale. The harbor of Baris is well visible here, high values of Chlorophyll due to the sum of the effects of high Chlorophyll concentration as confirmed by the map at 3km end of sun glint.
MARKET SECTOR

Planetek develops services for Coastal and Marine Environment through a proprietary platform called Rheticus®

INTERMEDIATE USER

Planetek is an intermediate user that uses Sentinel data together with Marine Copernicus Service to develop business for the final customers. Main application fields are WFD Reporting, Aquaculture and Desalination Plants

END USERS

We target end users such as national and regional environmental authorities, engineering companies, aquaculture cooperatives
Recommendations

- Support the transition from project/product approach to Info as a Service
- Define vertical services for selected user/market
- Connect with other ESA and European initiatives
- Strengthen the link with relevant Copernicus services (Mercator, EEA, Security)
- Address the issue of involvement of Atlantic users
- Establish permanent relations with relevant actors
- Provide requirements for future missions with a focus on Copernicus Evolution
Let’s keep in touch

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