Rheticus™ Marine Downstream Services

At **Copernicus Marine Service, opportunities for italian sector of Blue Growth workshop**

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planetek italia

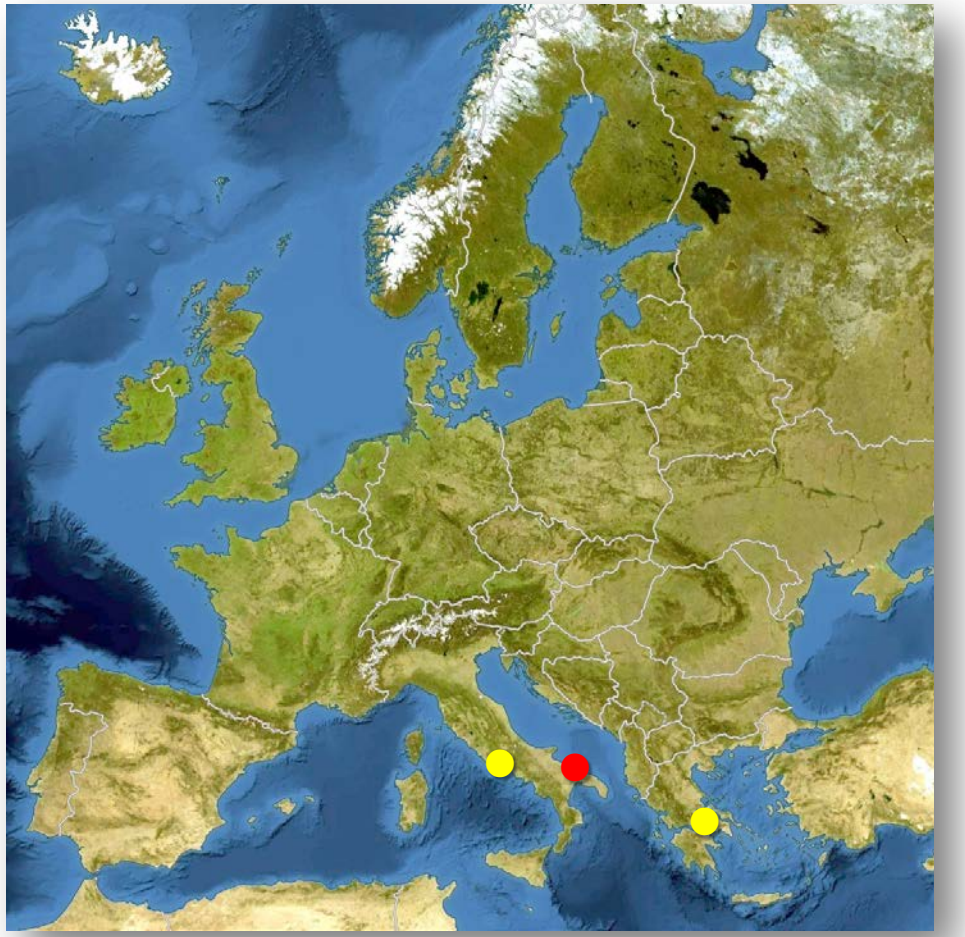
Since 1994…

planetek italia — Bari

planetek hellas — Athens

GEO-K — Roma

LOG — Bari

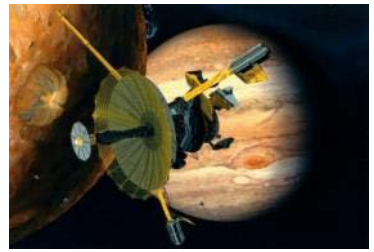


Earth Observation

Spatial Data Infrastructure & GIS

Location Based Systems

Space Software



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Rheticus®

Monitoring the evolution of our Earth

- Cloud-Based
- Subscription-Based
- Satellite Data
- (Geo) Open Data
- Continual Updates
- Analytics, Maps, Reports

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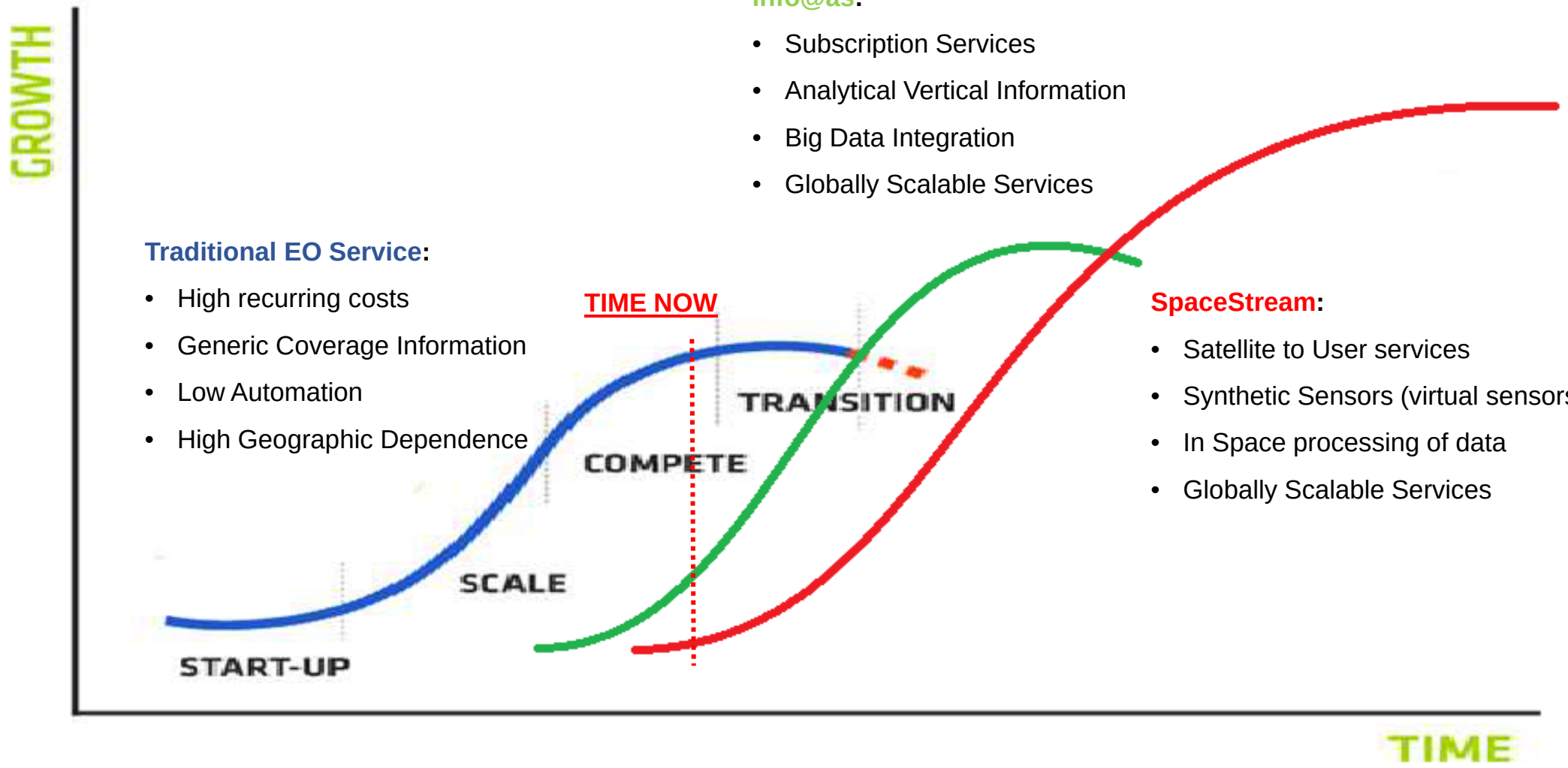
The 3 Horizons of innovation in Planetek

Info@as:

- Subscription Services
- Analytical Vertical Information
- Big Data Integration
- Globally Scalable Services

Traditional EO Service:

- High recurring costs
- Generic Coverage Information
- Low Automation
- High Geographic Dependence



SpaceStream:

- Satellite to User services
- Synthetic Sensors (virtual sensors)
- In Space processing of data
- Globally Scalable Services

From GEO Services to GEO-Analytics

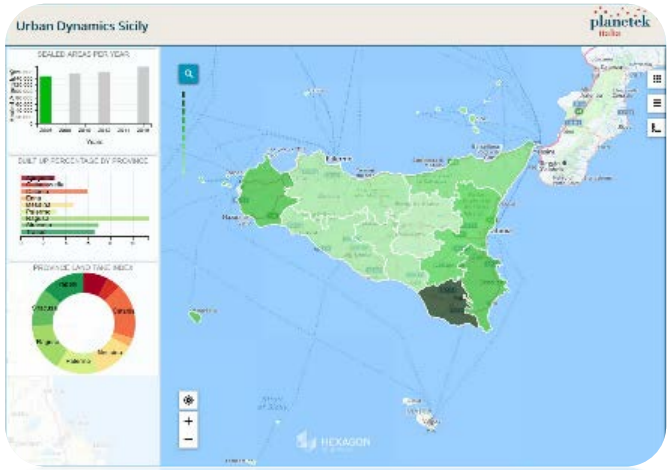
- Planetek Geoanalytics belongs to a long experience in development of Satellite Based Geoservices. These bespoke services where generally project based and with relevant recurring costs.
- Rheticus™ provides info@as services, globally scalable, with low recurrent costs.
- Rethicus™ will benefit from dat@as and s@as provided by DIAS

Rheticus®: Data Processing Workflow

Satellite Data

Automatic Processing

Info as a Service



Rheticus® is an automatic cloud-based geo-information service platform for land, water and infrastructure monitoring

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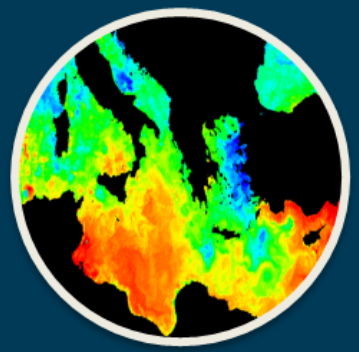
Displacement

- Landslides
- Subsidence
- Infrastructure Stability



Marine

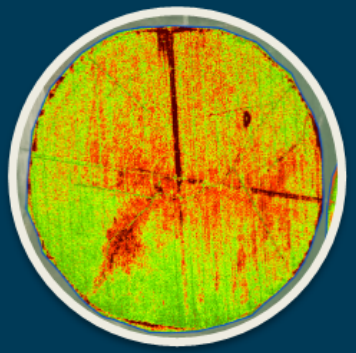
- Water Quality
- Algae Bloom
- Aquaculture
- Fishing

Land

- Land Cover
- Wildfires

Urban Dynamics

- Urban Changes
- Urban Heat Islands
- Soil Sealing
- Infrastructures



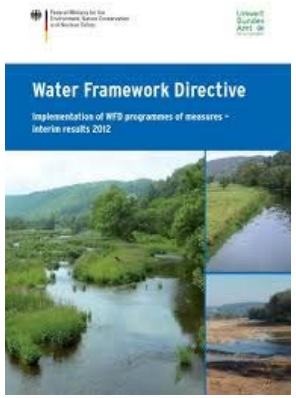
Agriculture

- Crop Monitoring
- Vegetation Heath
- Yield Estimation
- Illegal Crops

Rheticus Services

European Directives on coastal areas

- ✓ **Water Framework Directive (WFD)**
- ✓ **Marine Strategy Framework Directive (MSFD)**
- ✓ **Recommendation on Integrated Coastal Zone Management**
- ✓ **Bathing Water, Habitats (Natura2000), …**



WFD: Good Status for all EU surface and groundwaters by 2015. 2027 final deadline for meeting objectives

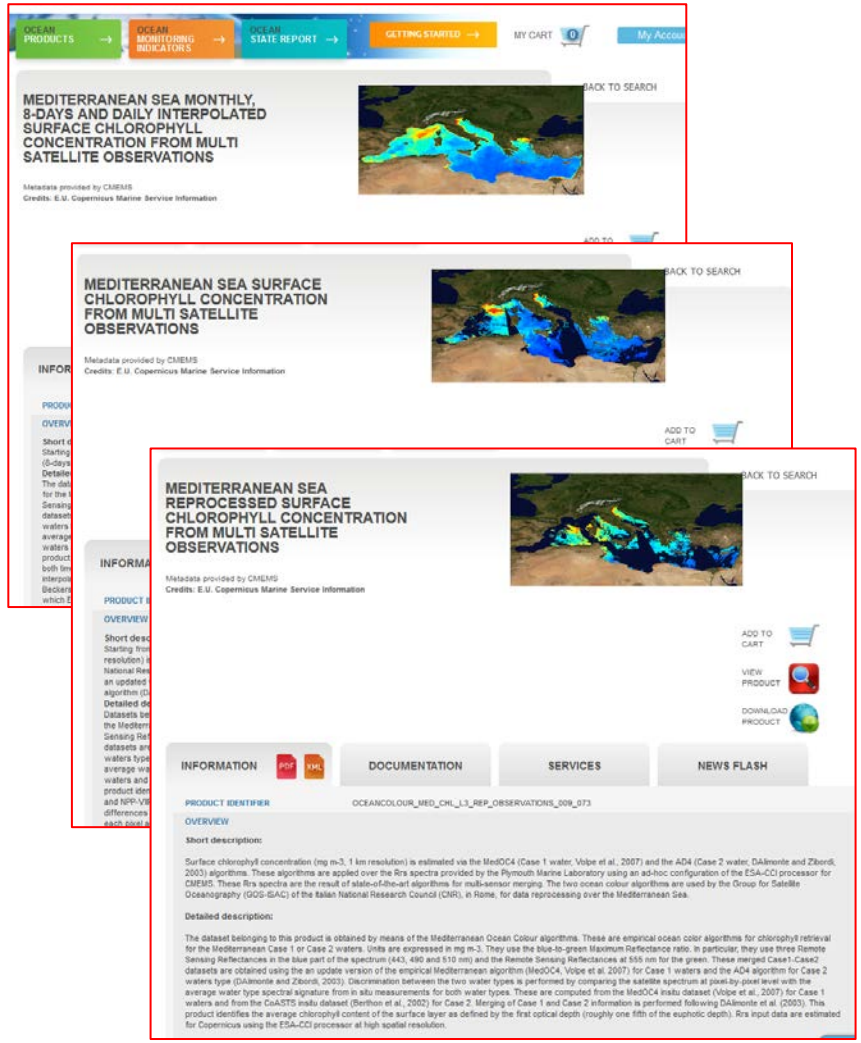
MSFD: Good Environmental Status of EU marine waters by 2020

Use case for WFD and MSFD reporting

- Definition of relevant zones
  - Using long-term historical CMEMS measurements (e.g. Chlorophyll, Derived transparency, Temperature, Salinity, etc.)
  - Using input information from user
- Extraction of geo-analytics and indicators over relevant zones and relevant time periods (e.g. monthly, yearly, etc.)
  - Water parameters made available by CMEMS as support of WFD indicators or e.g. MSFD descriptor 5 (eutrophication)
- Synthesis tables for reporting

CMEMS useful products

- Measurements available in CMEMS:
  - Parameters from satellites at 1km spatial resolution: Chlorophyll, Temperature, optical properties
  - Other useful parameters from modelling + satellites at 4-16km spatial resolution: Salinity, Dissolved Oxygen, Primary production
- Historical maps: daily and monthly
- Ongoing mapping: daily, including hole-filled (L4) measurements



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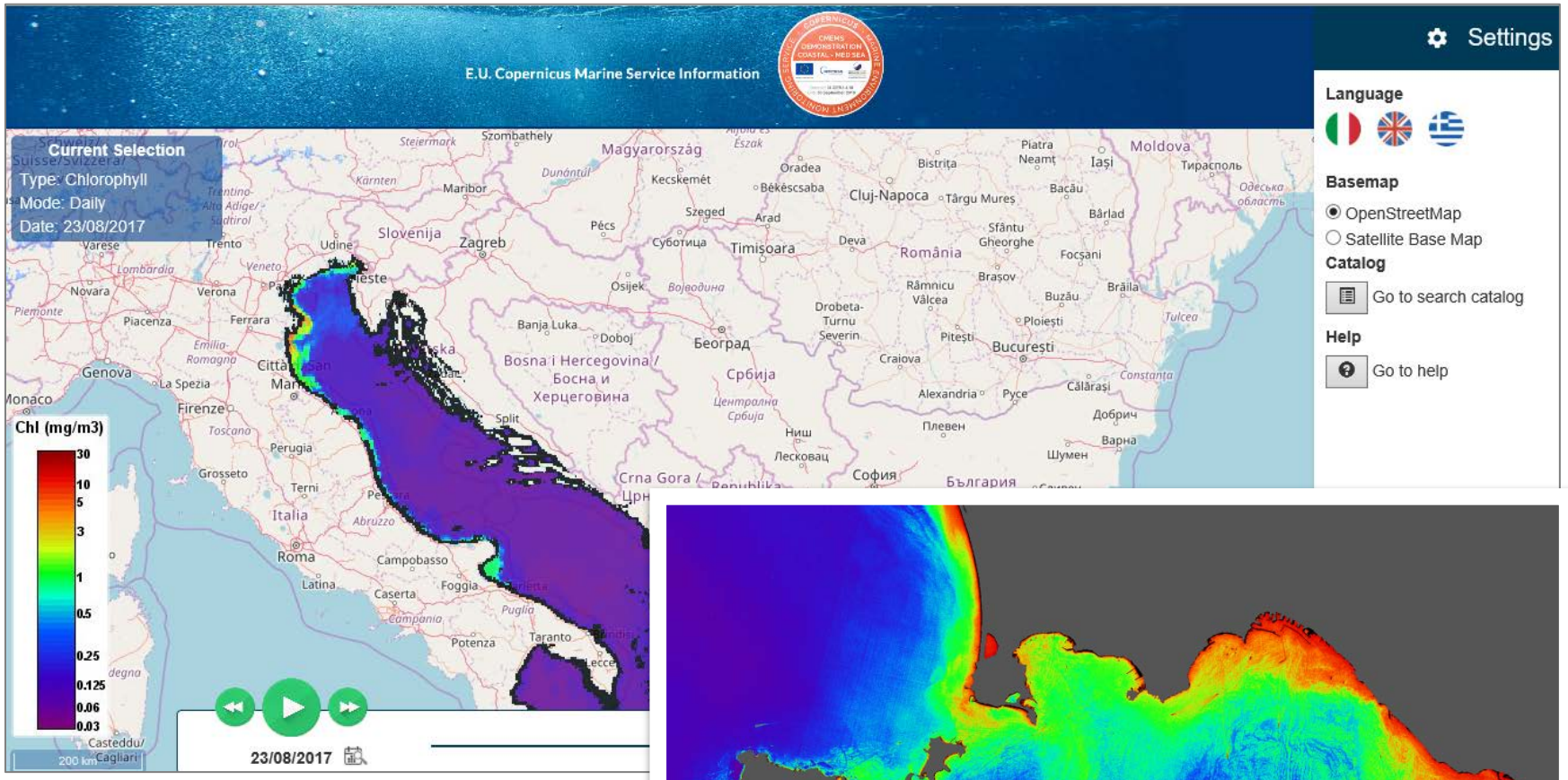
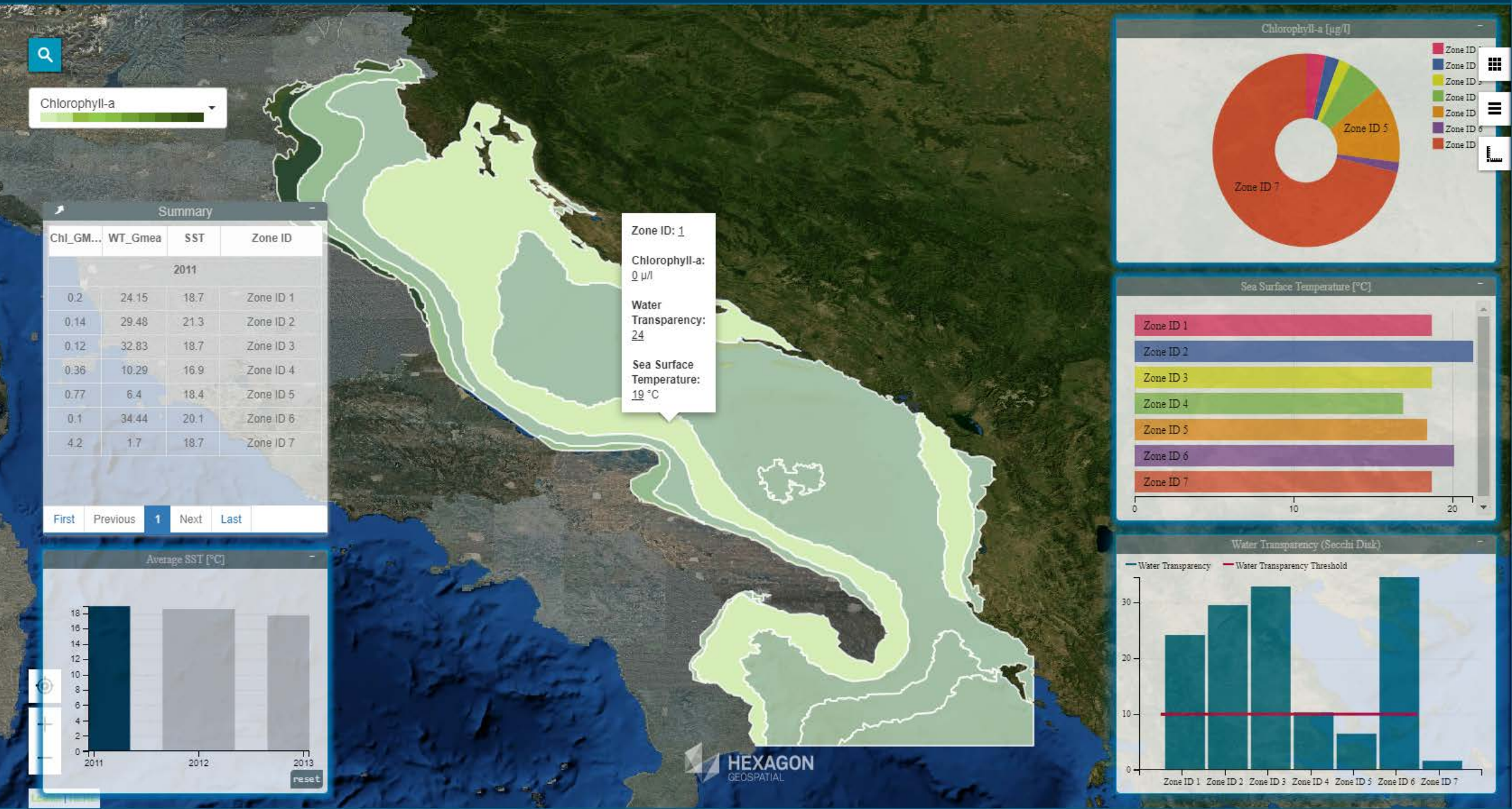
Rheticus Marine

Users can access the web interface based on Rheticus™ Marine, search and browse products metadata, display them on a map and download them as well.

Users can also request statistical calculations on demand over pre-set temporal periods within a pre-defined selection window.





Summary

Chl_GM...	WT_Gmea	SST	Zone ID
2011			
0.2	24.15	18.7	Zone ID 1
0.14	29.48	21.3	Zone ID 2
0.12	32.83	18.7	Zone ID 3
0.36	10.29	16.9	Zone ID 4
0.77	6.4	18.4	Zone ID 5
0.1	34.44	20.1	Zone ID 6
4.2	1.7	18.7	Zone ID 7

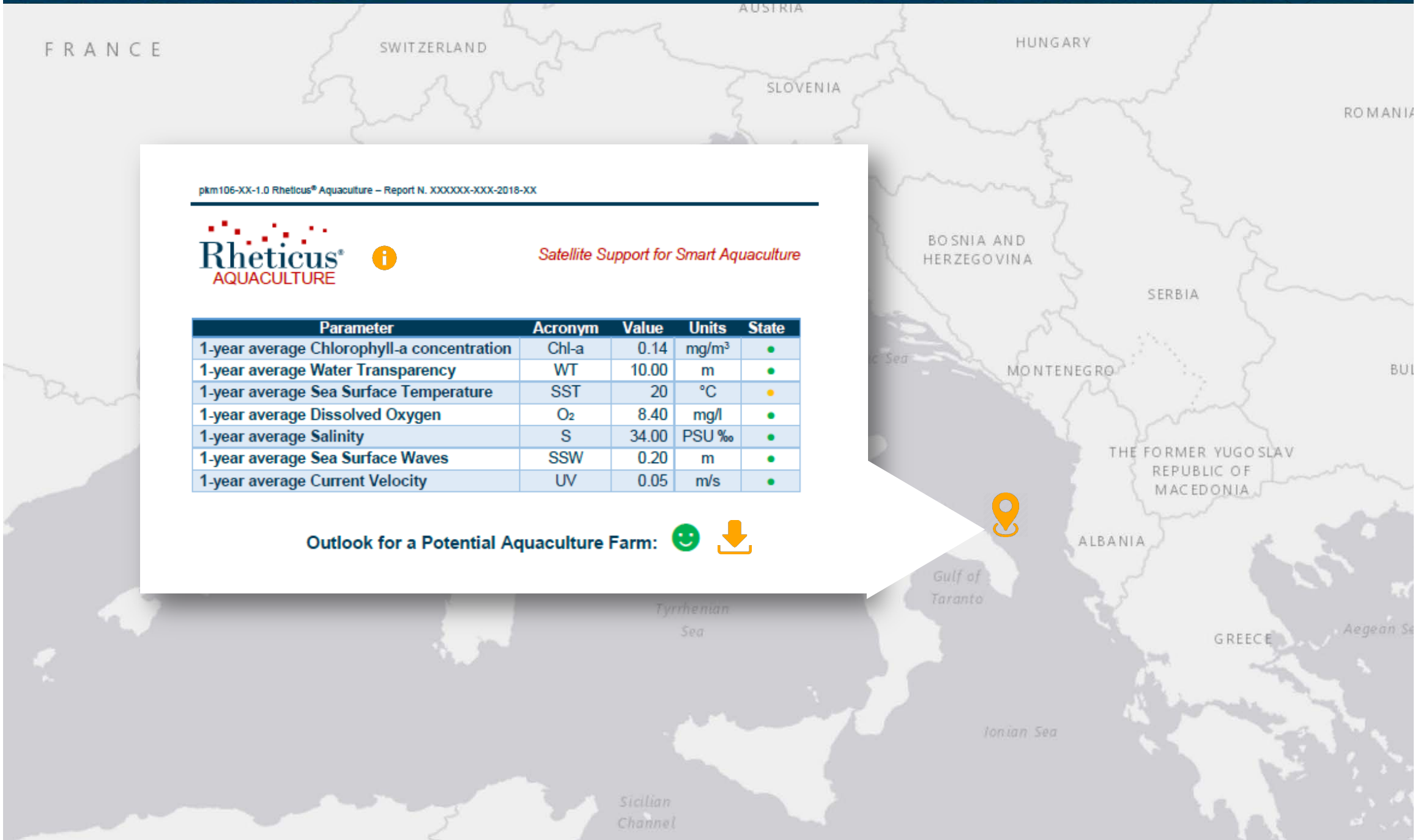
First Previous 1 Next Last

Average SST [°C]

Chlorophyll-a [µg/l]

Sea Surface Temperature [°C]

Water Transparency (Secchi Disk)



pkm106-XX-1.0 Rheticus® Aquaculture – Report N. XXXXXX-XXX-2018-XX

Rheticus® AQUACULTURE

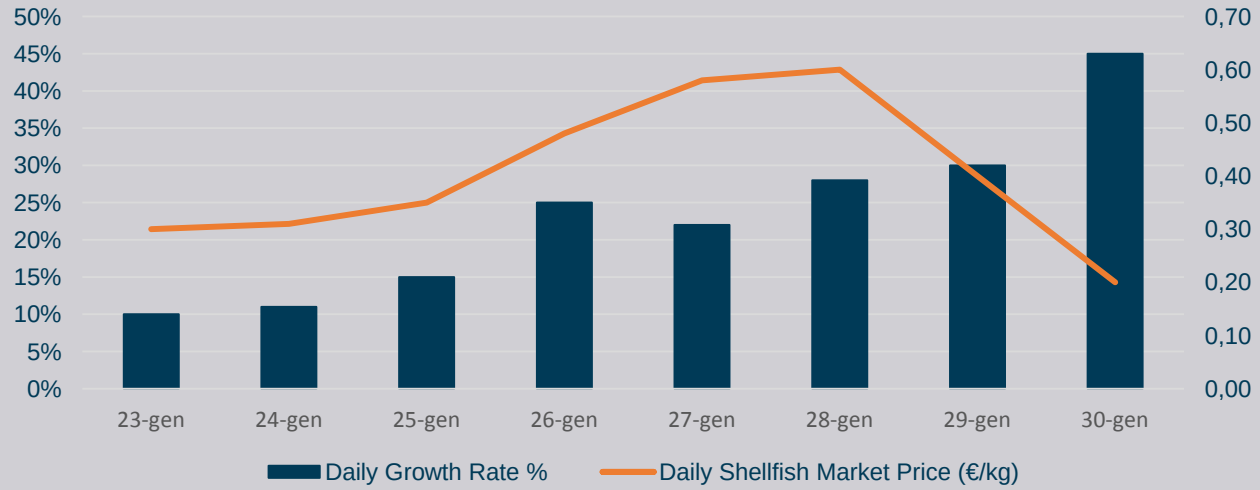
Satellite Support for Smart Aquaculture

Parameter	Acronym	Value	Units	State
1-year average Chlorophyll-a concentration	Chl-a	0.14	mg/m³	●
1-year average Water Transparency	WT	10.00	m	●
1-year average Sea Surface Temperature	SST	20	°C	●
1-year average Dissolved Oxygen	O_2	8.40	mg/l	●
1-year average Salinity	S	34.00	PSU ‰	●
1-year average Sea Surface Waves	SSW	0.20	m	●
1-year average Current Velocity	UV	0.05	m/s	●

Outlook for a Potential Aquaculture Farm:

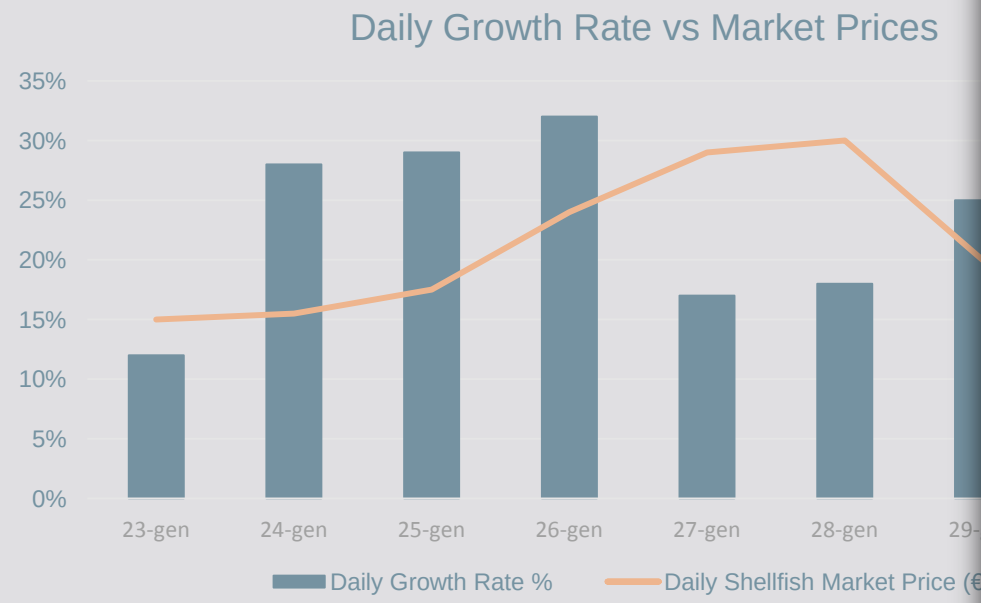
Daily Growth Rate vs Market Prices

as of 23/01/2018 at 10:00 UTM



Parameter	Acronym	Value	Units	State
Chlorophyll-a	Chl-a	0.14	mg/m^3	●
Water Transparency	WT	10.00	m	●
Sea Surface Temperature	SST	20	°C	●
Dissolved Oxygen	O_2	3.00	mg/l	●
Salinity	S	34.00	PSU ‰	●
Sea Surface Waves	SSW	0.20	m	●
Current Velocity	UV	0.25	m/s	●
Product Growth Rate		22	%	●
Days to Market Size		10	day(s)	●
Storm Surge Alert		--		●
Average Weekly Shellfish Market Price Source: ISMEA Mercati		0.58	€/kg	▲
Outlook for Risky Situations		Low		●

Ancona



Ancona

Parameter	Acronym	Value
Chlorophyll-a	Chl-a	0.14
Water Transparency	WT	10.00
Sea Surface Temperature	SST	20
Dissolved Oxygen	O_2	3.00
Salinity	S	34.00
Sea Surface Waves	SSW	0.20
Current Velocity	UV	0.25
Product Growth Rate		22
Days to Market Size		10
Storm Surge Alert		--
Average Weekly Shellfish Market Price Source: ISMEA Mercati		0.58
Outlook for Risky Situations		Low

My Content Area

- PDF Report 12 43 46
- PDF Report 13 57 49
- PDF Report 17 50 39
- PDF Report 17 50 39
- PDF Report 12 13 46
- PDF Report 12 43 46
- PDF Report 13 57 49
- PDF Report 17 50 39
- PDF Report 17 50 39

Expected Evolution of Marine Services

- Core data not available near the coast (usually within a distance of 2km from the shoreline)
- Spatial resolution required <1km
- A more seamless M2M interface to generate downstream services on the cloud

The evolution: The algal bloom service

A new service will be distributed by Rheticus, based on the results of the **HABRisk** project.
This project will start soon this year as result of a proposal awarded in the frame of 67-UU-DO-CMEMS-DEM4 tender from a consortium led by I-Sea.

Analysis of the coastal soil sealing