ESA Earth Observation activities and potential Maltese interests

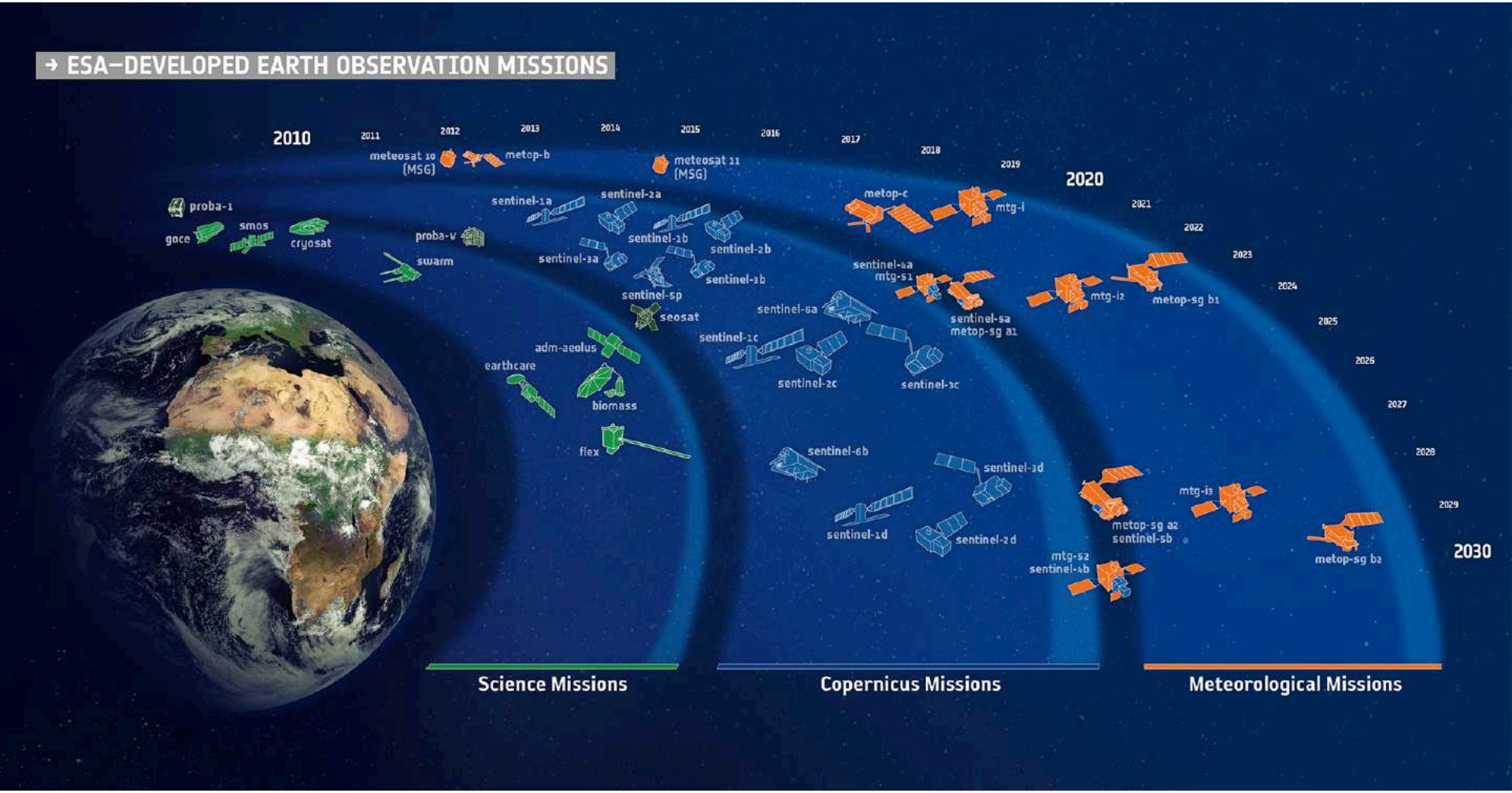
Gordon Campbell
EO Science, Applications and Climate Department
Directorate of EO Programmes
ESA

Introduction

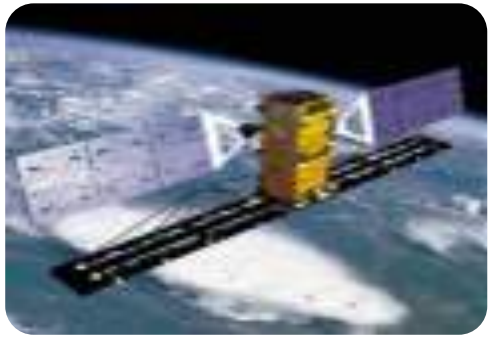
- Context for EO
- Overview of developments and capabilities you can exploit
- Overview of selected EO applications and Earth science
- Selected on-going ESA initiatives to connect to (possibly)
- Way forward....

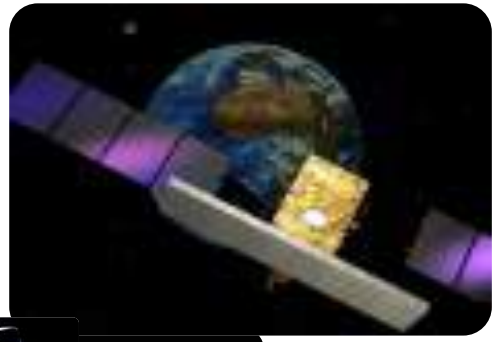
New Societal Boundary Conditions

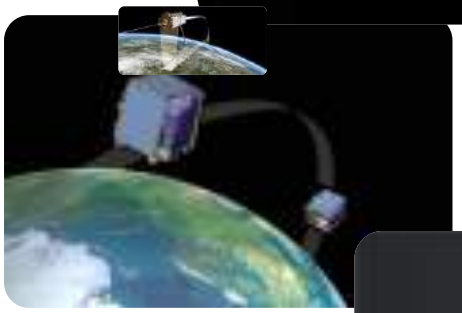
Europe is the global leader in EO

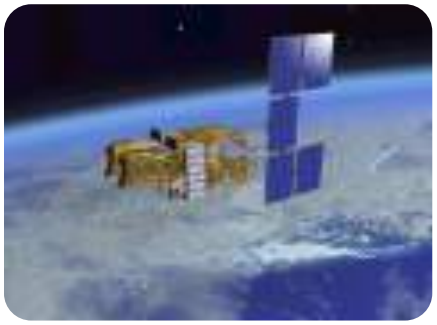


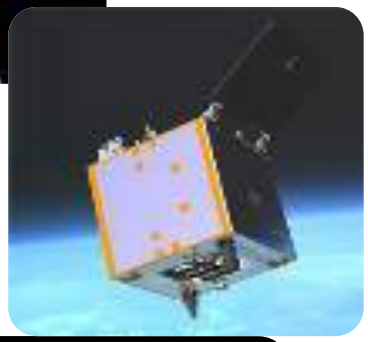
National missions

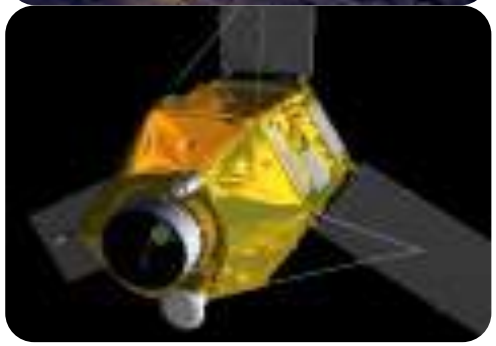










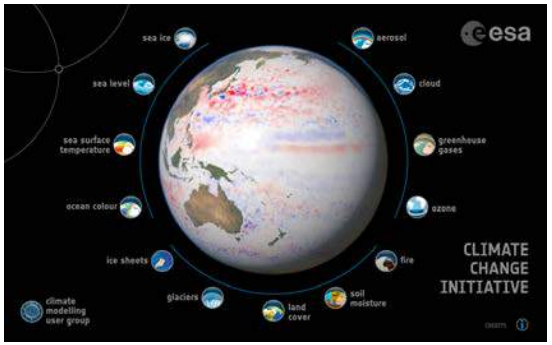


EO Envelope Programme – the EO development engine

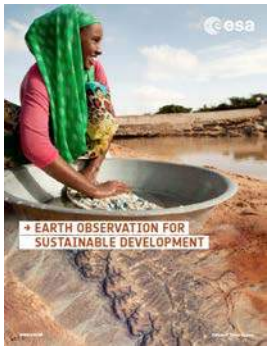
EO ENVELOPE PROGRAMME

Innovative
Earth Science missions

Copernicus

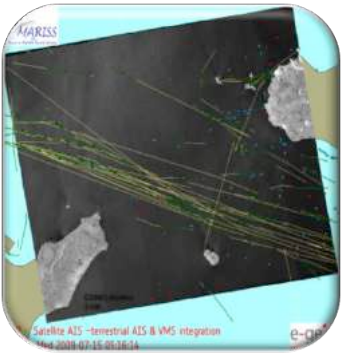


Climate Change
Initiative

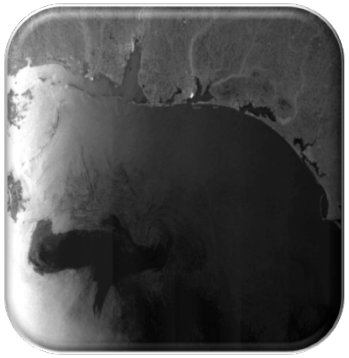


EO for
Sustainable
Development

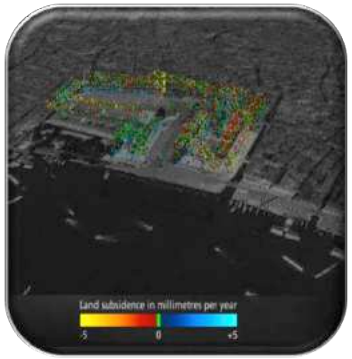
Wide range of applications already developed



Maritime surveillance



Oil spills

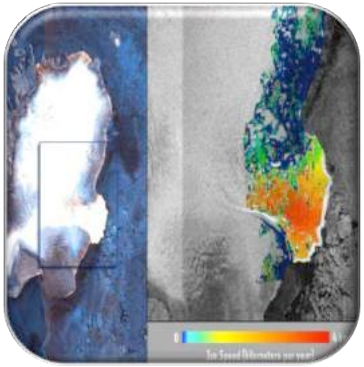


Land subsidence

Tectonics

Volcanoes

Sea ice extent



Ice speed

Floods

Deforestation

Vegetation

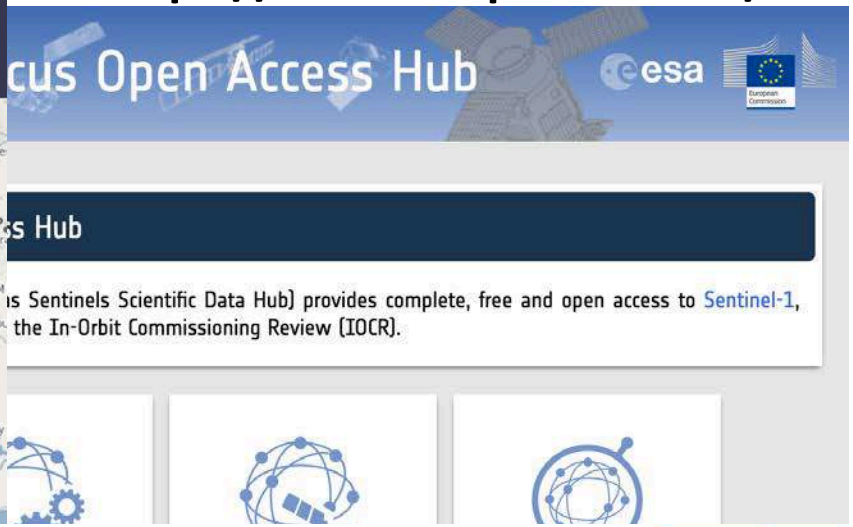
Atmosphere

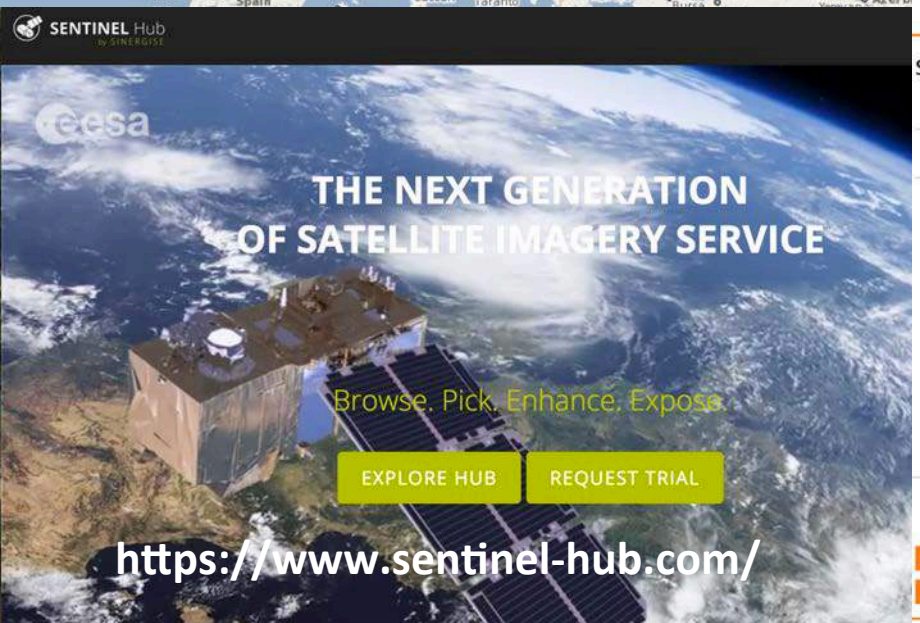
Ocean colour

What is already available for you

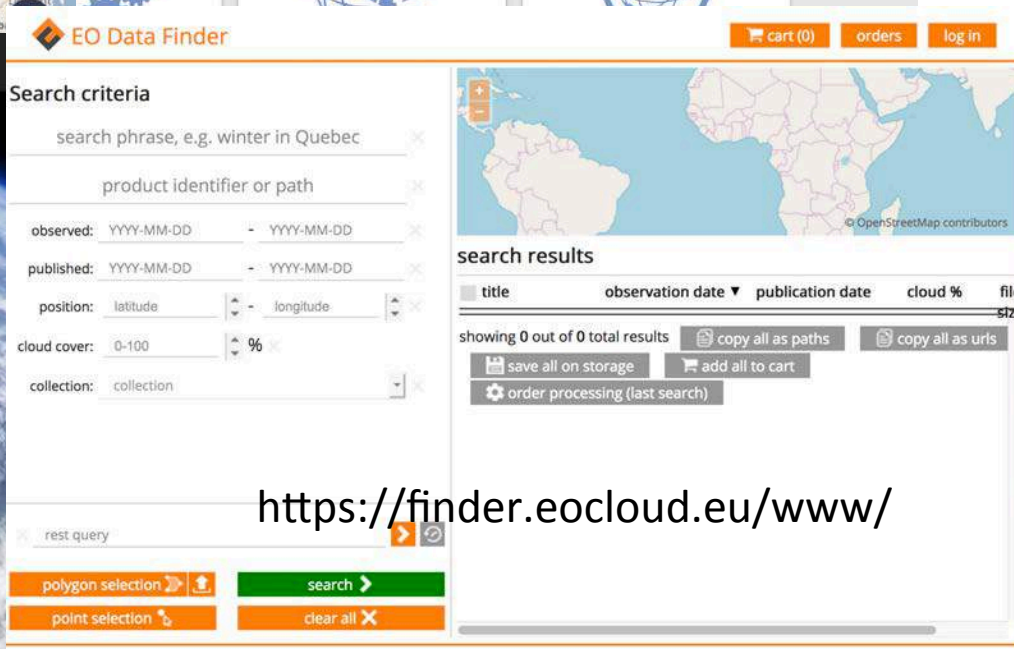
Access to EO data

https://scihub.copernicus.eu/



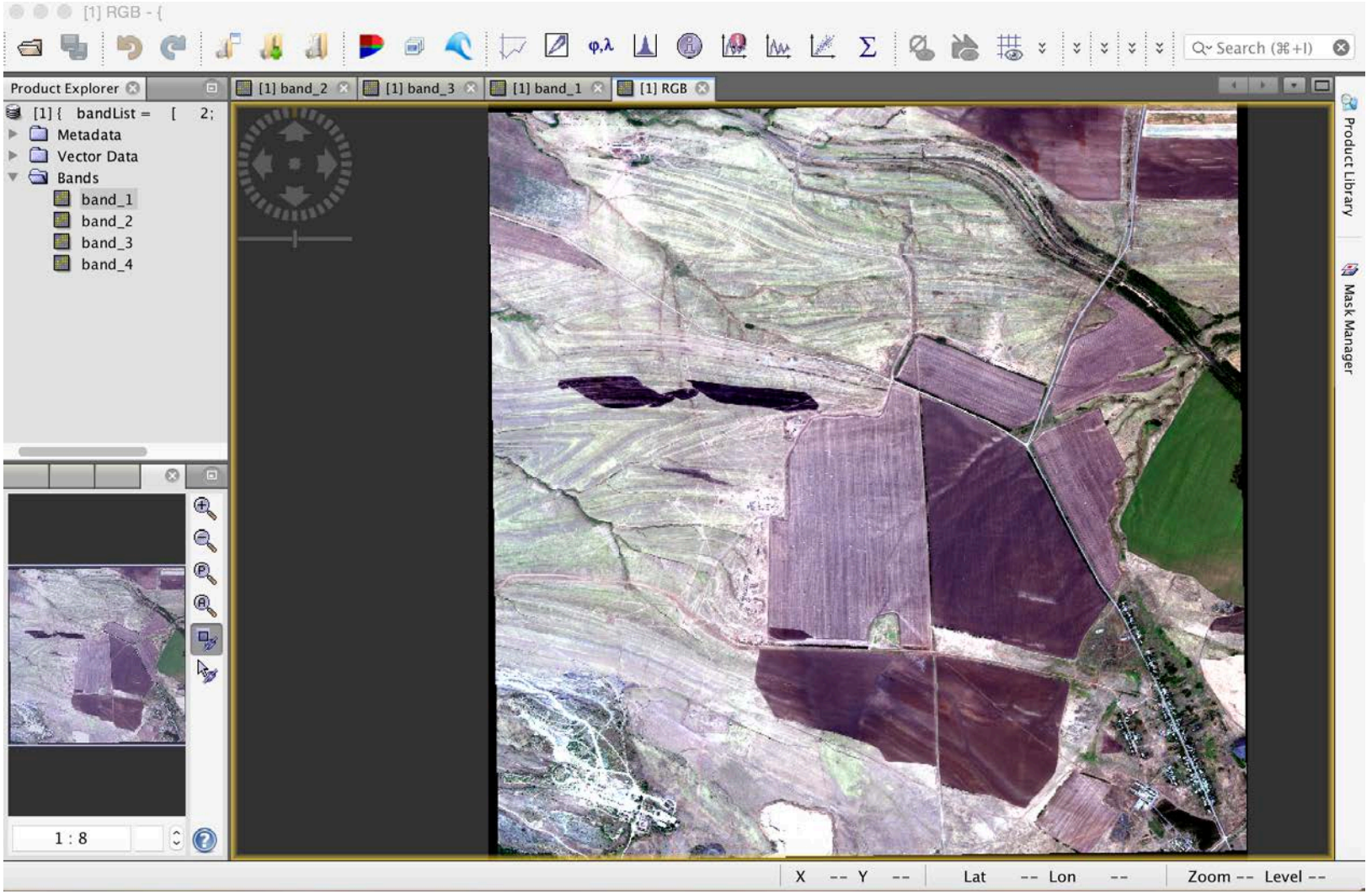


https://www.sentinel-hub.com/



https://finder.eocloud.eu/www/

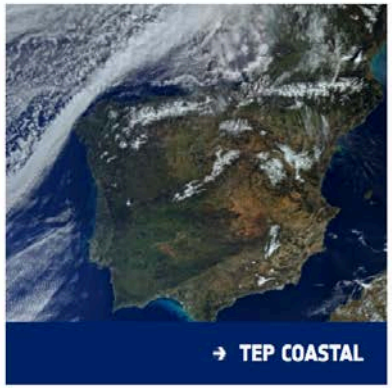
Access to EO processing software

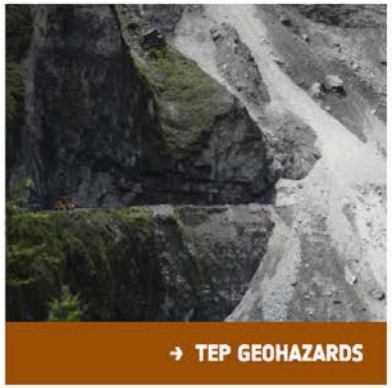


http://step.esa.int/main/toolboxes/snap/

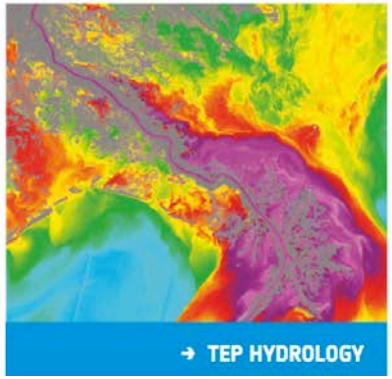
Access to customized technical capabilities

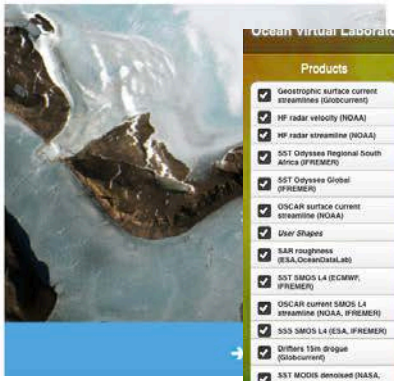
Thematic Exploitation Platform



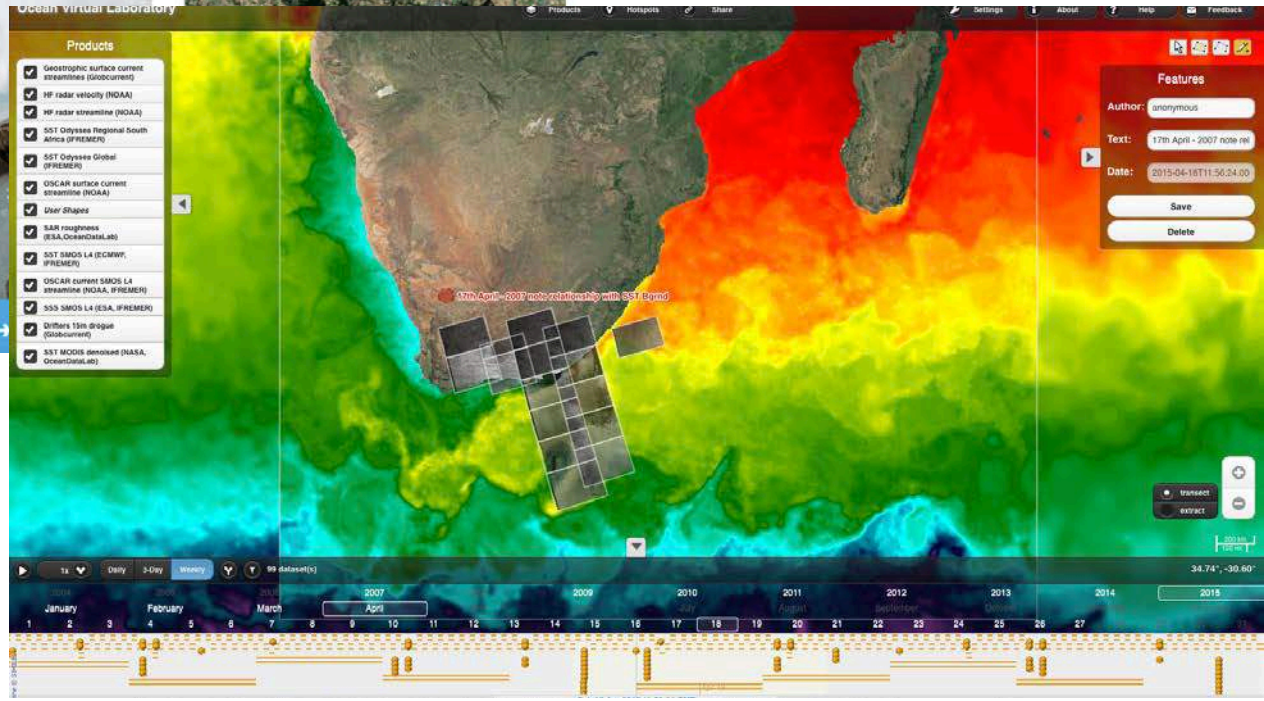


https://tep.eo.esa.int/



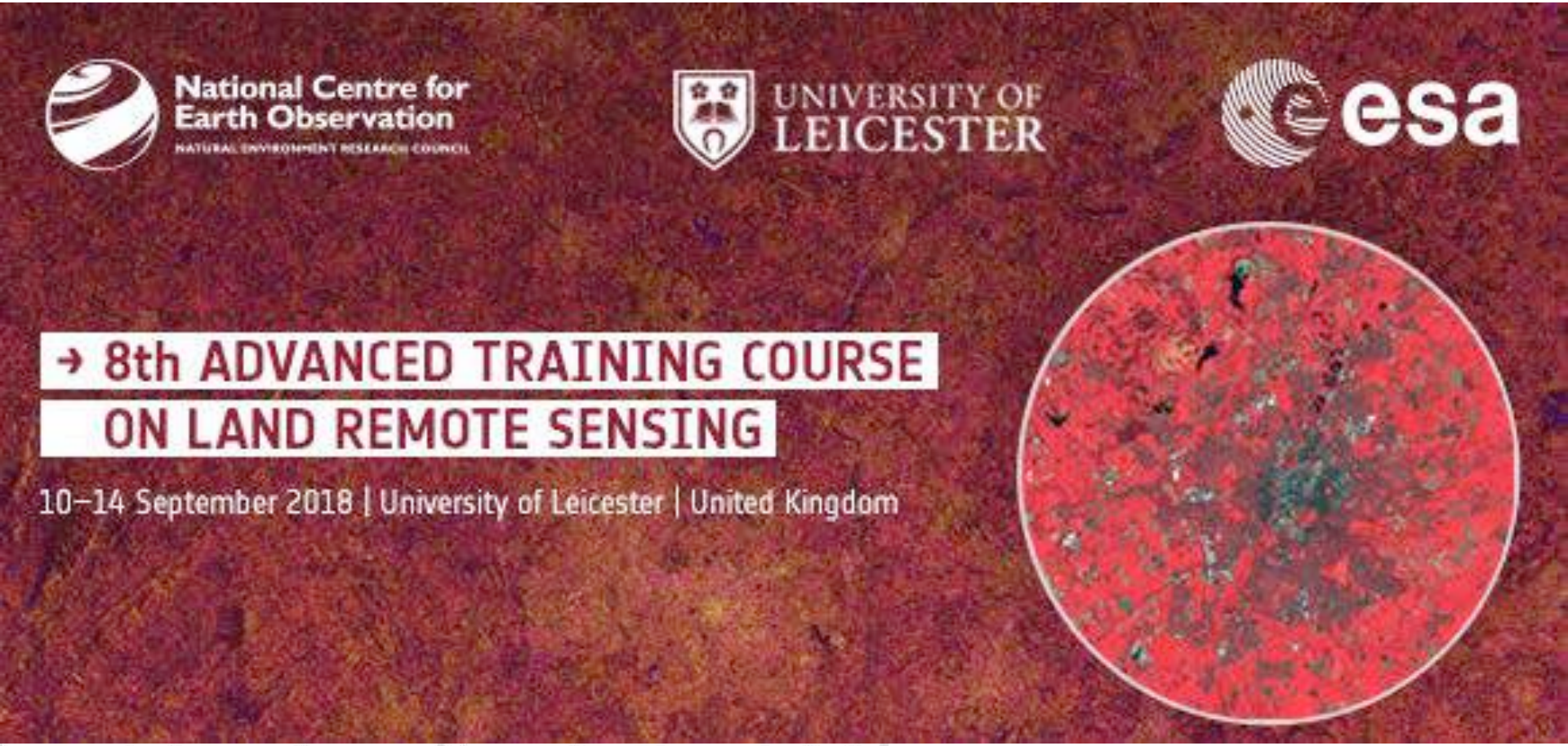


https://ovl.oceandatalab.com



Training support

https://earth.esa.int/web/guest/eo-education-and-training



and has funded the development of many tools for EO education.

Read more

with a specific focus on their assimilation into Earth System models.

https://rus-copernicus.eu/portal/

Workshops

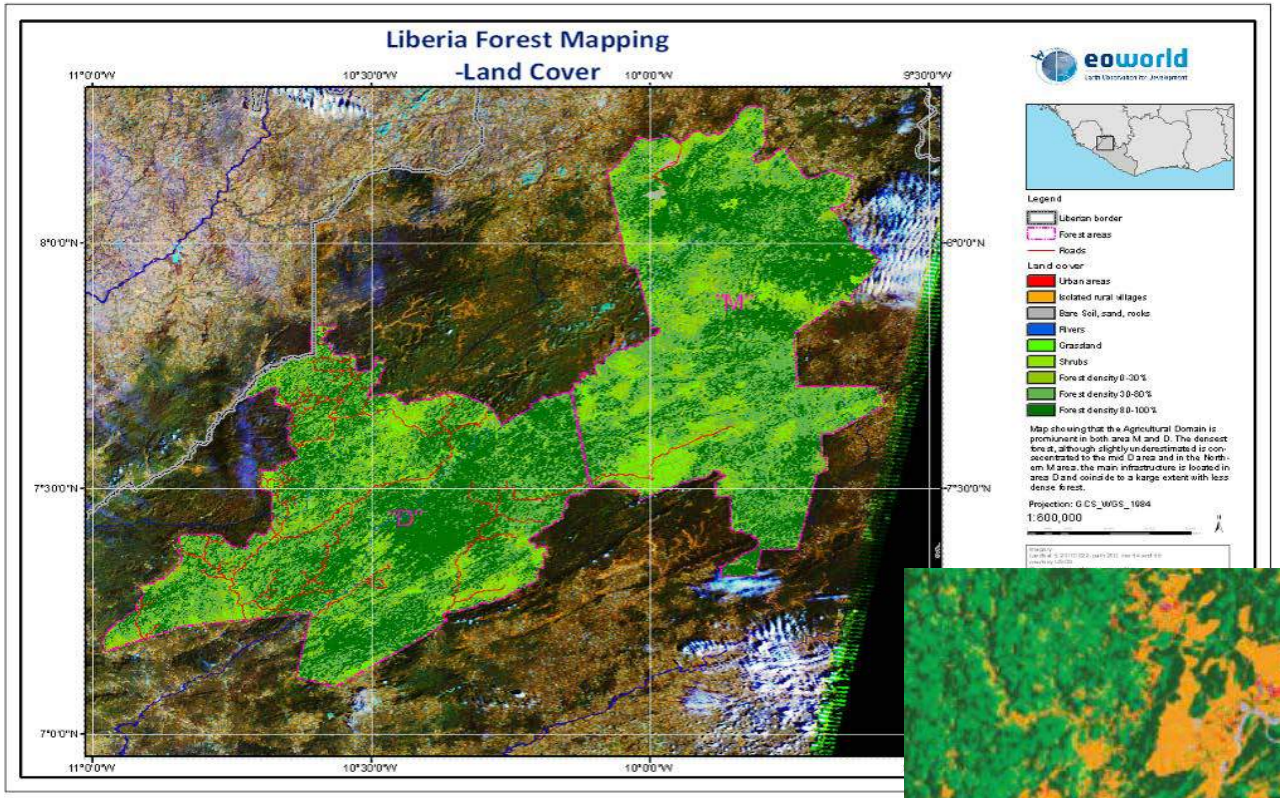

esa
SEASAR 2018
Advances in SAR Oceanography
7–10 May 2018
ESA–ESRIN | Frascati (Rome), Italy

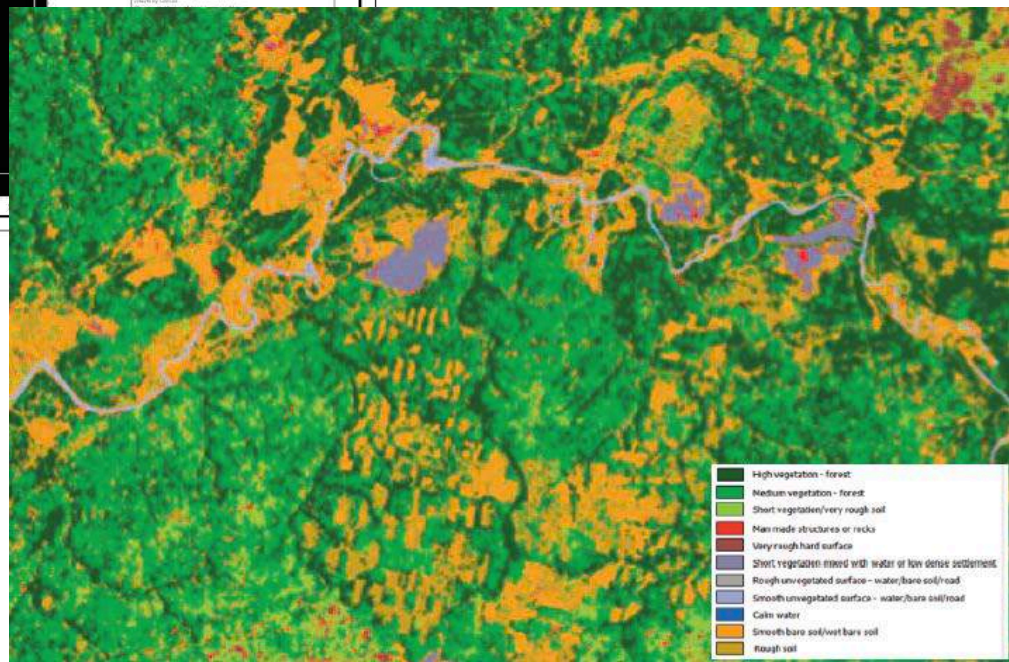

THE ESA EARTH OBSERVATION Φ-WEEK
EO Open Science and FutureEO
12–16 November 2018 | ESA–ESRIN | Frascati (Rome), Italy


living planet symposium
MILAN
13–17 May
2019

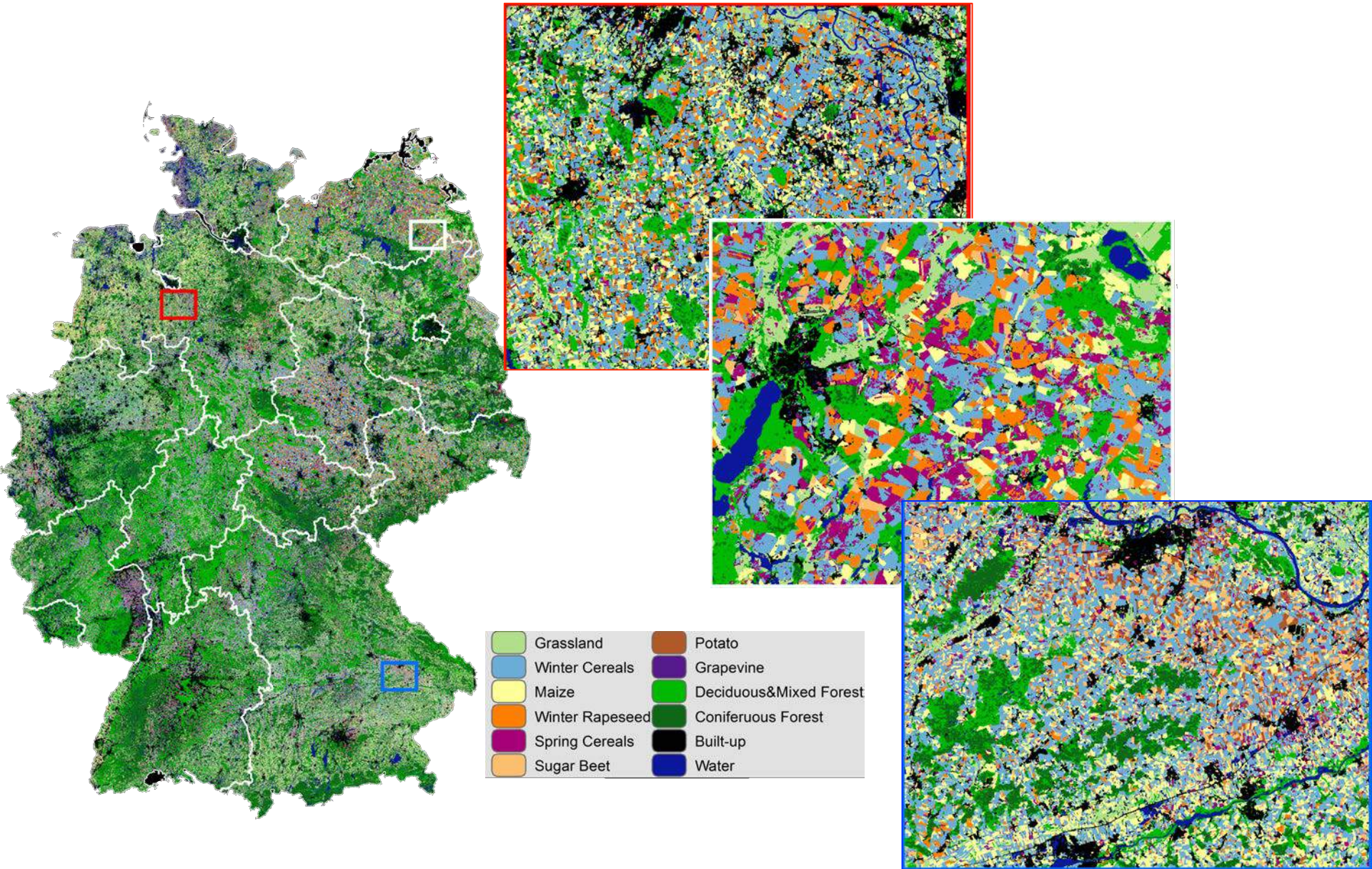
Example capabilities already developed

Forest status mapping

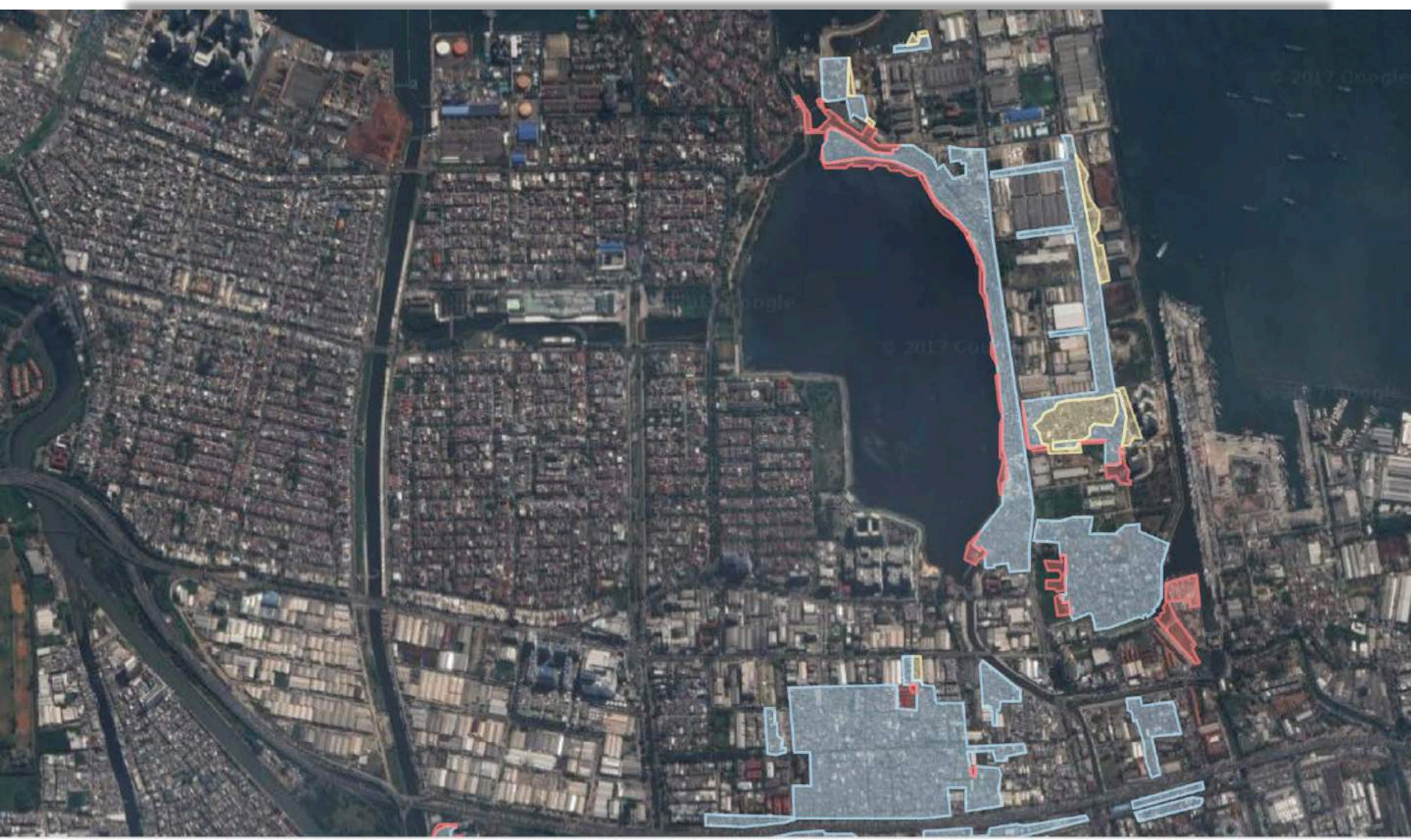




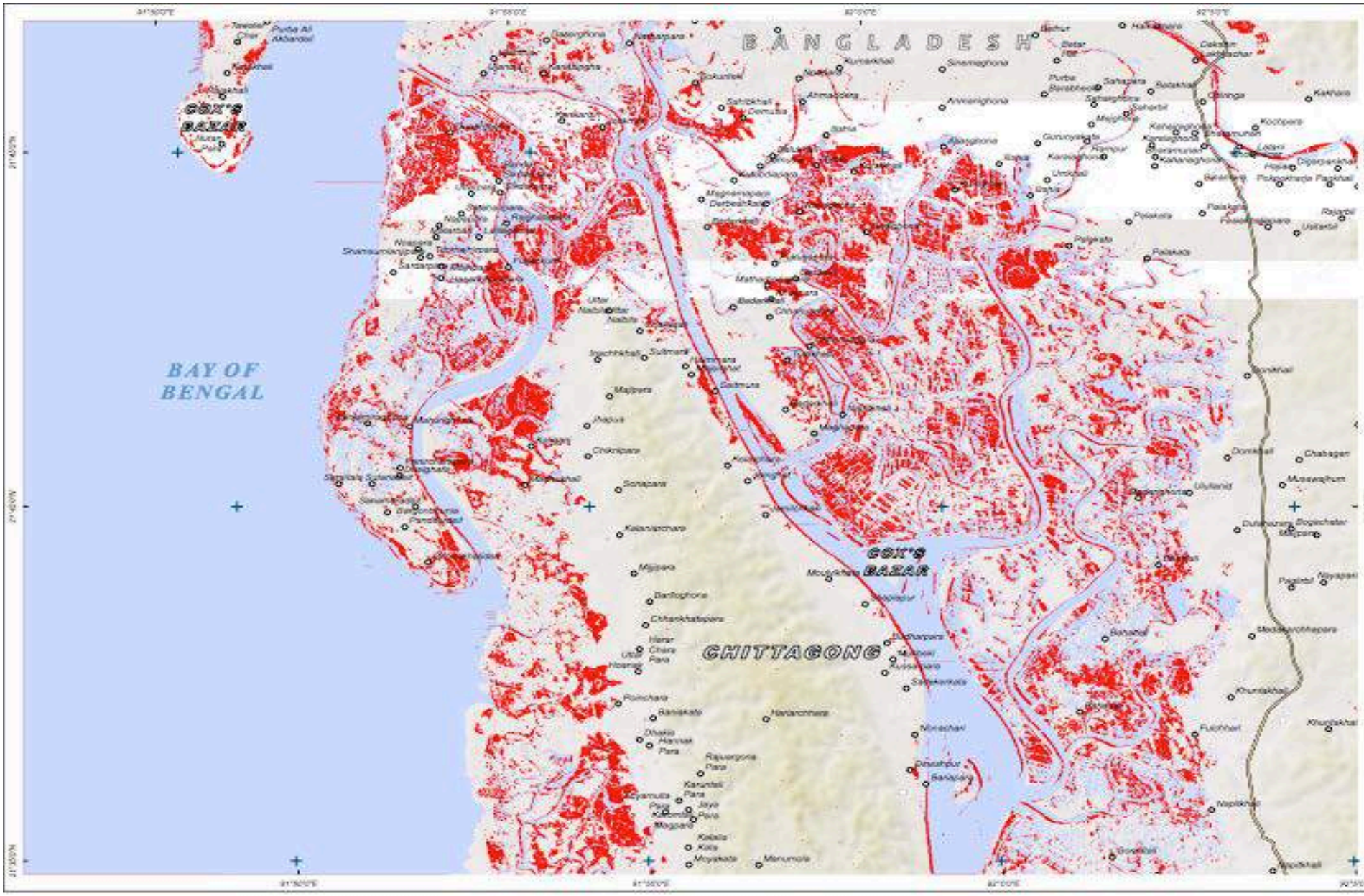
Agriculture



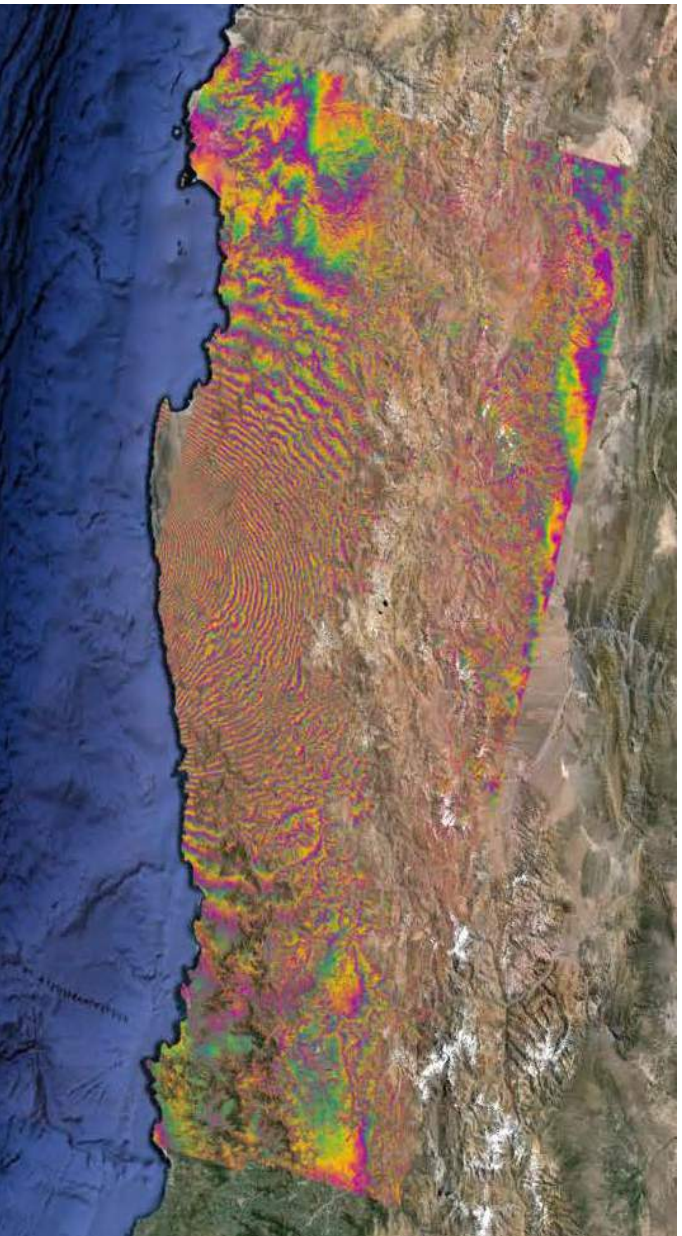
Urban Development monitoring

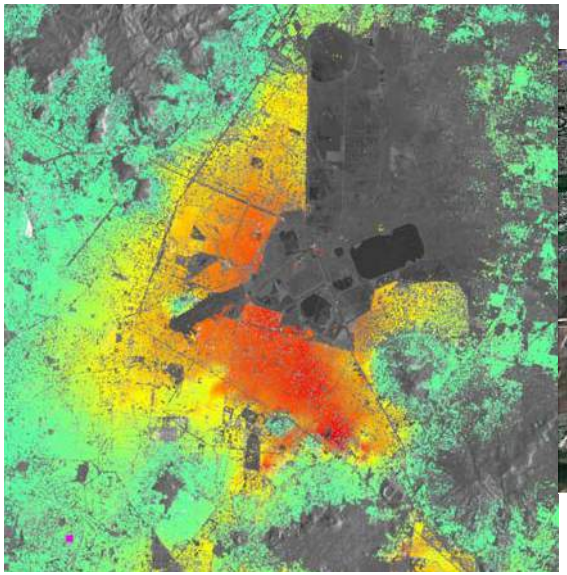


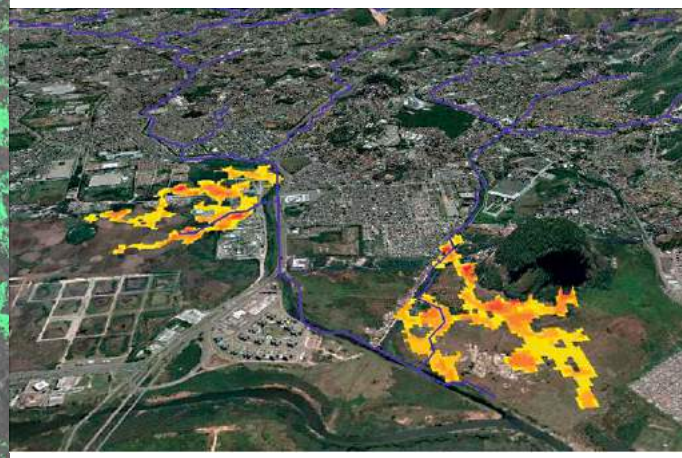
Hydrology and flooding

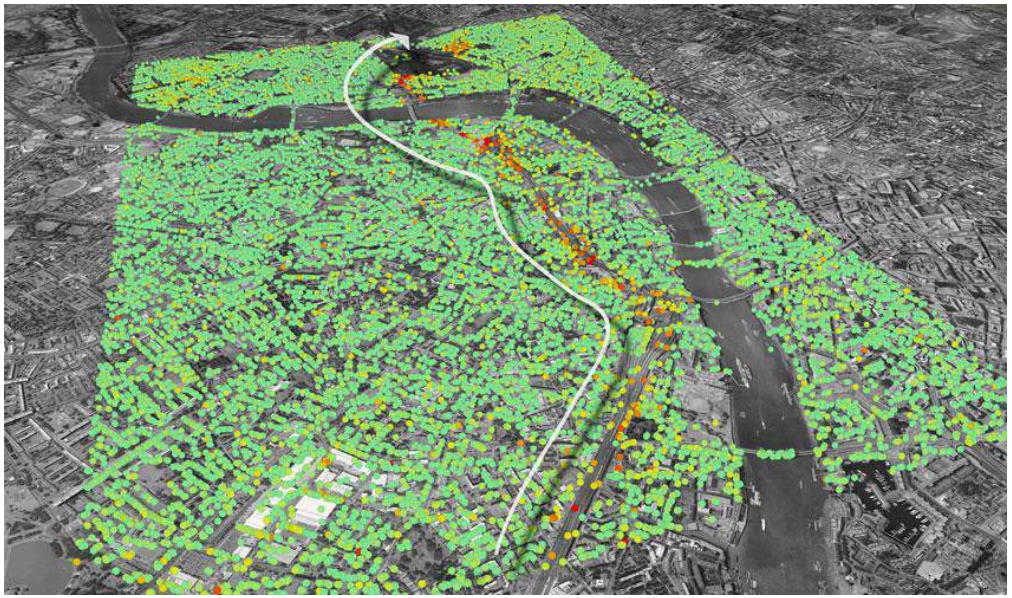


Land surface motion

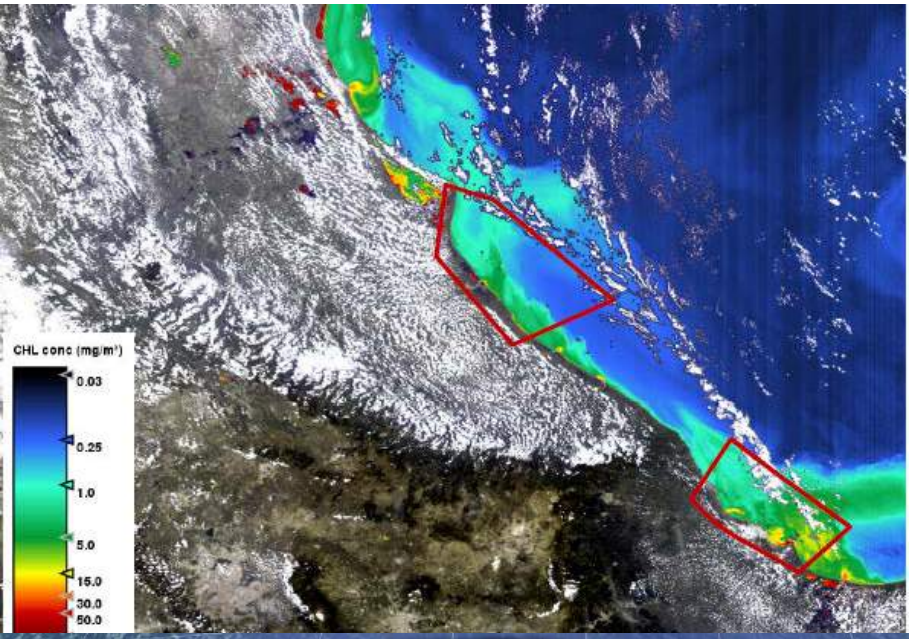


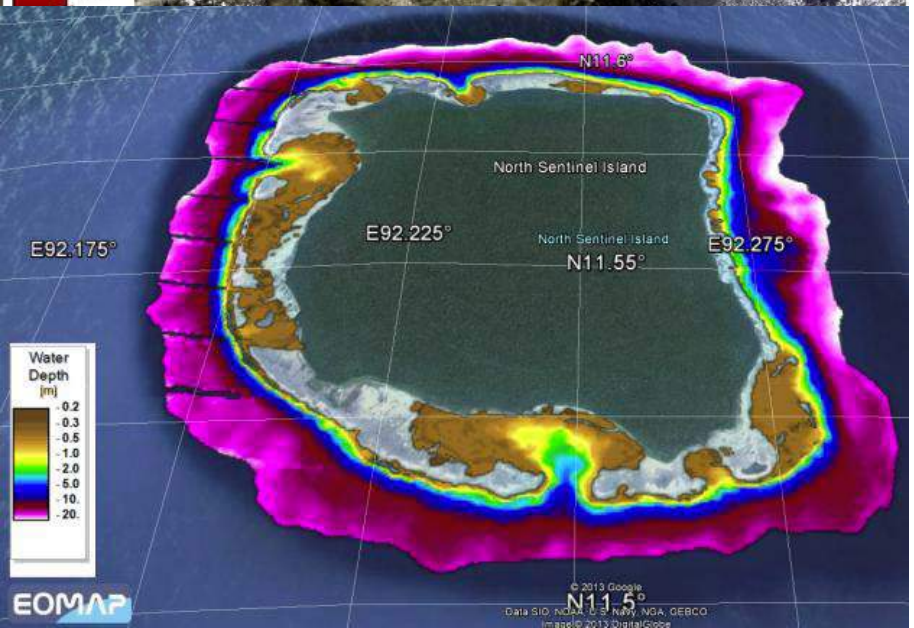


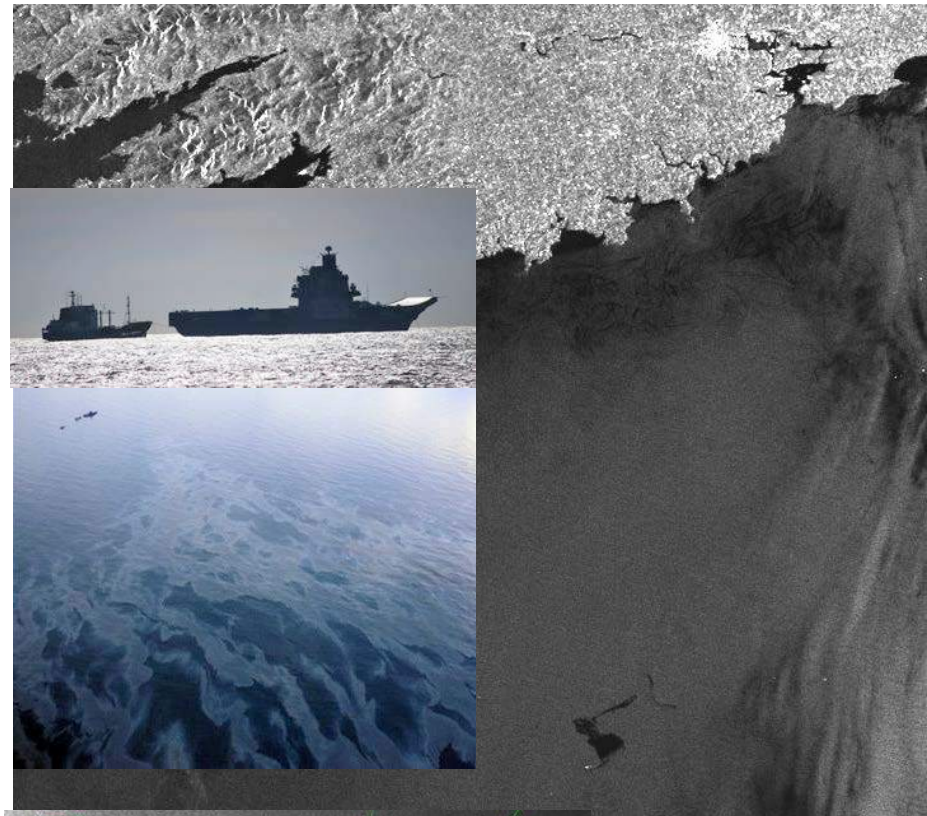


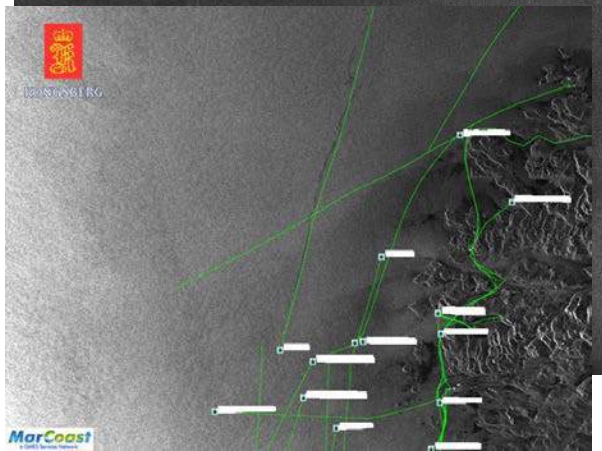


Marine and coastal environmental protection

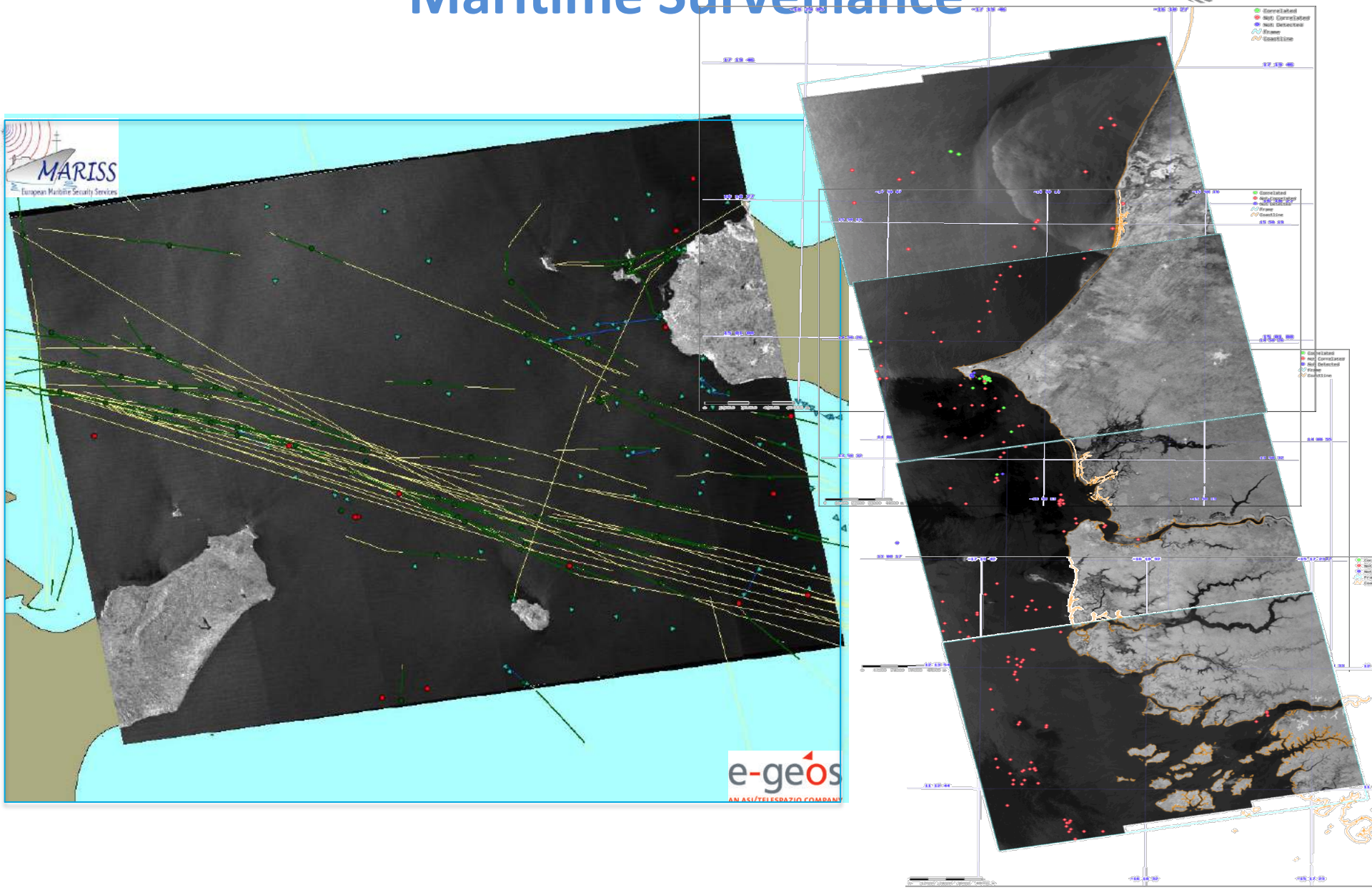




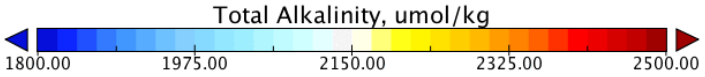


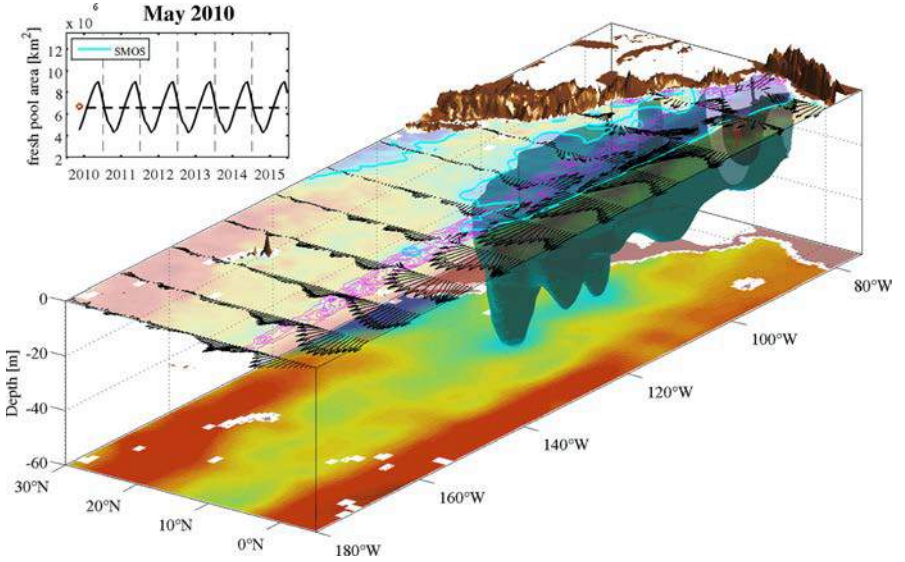


Maritime Surveillance

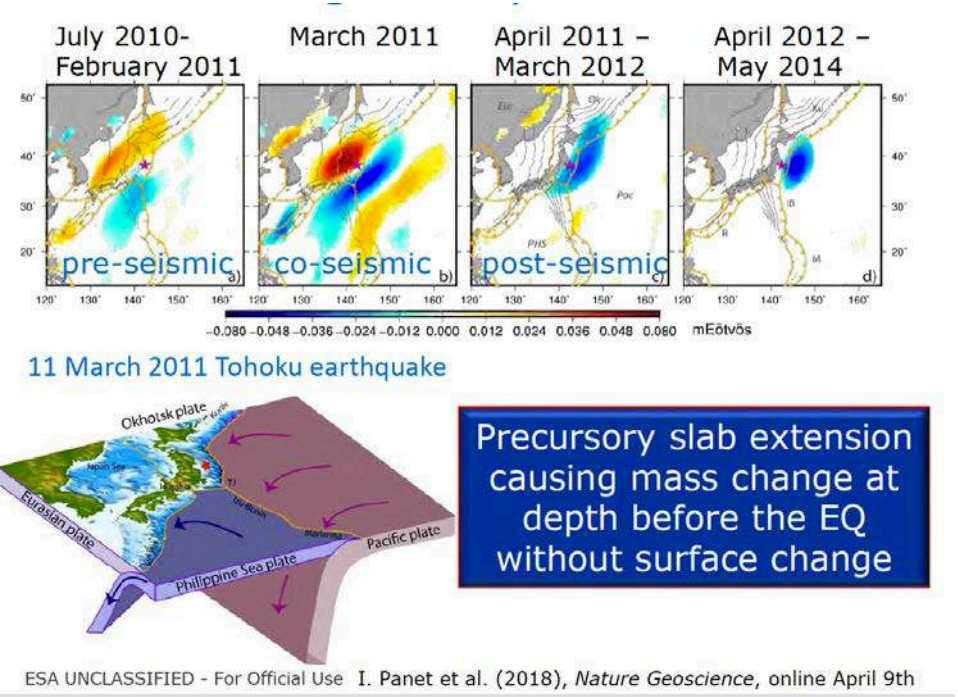


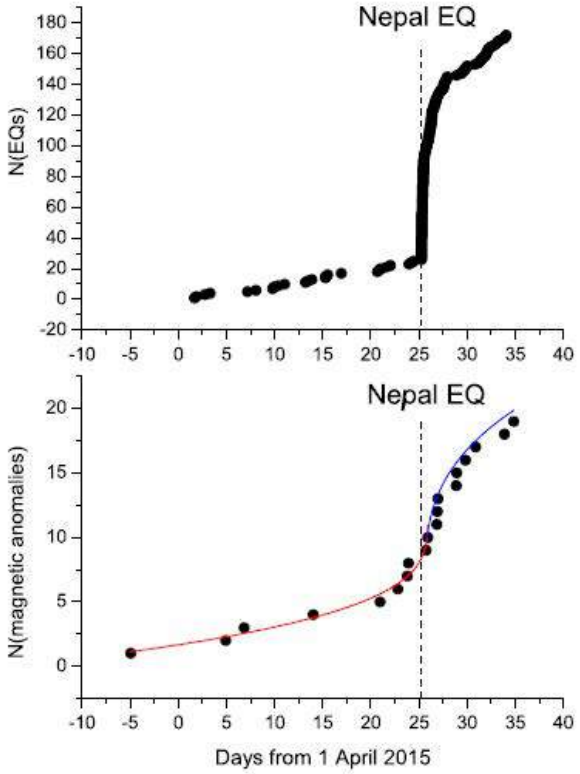
Ocean processes





Solid Earth Research





Top: Cumulative number of M4+ earthquakes occurred within Dobrovolsky area versus time

Bottom: Cumulative number of magnetic anomalies detected by Swarm satellite A versus time.

ESA and other initiatives to connect to (if you want)

EO for Sustainable Development

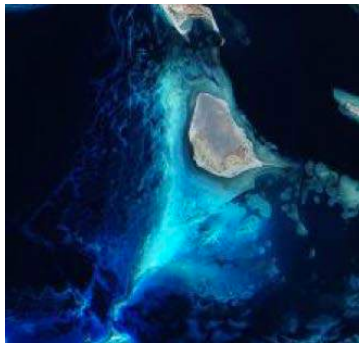
EO4SD – cooperation with IFIs

agriculture and rural development
eo4sd

urban development
eo4sd

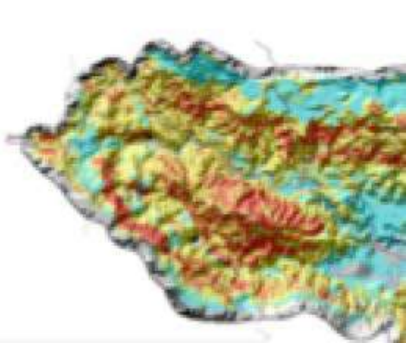
water resources management
eo4sd

ITT 2016
KO 2017

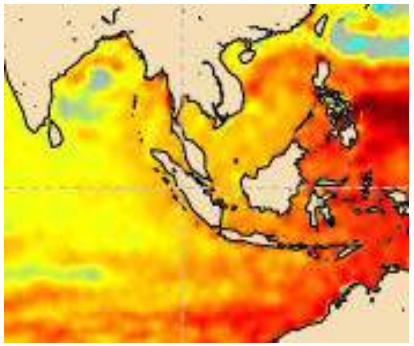


Marine & Coastal resources

Fragile States

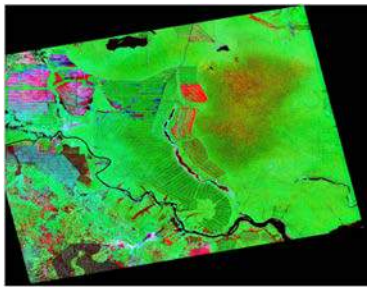


Disaster Risk Reduction

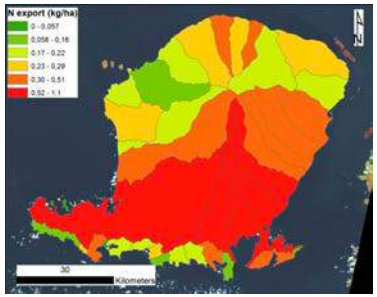


Climate Resilience

ITT 2017
KO 2018



Forest management

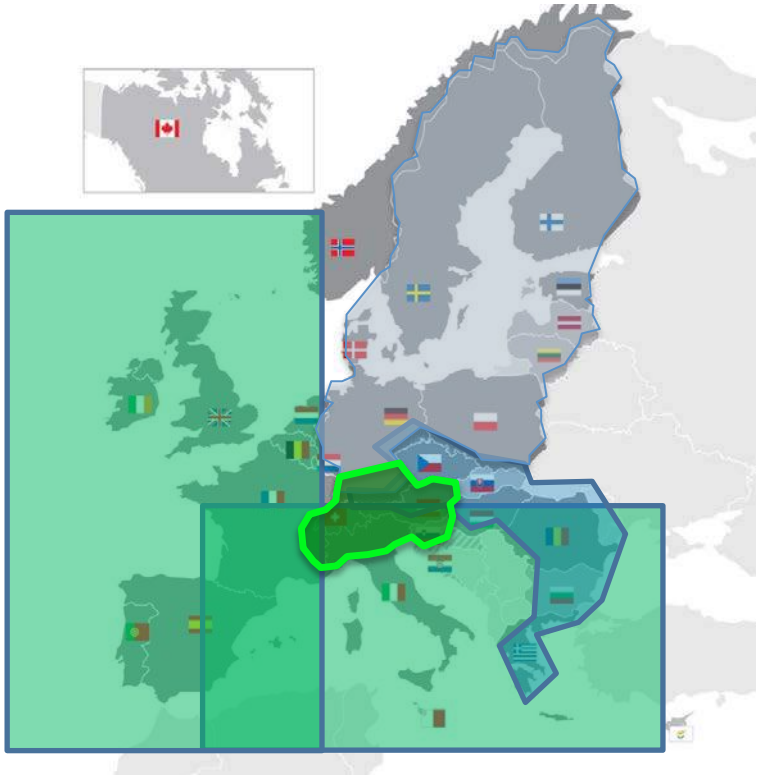


Ecosystem Assessment

ITT 2018
KO 2019

Regional Initiatives

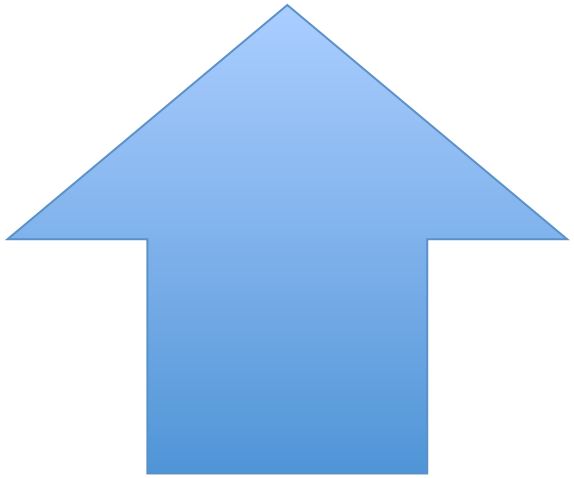
- Set of coordinated activities: **science, public sector, industry growth and infrastructure components;**
- **Focus on regional priorities** with high interest for Member States;
- Initial regions: **Baltic, Black-sea/Danube**, Atlantic, Arctic, Mediterranean, Mainly driven by interest of Member States;
- **Link with existing regional institutions, H2020 activities and initiatives**: e.g., Baltic Earth, BONUS, Black Sea



What are we trying to do?

Regional Earth Science Priorities

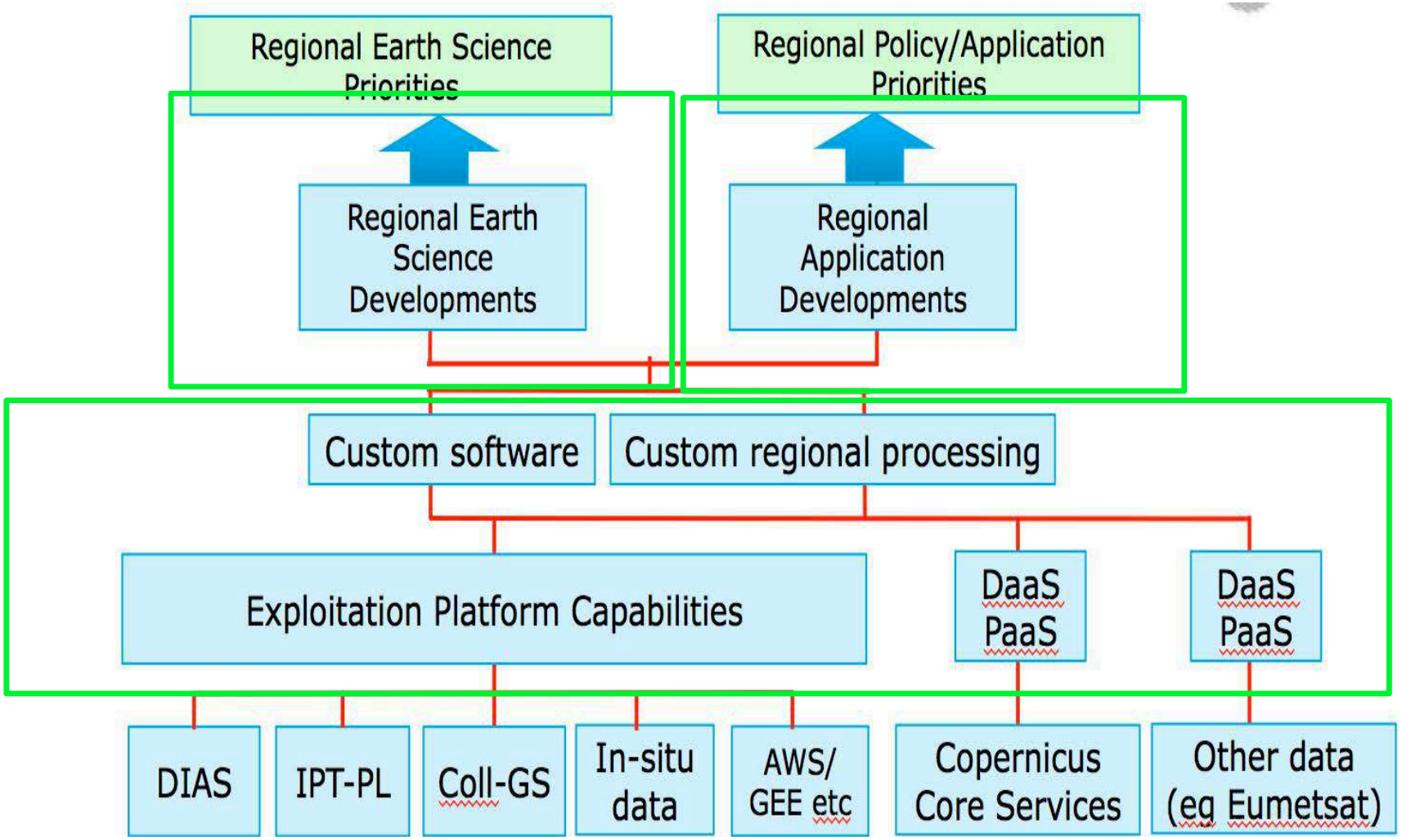
Regional Policy/Application Priorities



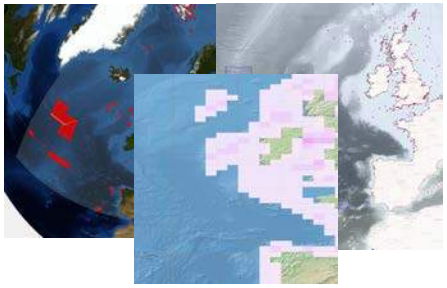
?

DIAS | IPT-PL | Coll-GS | In-situ data | AWS/ GEE etc | Copernicus Core Services | Other data (eg Eumetsat)

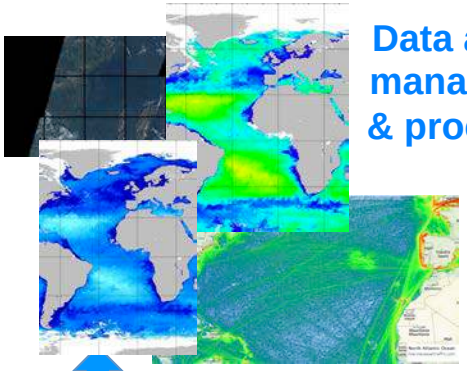
The different bits actually fit together



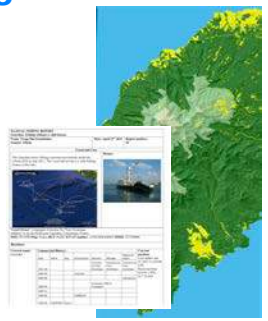
Regional Initiatives



Support to National & Regional Reporting

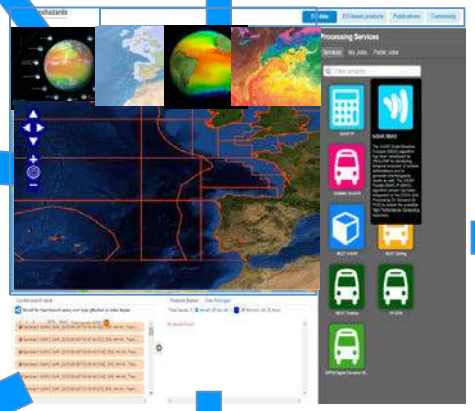


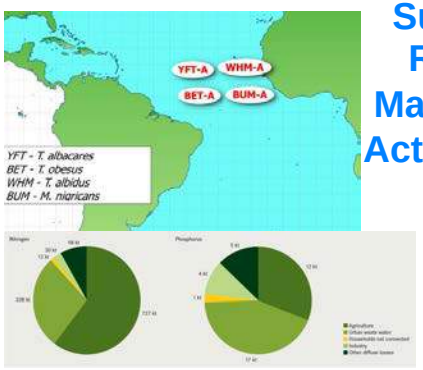
Data access, management & processing



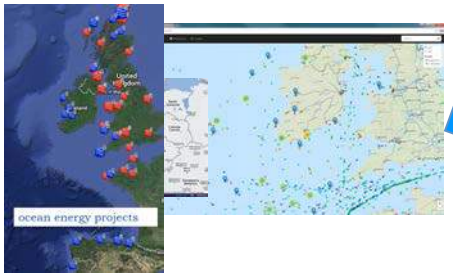
Routine Monitoring & Analysis/ Reference Datasets

Communication, Education and Citizen Engagement

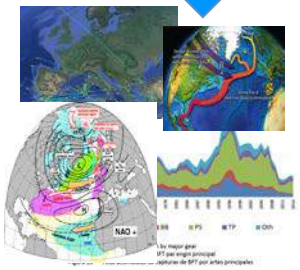




Support to Regional Management Actions/Plans



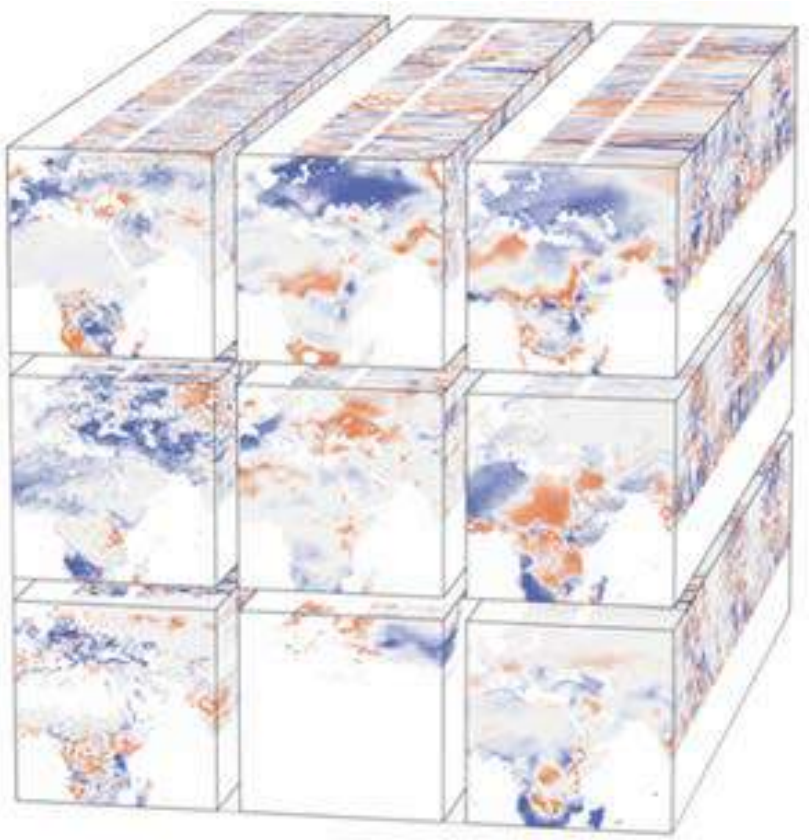
Development of Customized Regional Applications & Services



Support to Cooperative Regional Research

Support to Regional Programmes and Strategies

Enabling technology devleopments



Going forward from here...

Unique opportunity to develop/strengthen national capability

- Support entire range of developments from low TRL initial research to high TRL application operationalization
- Build connections between universities, public sector stakeholders and private sector operators
- Cooperation with ESA means links can be put in place with on-going complementary developments elsewhere in Europe
- Consider a range of possible success factors:
  - Strengthened participation by Maltese entities in global research programmes
  - Increased use of space capabilities by Maltese stakeholders
  - Expanded opportunities in H2020/FP9 and Copernicus (including ESA ITTs for funds delegated by EC!!)
  - Establish critical mass of industrial capability to benefit from eventual ESA membership

Suggestions and advice

- Size of project is sufficient to support focused development and verification/testing – make best use of the resources
- Data access:
  - Does your development require VHR commercial data – if so, does your commercial/operational plan make financial sense based on commercial data prices per km2 and achievable revisit rates?
  - Try to use the lowest cost data possible – your processing effort also costs you
- The best projects will be advancing Maltese interests:
  - Augmented R&D capability that can also support future spin-off
  - Increased economic activity by Maltese entities
  - Maltese stakeholders improving working processes through adoption of new technologies
- Play to your strengths – what are the unexploited advantages inherent to Malta and how can these be built upon?
- Connect to complementary non-EO developments – eg AI/ML, complementary initiatives (smart cities?, sustainable transport?) etc

Thank you

Email: gordon.campbell@esa.int

Earth Observation
A Necessity