

Commercial satellite supported maritime and water monitoring services, and their co-existence with public space initiatives

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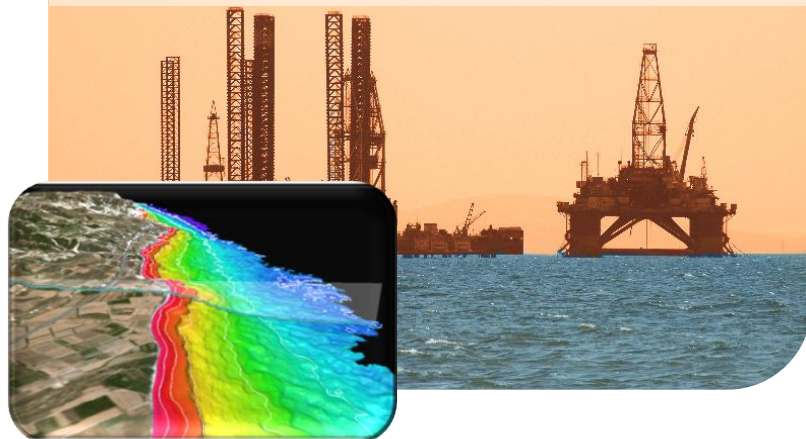


Content

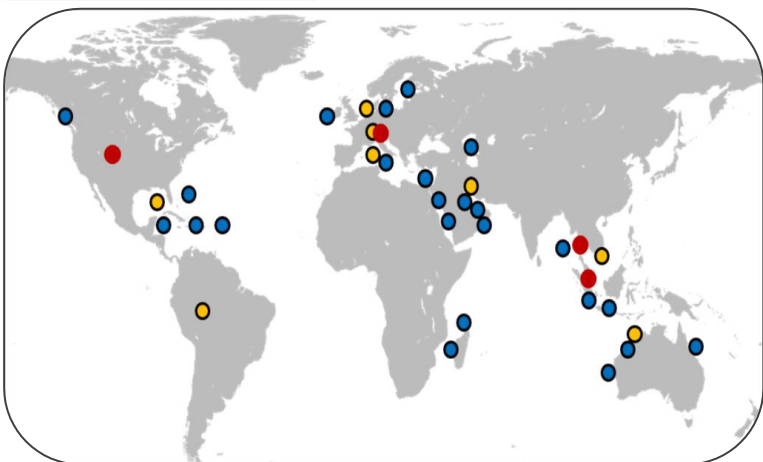
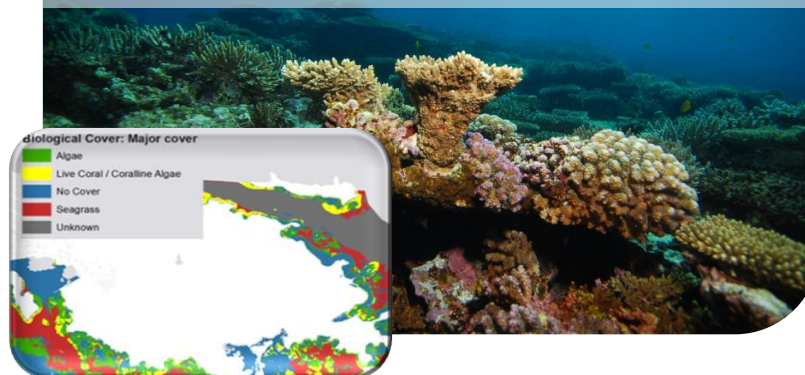
- Applications for EO maritime and water monitoring services
- Public and commercial initiatives to foster EO services
- Mechanisms creating economic values

EOMAP core business: aquatic mapping services

Bathymetry surveys for offshore industry



Environmental monitoring of coastal zones for offshore industry & agencies

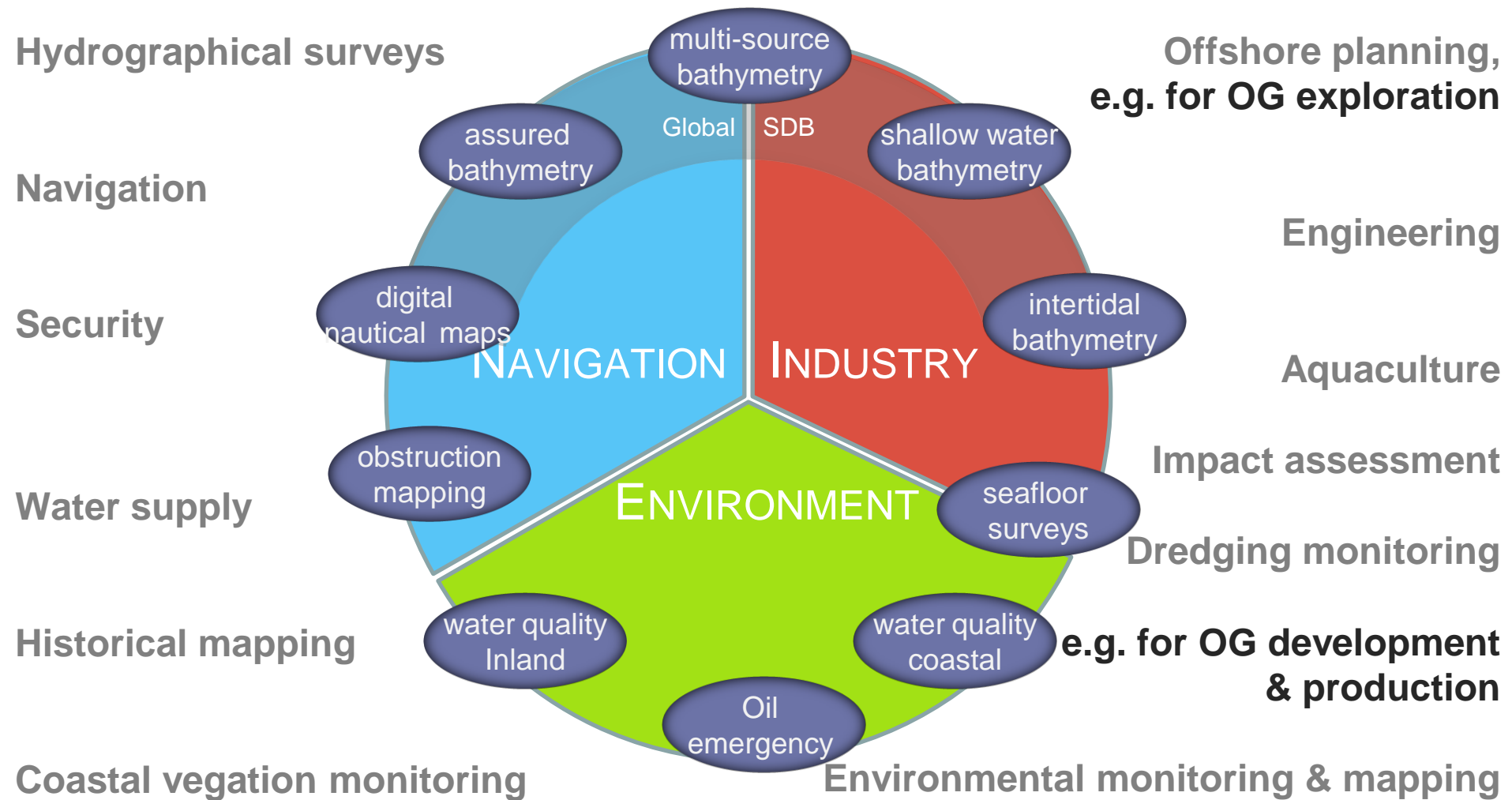


Worldwide distribution and services

Water quality monitoring for agencies and authorities



Satellite derived products and services for aquatic applications in three vertical sectors

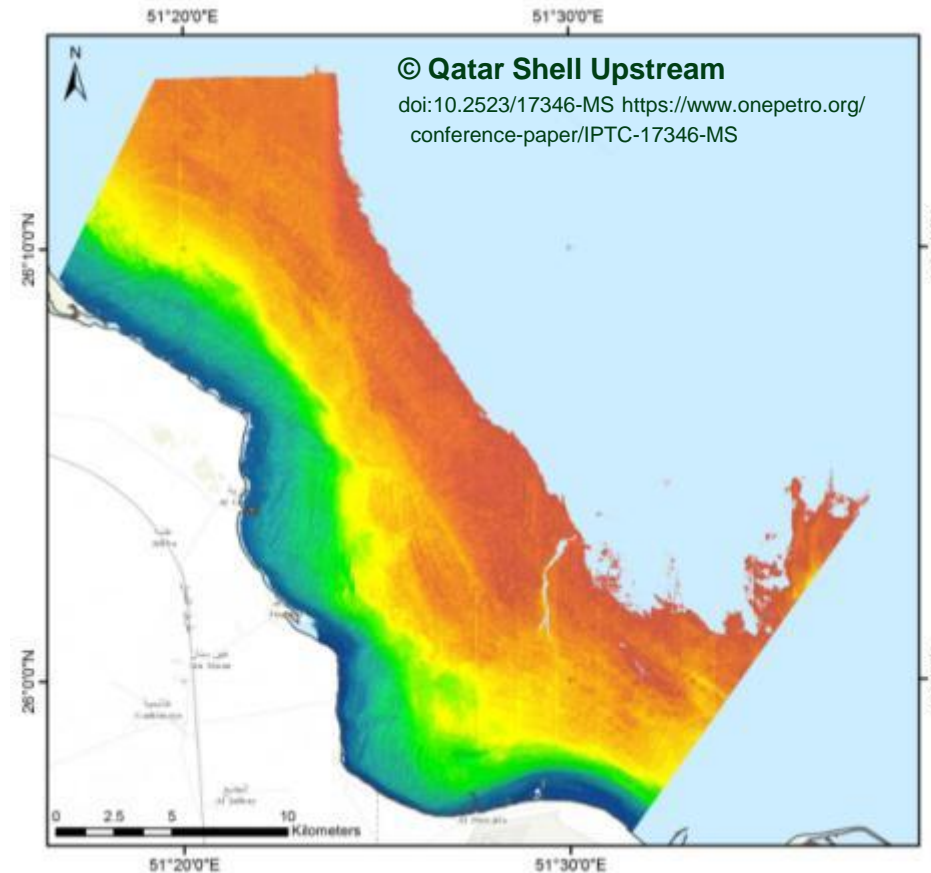


Coastal EO services: Example 1

From: IPTC conference 2014 Shell/Siermann, OGEOzine article Q1 2014:

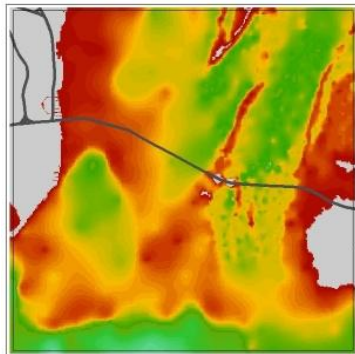
‘Supporting Qatar Shell with the execution of onshore and offshore seismic programs’

- ❖ Satellite based bathymetry survey
- ❖ eoBathy 4m res (WV-2)
- ❖ 740 sqkm delivered rapidly
- *Significant cost savings > 1Mill \$*
- *HSSE risks mitigated*
- *Project schedule efficiently supported*
- *Key technology to aid the planning and preparation of seismic surveys.*

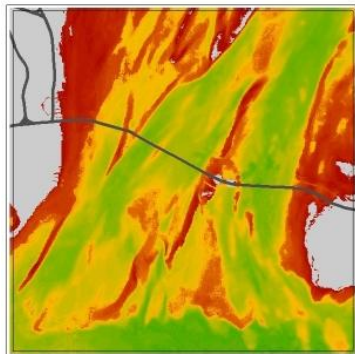


Off-The-Shelf Bathymetry

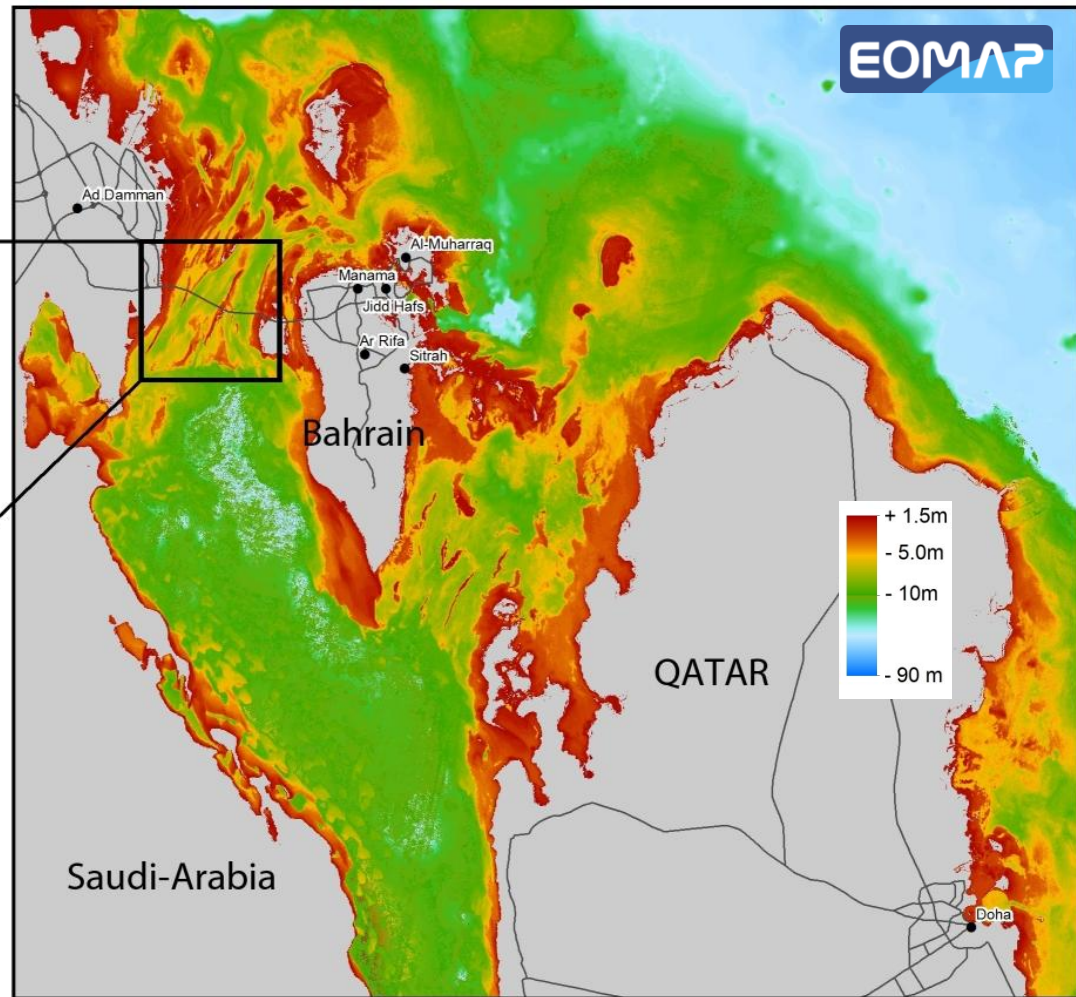
Improved transnational data sets for shallow water areas



Previous commercial Bathymetric dataset



New commercial Bathymetric dataset



Off-the shelf catalogue

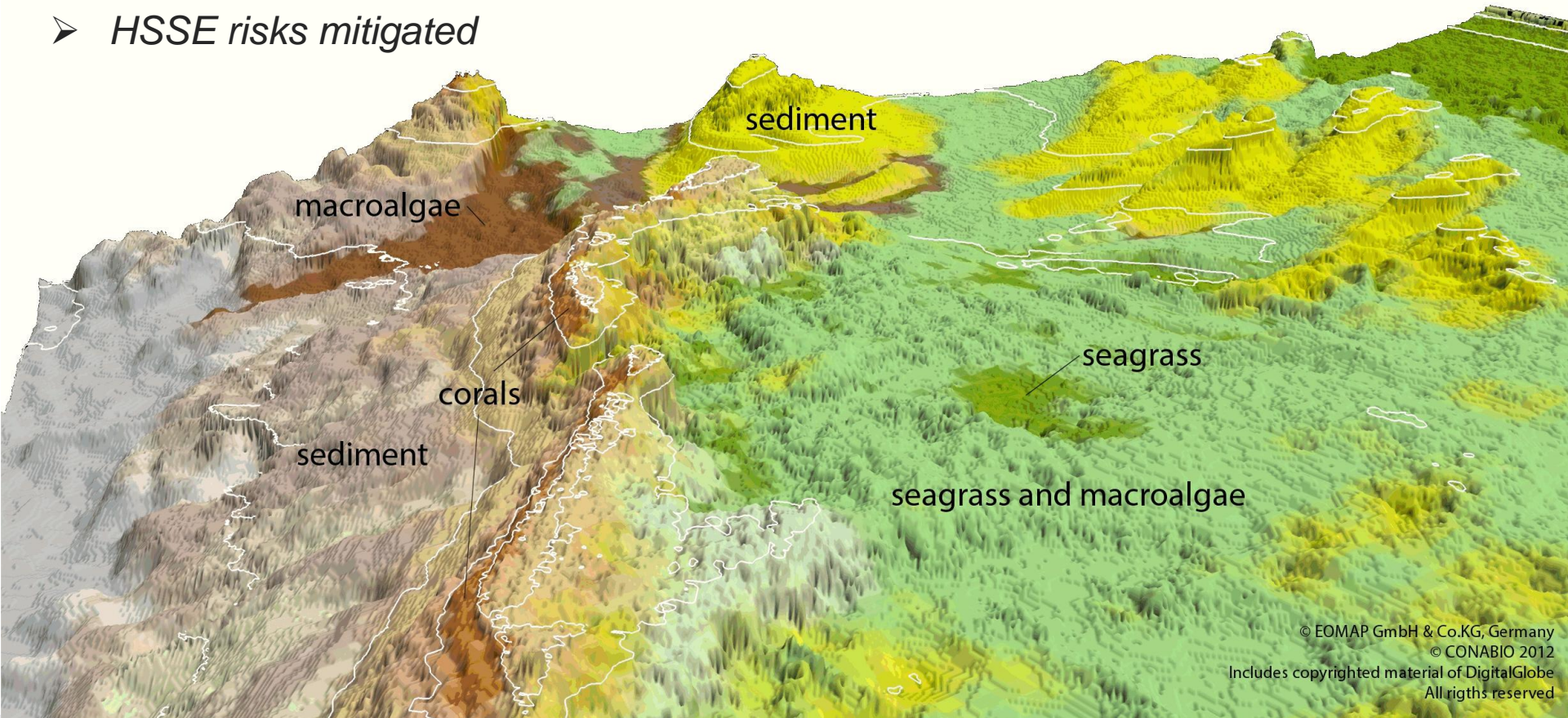
Resolutions: 30m, .. 70 cm

<http://www.eomap.com/off-the-shelf-data>

Coastal EO services: Example 2

Environmental baseline monitoring of seafloor habitats for various OG clients and governmental bodies in Italy, Australia, Mexico, Abu Dhabi, Bachrain, ...

- *Significant cost and time savings*
- *HSSE risks mitigated*



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Riviera Maya / Yucatan coast, 600 km coastline
High resolution bathymetry and seafloor survey

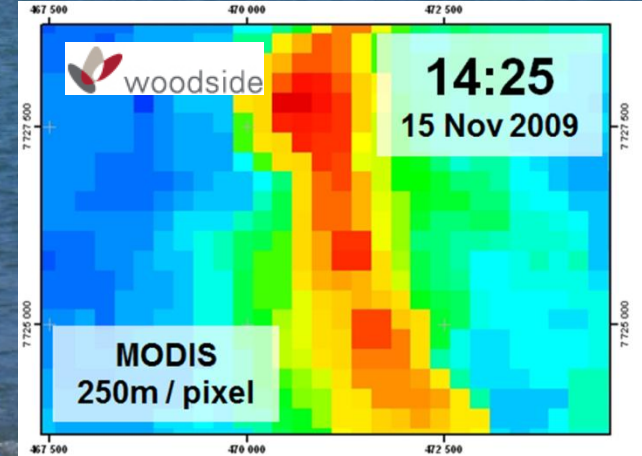
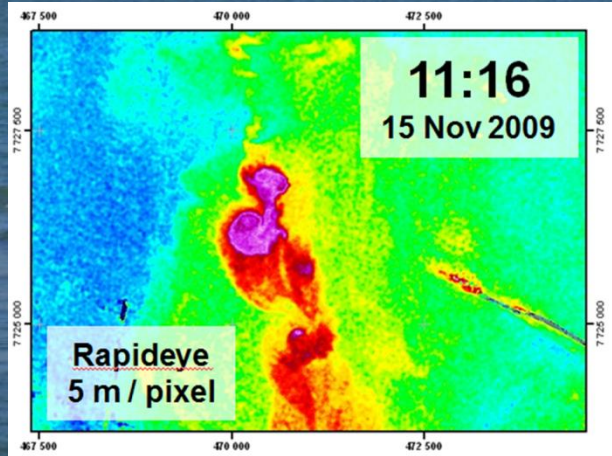
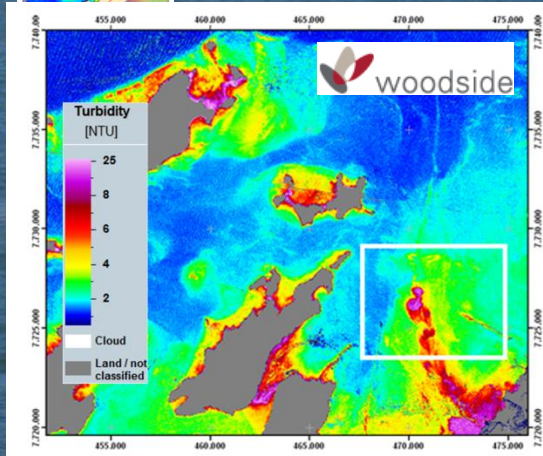
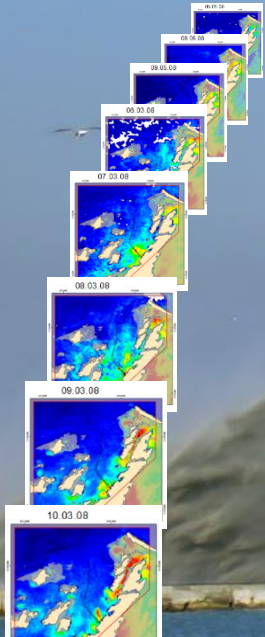
Dredge plume monitoring

e.g. for Woodside Energy, Australia:

<http://earth.eo.esa.int/workshops/gasoil2010/Hausknecht.pdf>

www.eomap.com/OWIKI-MonitoringDredgingPlumesandWaterQuality-180811-0823-14-2.pdf

Cost savings for Woodside Energy: 1 000 000 AUD



Coastal / water EO services: Example 3

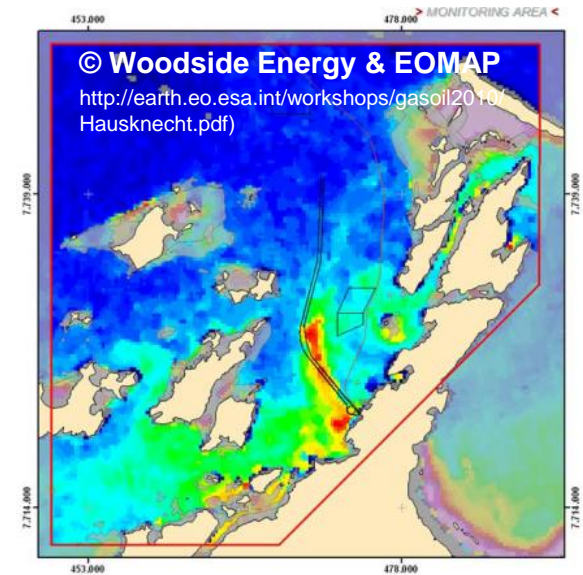
Reference: Woodside Energy, P. Hausknecht 2011, and other OG contracts 2013/2014

Environmental change monitoring for regulatory requirements

Dredging monitoring (Woodside Energy)

Dredging impact / change monitoring
on mangroves Australia

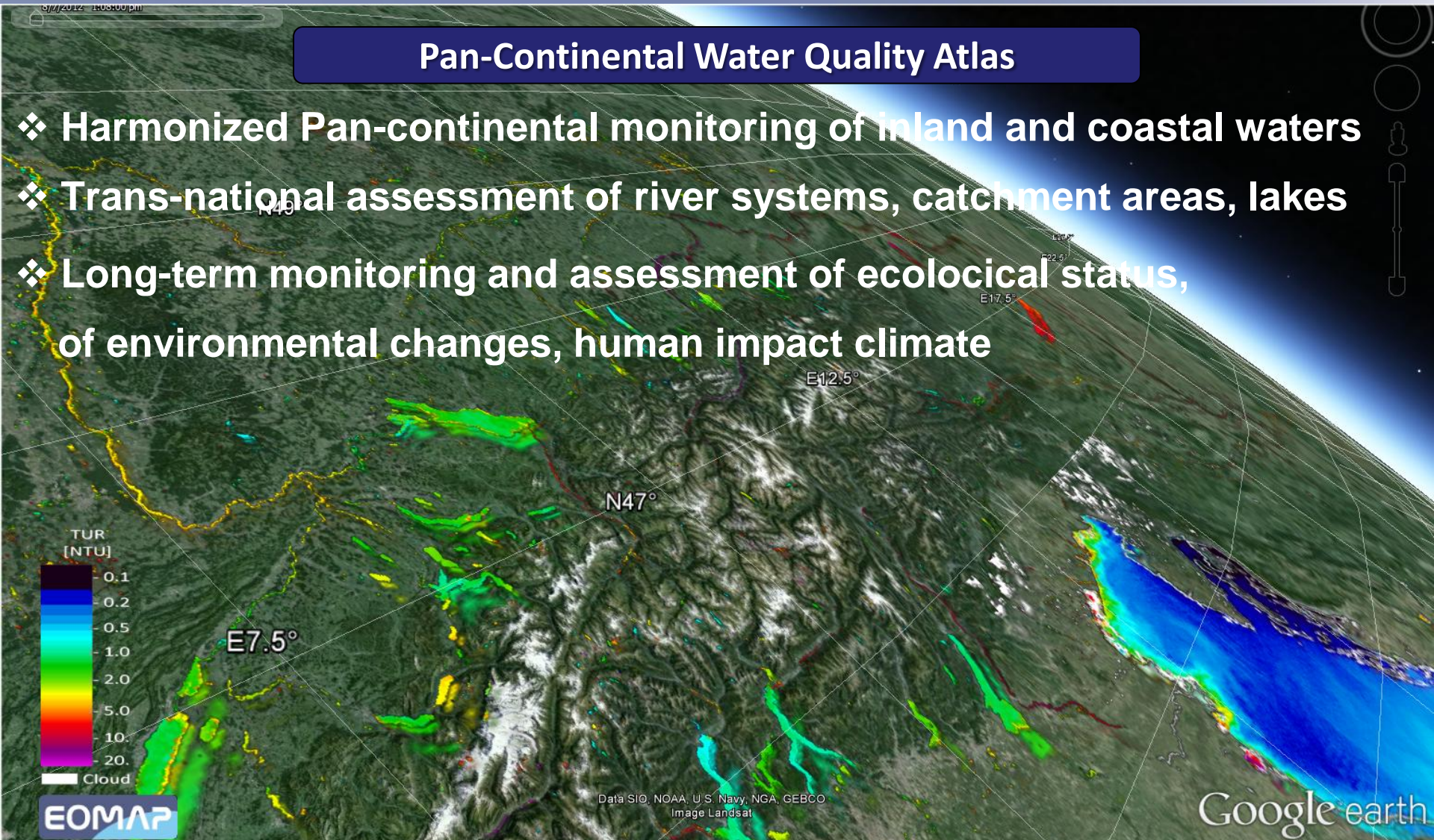
- ❖ Multi-year, regular
- ❖ Quick delivery
- *Significant cost savings > 1Mill \$*
- *HSE risks mitigated*
- *Project schedule efficiently supported*



EOMAP water quality services from 2014

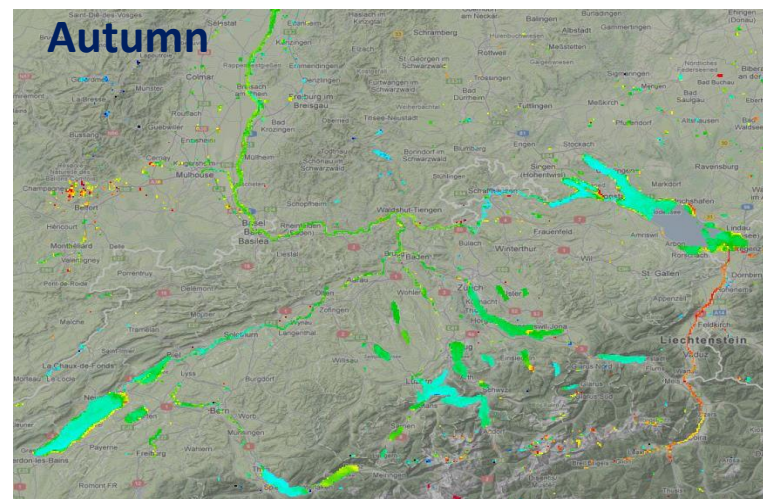
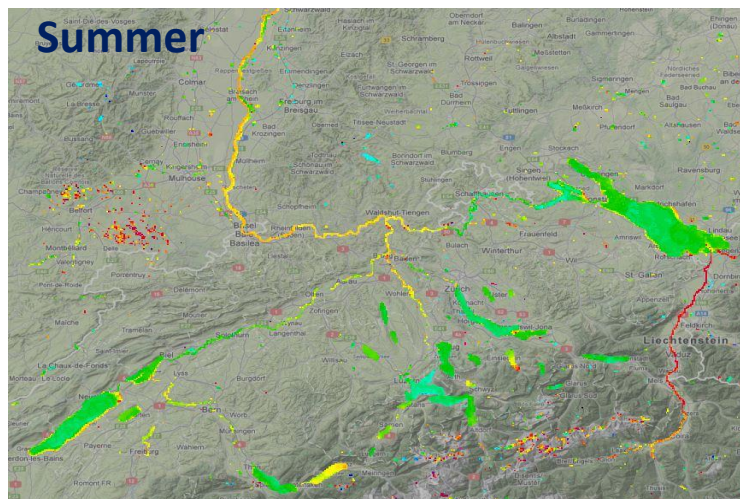
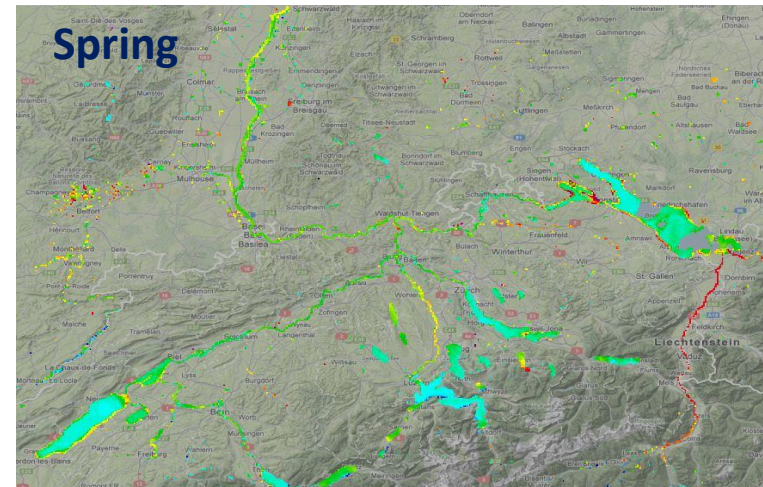
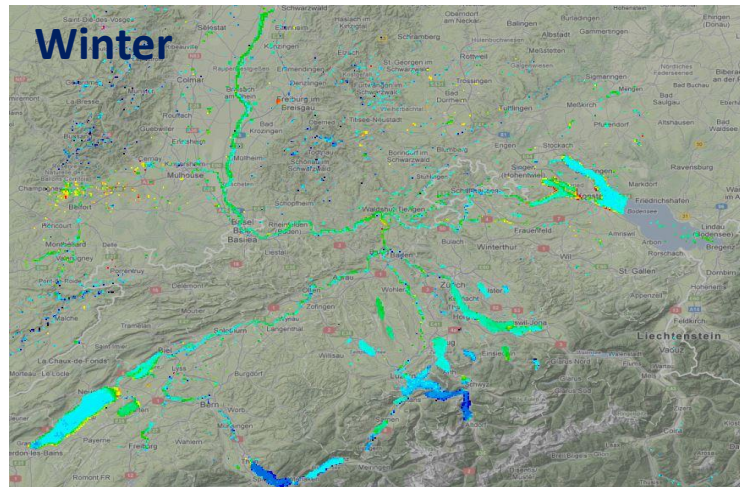
Pan-Continental Water Quality Atlas

- ❖ Harmonized Pan-continental monitoring of inland and coastal waters
- ❖ Trans-national assessment of river systems, catchment areas, lakes
- ❖ Long-term monitoring and assessment of ecological status, of environmental changes, human impact climate



Water Quality Atlas

Seasonal aggregation of products (30m)



TUR
[NTU]

0.1
0.2
0.5
1.0
2.0
5.0
10.
20.



Evolution of EO services to create economic revenues

- ❖ **On demand** created
- ❖ **Customized** definition of deliverables, metadata, service frame, ..
- ❖ **Temporary / Regular used** within project time frame



Harmonized/operational
Production | products | services

Web access platforms
and data exchange standards

Toolboxes for integration of
various aspects & services

Collaboration and
exchange platforms

- ❖ **Of-the-shelf** available
- ❖ **Standardized** deliverables, metadata, service frame, ..
- ❖ **Daily simple access, use and integration** for whole OG verticals

Role of the public funded Copernicus program

1) Serving public European bodies

with global monitoring for environment and security

2) Creating a *downstream* market

by uptake Copernicus services and innovative technologies

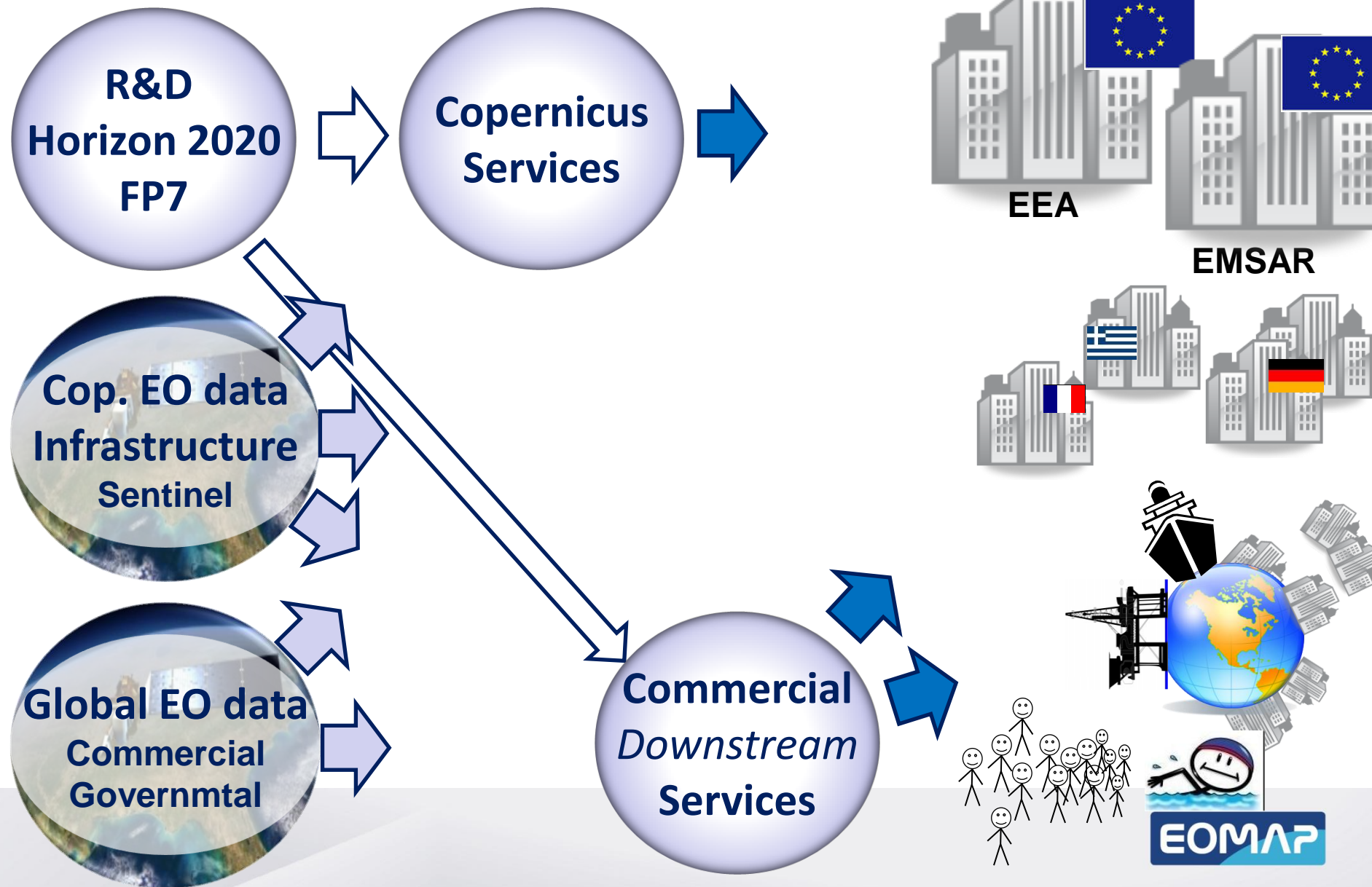
➤ EC investments into:

- ❖ Research programs (e.g. FP7, H2020) to foster 1 & 2
- ❖ Public funded Copernicus *core* services
- ❖ Data infrastructure: Sentinel satellite fleet, ...

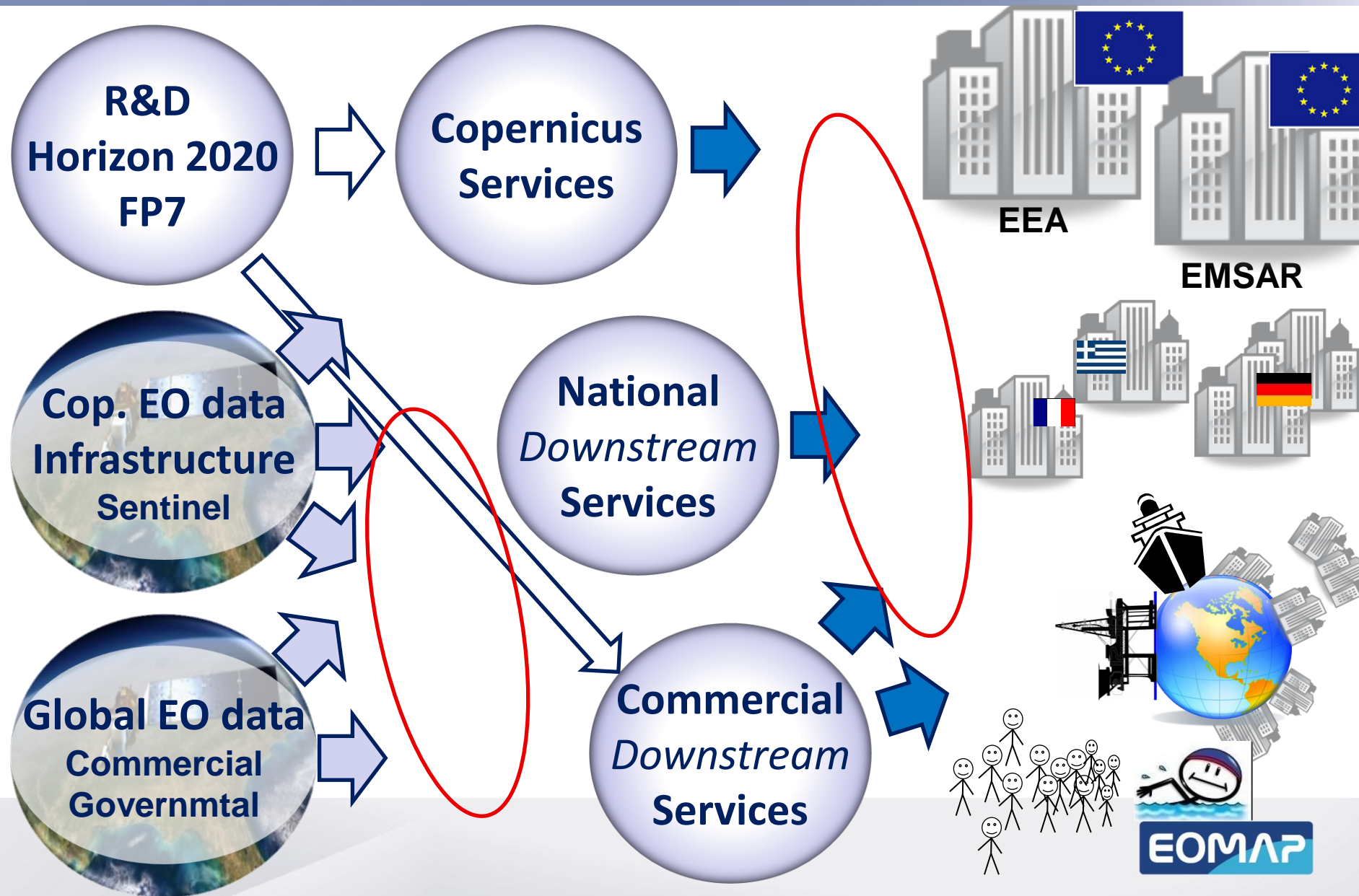
➤ ESA:

- ❖ Supporting EC in 1/2
- ❖ Supporting RND & market uptake with own programs: ESA ITT's, ...
- ❖ Data infrastructure

Creating economic values through Copernicus ...



Creating economic values through Copernicus ...



Challenges:

- How to invest most sustainable?
- How to avoid competition between public and commercial initiatives?
- Drivers of market acceptance and exploitation:
 - ❖ Value for clients
 - ❖ Cost savings, quality
 - ❖ Customizing, service level, efficiency

Efficiency, cost savings:

- Data access, data infrastructure ...
 - Examples: NASA, ESA, EC-Copernicus?

Role of the public funded Copernicus program

➤ EC investments into:

- ❖ **Research programs (e.g. FP7, H2020) to foster 1 & 2**
- ❖ **Public funded Copernicus core services**
- ❖ **Data infrastructure: Sentinel satellite fleet, ...**

➤ ESA:

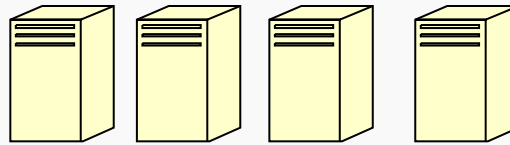
- ❖ **Supporting RND with global VA processing initiatives**
- ❖ **Supporting market uptake with own programs: ESA ITT's, ...**
- ❖ **Data infrastructure**

Production, access & data integration

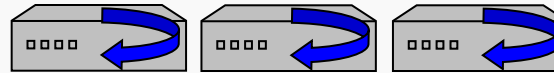
Satellite sensors



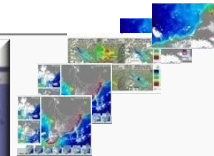
Ground stations



P & P VA processors



Hosting, Access plattf.
Customized integration, ..



complementary
services



Application, clients



Online access, intercontinental, continuous, effective: Online store for off-the-shelf products

EOMAP STORE
powered by CLOUDEO

HELP Home page

HELP DESK

SHOPPING CART
YOUR SHOPPING CART IS EMPTY.

REGISTRATION FOR THE CLOUDEO STORE
ALLOWS YOU TO
CALCULATE THE
PRODUCT PRICE AND
TO PURCHASE IT.

REGISTER NOW

USER LOGIN

USERNAME *

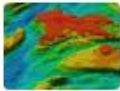
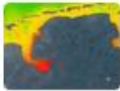
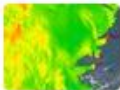
PASSWORD *

• CREATE NEW ACCOUNT
• REQUEST NEW PASSWORD

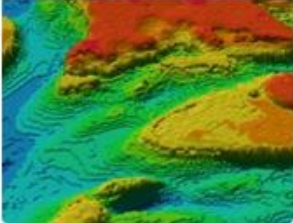
LOG IN

EOMAP

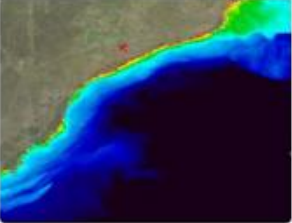
EOMAP GmbH & Co. KG is specialized in coastal and inland water monitoring services, e.g. high resolution water quality monitoring and water depth mapping. EOMAP offers customized, large-area mapping based on satellite and airborne imagery with a focus on aquatic remote sensing to international public and private customers. EOMAP's services can be applied in environmental monitoring and spatial explorations, in particular for coastal zones, inland waters, wetlands, and other areas where high-precision mapping is required.

Product Images	Title	Short Description	Rating
	Bathymetry 30	<ul style="list-style-type: none">• 30m resolution• For optical shallow water areas• Chart Datum	★★★★★ No votes yet
	Water Quality Subscription 30m	<ul style="list-style-type: none">• High resolution• Status evaluation of coastal or inland waters• Weekly provided product• Archive and subscription	★★★★★ No votes yet
	Water Quality Subscription 500m	<ul style="list-style-type: none">• Status evaluation of coastal or inland waters• Daily provided products• Archive and subscription	★★★★★ No votes yet

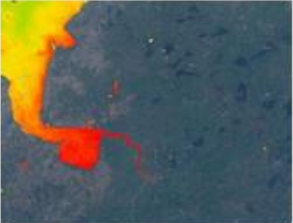
BATHYMETRY 30



WATER QUALITY SUBSCRIPTION 500M



WATER QUALITY SUBSCRIPTION 30M




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Off The Shelf Data

In the viewer below, you find areas where bathymetry (= EOBathy) or seafloor (= EOBenthic) data is already available. It is hereby distinguished between different resolutions of the products (e.g. EOBathy2: information in 2m resolution). The following products and resolutions are available:
EOBathy2 - EOBathy5 - EOBathy30 - EOBenthic

Click on the desired areas to receive additional information!



Best Layer

☐ Google Maps Hybrid

☐ Google Maps Satellite

Overlays

☒ EOBathy2

☒ EOBathy5

☒ EOBathy30

☒ EOBenthic

Google

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Conclusion

➤ Trust into

- the future revenues created by commercial services
- free and open market mechanisms to foster services

Conclusion

➤ Trust into

- the future revenues created by commercial services
- free and open market mechanisms to foster services

➤ Create space for commercial services:

- space for market driven innovation
- define borders between public funded initiatives:
 - ✓ .. *Resolution spatial/temporal, products, services*
- space data infrastructure:
 - Investing into access and data exchange mechanisms ... > GEOSS

Thank you for your attention



Satellite derived bathymetry, Abu Dhabi
Includes copyrighted materials of Digital Globe

Efficiency



HELP

HELP DESK

SHOPPING CART

YOUR SHOPPING CART IS EMPTY.

USER LOGIN

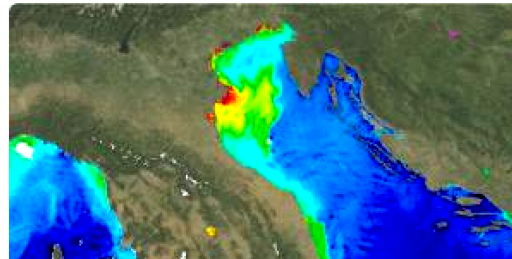
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PASSWORD *

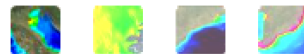
[CREATE NEW ACCOUNT](#)

[REQUEST NEW PASSWORD](#)

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WATER QUALITY 500 TURBIDITY, ADRIA



[Order Options](#)

[Description](#)

[Details](#)

[Licensing & Pricing](#)

[Downloads](#)

WATER QUALITY SUBSCRIPTION 500M

- Daily measures at medium resolution
- Coastal and inland water evaluation
- Archive and Subscription availability

Rating:

No votes yet

Water Quality Type *

- ☐ Organic Absorption
- ☐ Turbidity
- ☐ Chlorophyll a

Subscription Type *

- ☐ 3 month
- ☐ 6 month
- ☐ 12 month

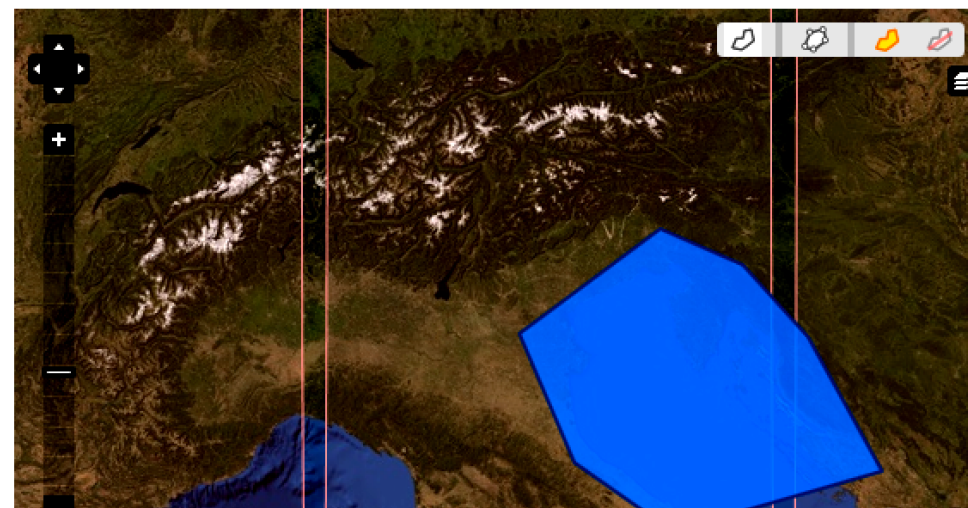
Subscription Starting Date

Date

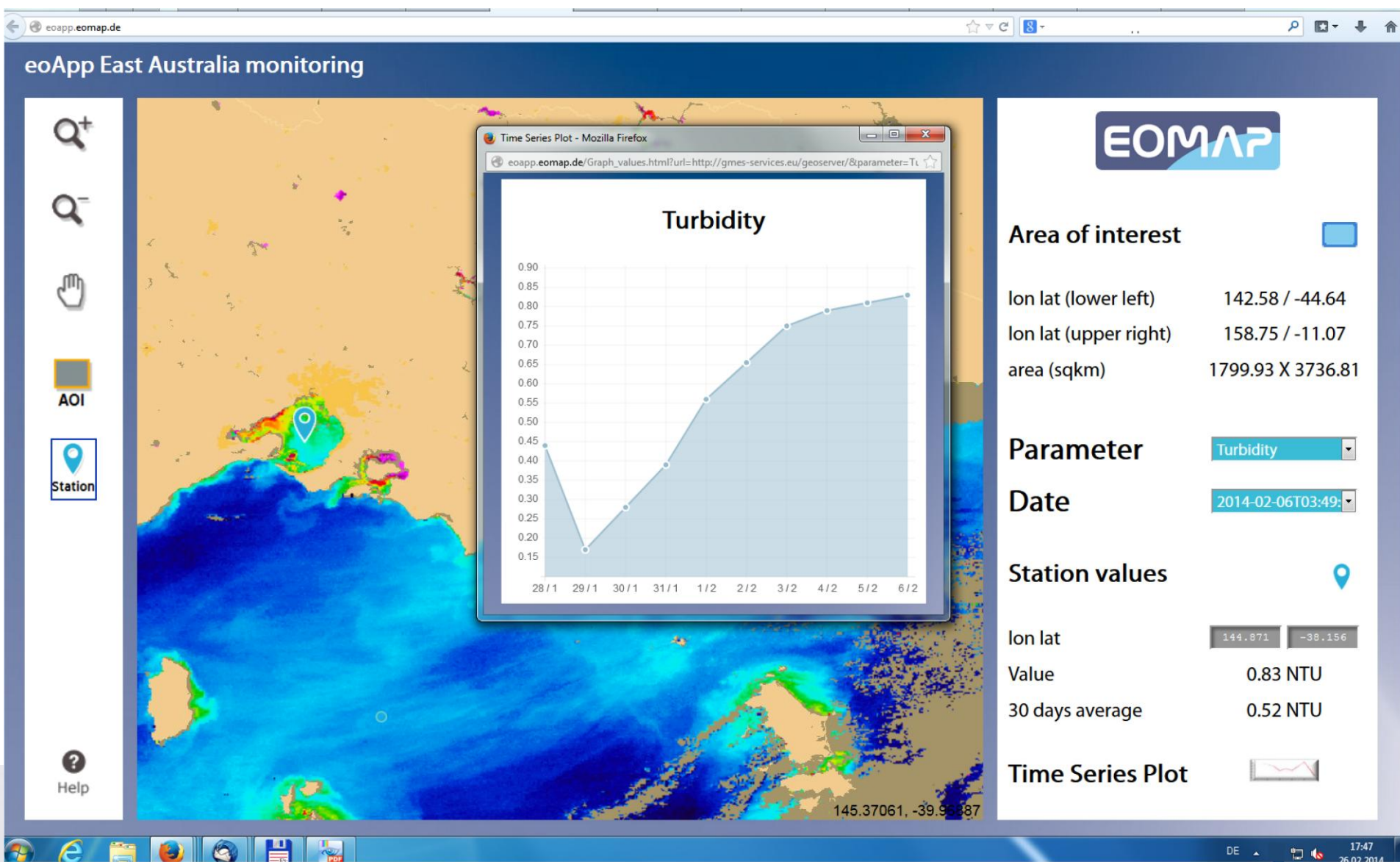
11.05.2014

E.g., 04.06.2014

[How to define an AOI?](#)



Mobile access tools: EOMAP Dredging App



Commercial companies in the aquatic sector, using EO data

Variety of companies using EO, specialized into

- Image providers
- Consultants
- Value-adding service providers:
 - Environmental monitoring and mapping
 - Bio-geochemical & hydrodynamic modelling
 - Integrated solution providers