COPERNICUS

Europe's eye on Earth

Mauro FACCHINI
Copernicus Services Unit
DG Enterprise and Industry

9 December 2014

Copernicus: dall'informazione satellitare al dato in situ

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Objectives

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"The Union Earth observation and monitoring programme"

Protect people and assets

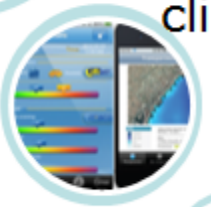
Increase general knowledge on the state of the Planet

Monitor the environment

Improve environmental policy effectiveness

Facilitate adaptation to climate change

Foster downstream applications in a number of fields



Help managing emergency and security related situations

Transfer to operations

European Commission

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From 2000 to 2013:

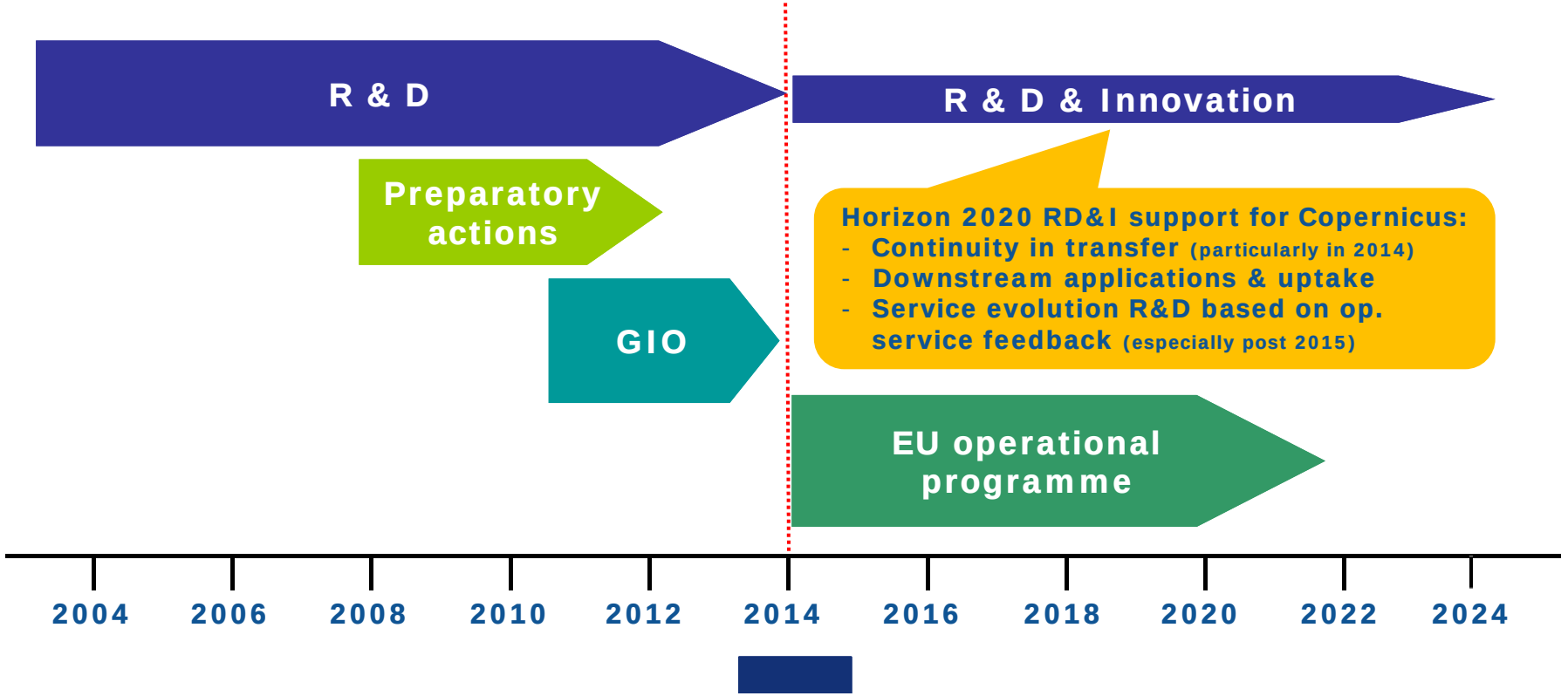
ESA – Space Segment
(ESA + EU budget)
EU – Development of Applications

EU contribution mainly through R&D Budget (FP6,7 …) – annual CALLS, several EU partners

As from 2014 :

ESA – Space Segment
(ESA + EU budget)
EU **Operational budget**
(4,3B€ 2014-2020)

Delegation Agreements, Tenders, Service specifications



GMES / Copernicus Evolution

European Commission

Official Journal of the European Union

L 122

L 122/44 EN Official Journal of the European Union 24.4.2014

REGULATION (EU) No 377/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 3 April 2014

establishing the Copernicus Programme and repealing Regulation (EU) No 911/2010

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Adopted budget appropriations 2014-2020

Space component	**3.394 M€**
Service & In-situ component	**897 M€**

- ✓ Until end-2013 funding for Copernicus comes from GMES **Initial Operations (GIO)** and FP7 funded pre-operational projects
- ✓ From 2014 Copernicus entered its operational phase
- ✓ **24.04.2014** adoption of the Copernicus Regulation – **legal base** for the **implementation of the programme**

Who are the users?

The Regulation (EU) No 377/2014, Article 3(9) describes four categories of Copernicus user's:

- **Copernicus core Users: Union institutions and bodies,** European, national, regional or local authorities entrusted with the definition, implementation, enforcement or monitoring of a public service or policy in the relevant areas**;**
- **Research users**
- **Commercial and Private users**
- **charities, non-governmental organisations and international organisations**

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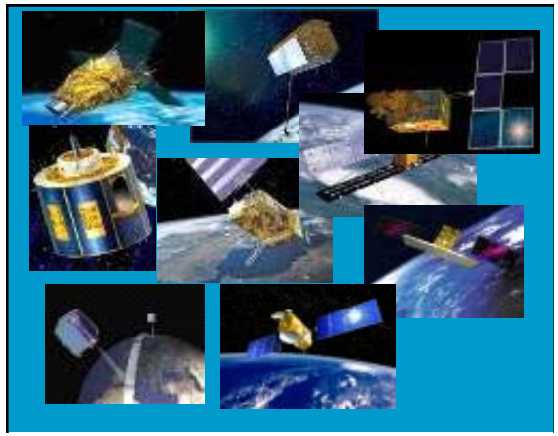
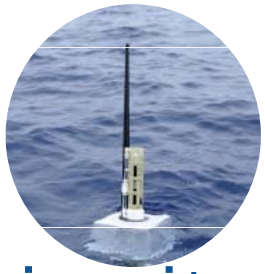
Sentinels

6 services use Earth Observation data to make …



Contributing missions



in-situ

…added-value products

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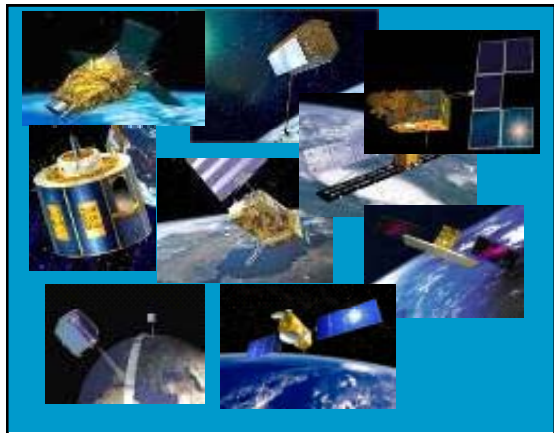
6 services use Earth Observation data to make …



Sentinels

Contributing missions

esa

EUMETSAT

EEA

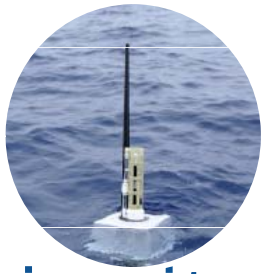
ECMWF

Mercator Ocean
Ocean Forecasters

FRONTEX

EMSA

SatCen



EEA

in-situ

…added-value products

Copernicus – Space Infrastructure

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Six Sentinel missions dedicated to Earth Observation

Each Sentinel is technically different to meet the needs of the 6 services

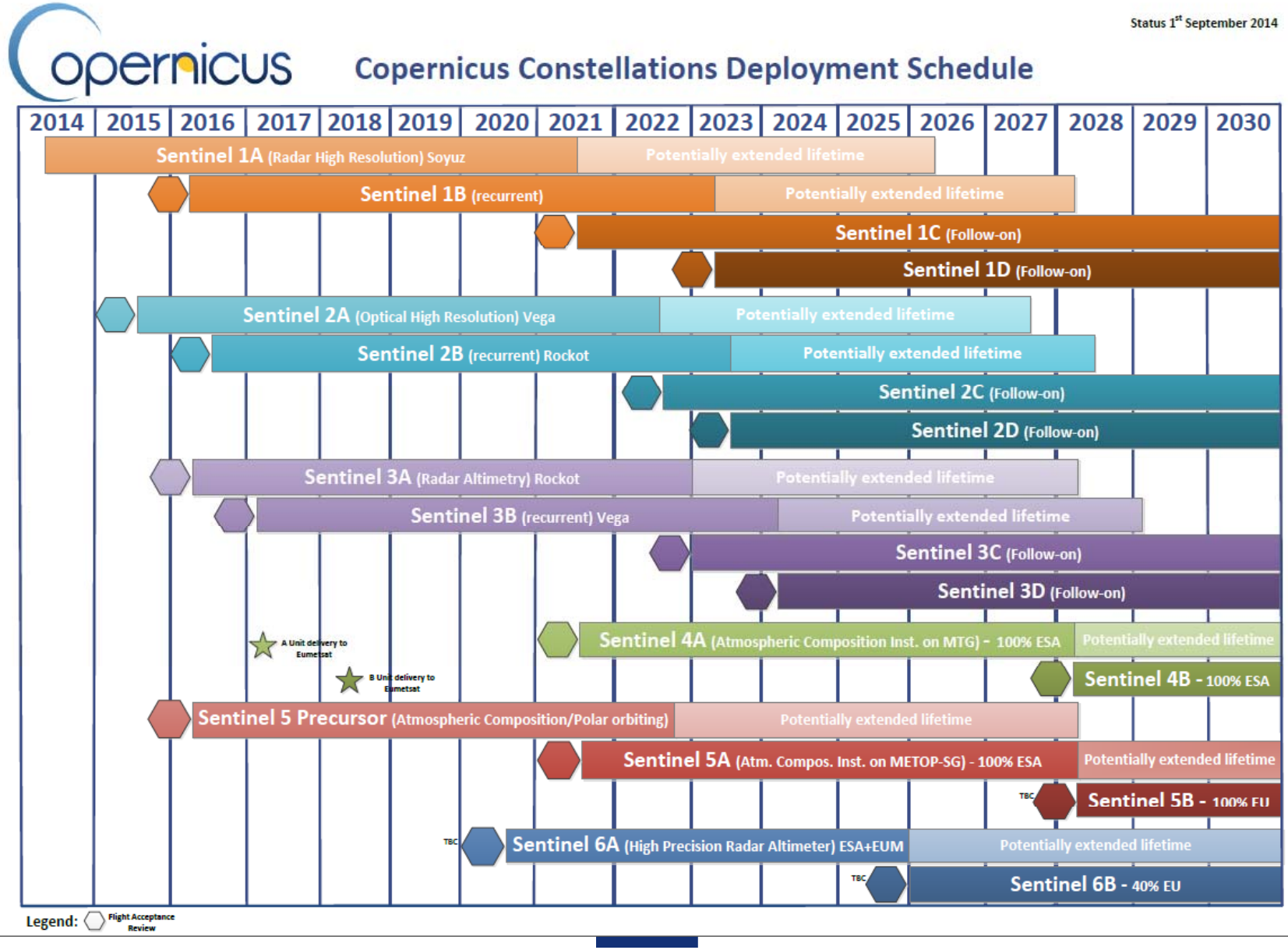
Sentinel 1 – SAR (radar) imaging
All weather, day/night applications

Sentinel 2 – Medium/high resolution optical imaging
Land applications: urban, forest, agriculture,..

Sentinel 3+6 – Ocean and global land monitoring, high precision ocean altimetry

Sentinel 4+5 – Atmosphere composition monitoring, from a geostationary (S-4) and a polar orbit (S-5)

Sentinels


Status 1st September 2014
Copernicus Constellations Deployment Schedule
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Sentinel 1A (Radar High Resolution) Soyuz
Potentially extended lifetime
Sentinel 1B (recurrent)
Potentially extended lifetime
Sentinel 1C (Follow-on)
Sentinel 1D (Follow-on)
Sentinel 2A (Optical High Resolution) Vega
Potentially extended lifetime
Sentinel 2B (recurrent) Rockot
Potentially extended lifetime
Sentinel 2C (Follow-on)
Sentinel 2D (Follow-on)
Sentinel 3A (Radar Altimetry) Rockot
Potentially extended lifetime
Sentinel 3B (recurrent) Vega
Potentially extended lifetime
Sentinel 3C (Follow-on)
Sentinel 3D (Follow-on)
A Unit delivery to Eumetsat
B Unit delivery to Eumetsat
Sentinel 4A (Atmospheric Composition Inst. on MTG) - 100% ESA
Potentially extended lifetime
Sentinel 4B - 100% ESA
Sentinel 5 Precursor (Atmospheric Composition/Polar orbiting)
Potentially extended lifetime
Sentinel 5A (Atm. Compos. Inst. on METOP-SG) - 100% ESA
Potentially extended lifetime
TBC
Sentinel 5B - 100% EU
TBC
Sentinel 6A (High Precision Radar Altimeter) ESA+EUM
Potentially extended lifetime
TBC
Sentinel 6B - 40% EU
Legend:
Flight Acceptance Review

Delegation agreements for infrastructures

European Commission

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esa

Technical coordination and will procure and develop dedicated Copernicus missions

D.A. signed on 28.10.2014

EUMETSAT

Will operate Sentinel -3, -4, -5 and -6 as well as Jason 3 and be committed to process and disseminate the data.

D.A. signed on 07.11.2014

Launch of Sentinel 1-A
3 April 2014

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One of the first images from Sentinel 1A showing glaciers in Antarctica

Copernicus Services

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Copernicus Services Implementation Schedule

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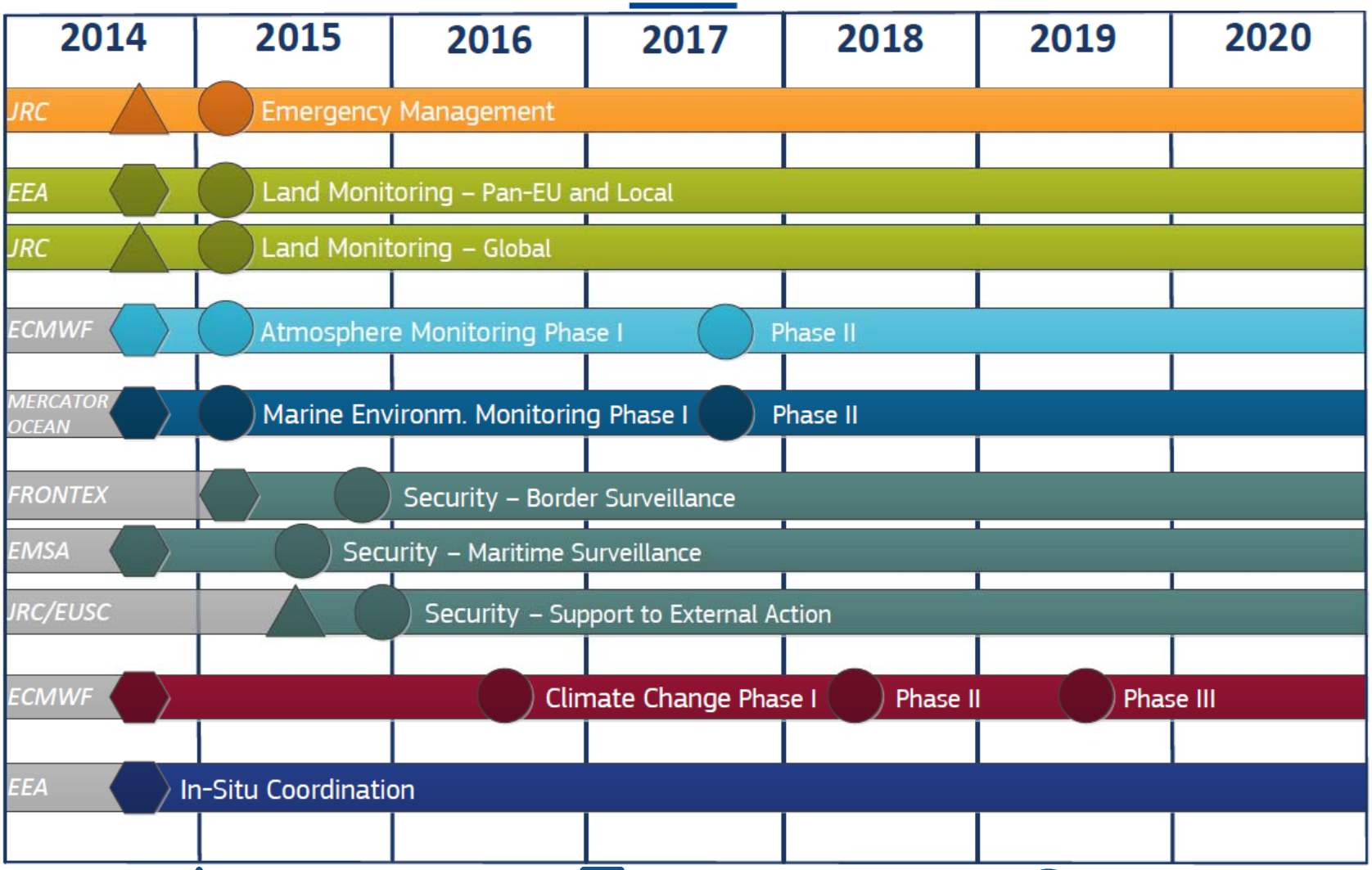

Legend: Direct Management | Delegation Agreement | Operational Phase

Delegation agreements for services

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EEA	Land monitoring – Pan EU & local In-situ coordination	D.A. signed on 01.12.2014
ECMWF	Atmosphere monitoring Climate change	D.A. signed on 11.11.2014 for Atmosphere
Mercator Ocean Ocean Forecasters	Marine Environment monitoring	D.A. signed on 11.11.2014
FRONTEX	Security – Border Surveillance	D.A. foreseen for beginning 2015
EMSA	Security – Maritime Surveillance	D.A. foreseen for beginnig 2015
SatCen	Security – Support to External Actions	"Agreement" foreseen in 2015

Emergency Monitoring Service

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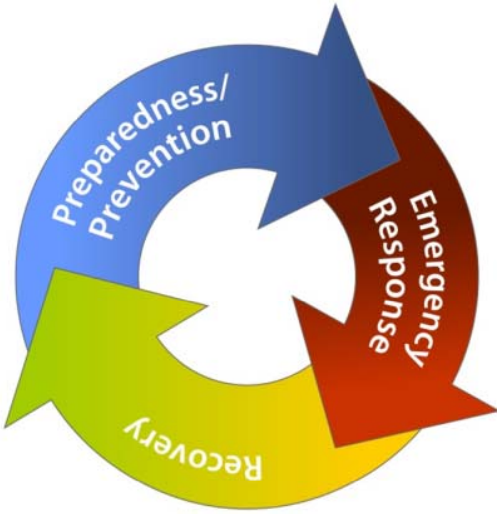
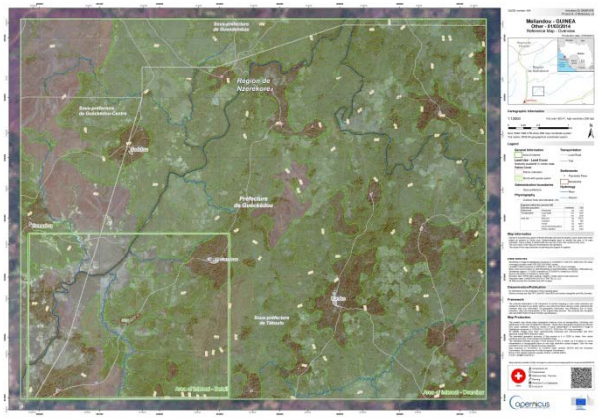
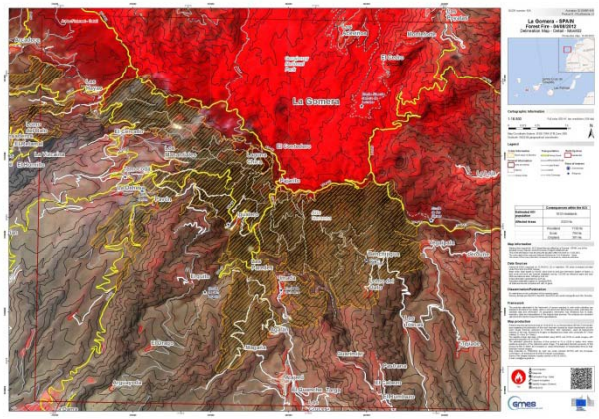


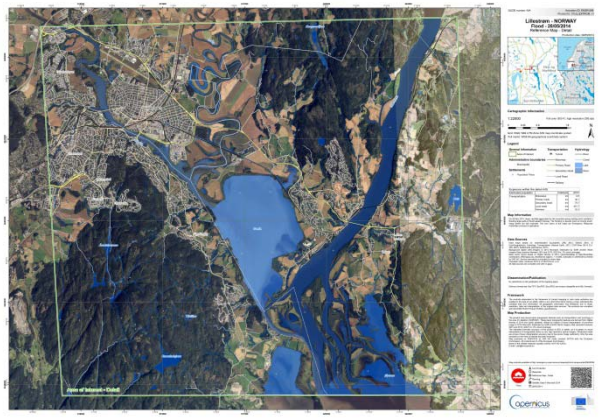


Ebola epidemic, Guinea

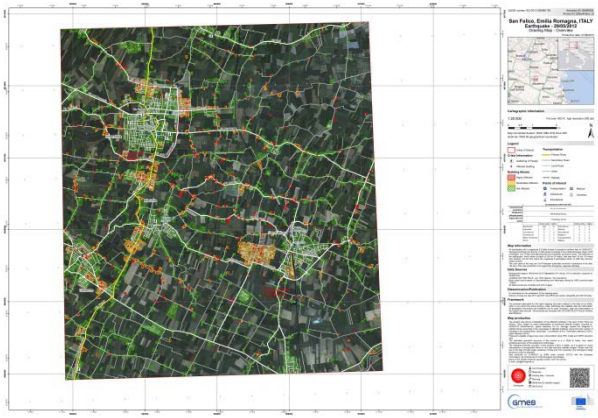


Forest Fire, La Gomera Spain

Refugee Camp, Al Mafraq Jordan



Floods, Ostlandet Norway



Earthquake, San Felice sul Panaro Italy

Land Monitoring Service
EU component

European Commission

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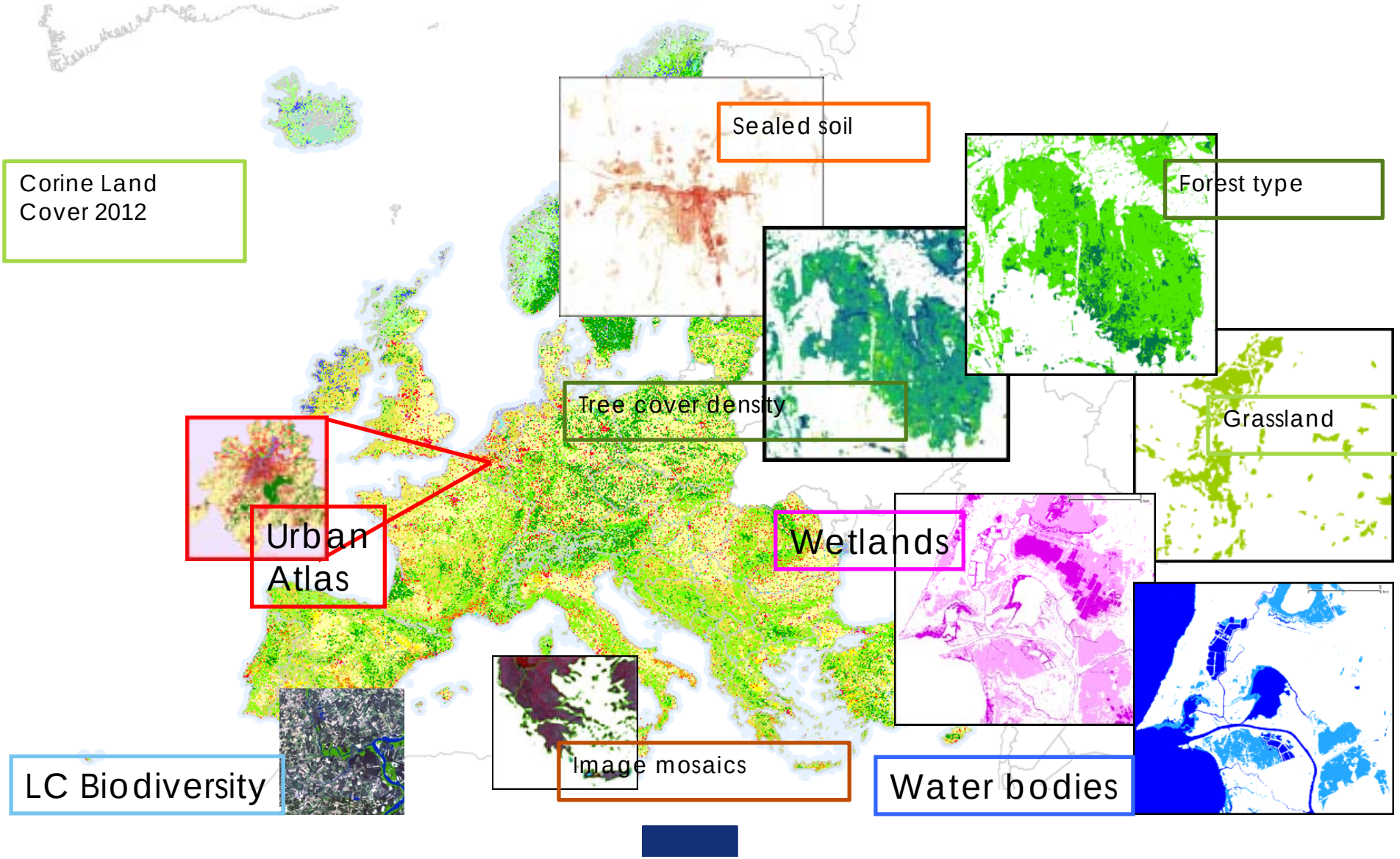

Land Monitoring Service
Global component

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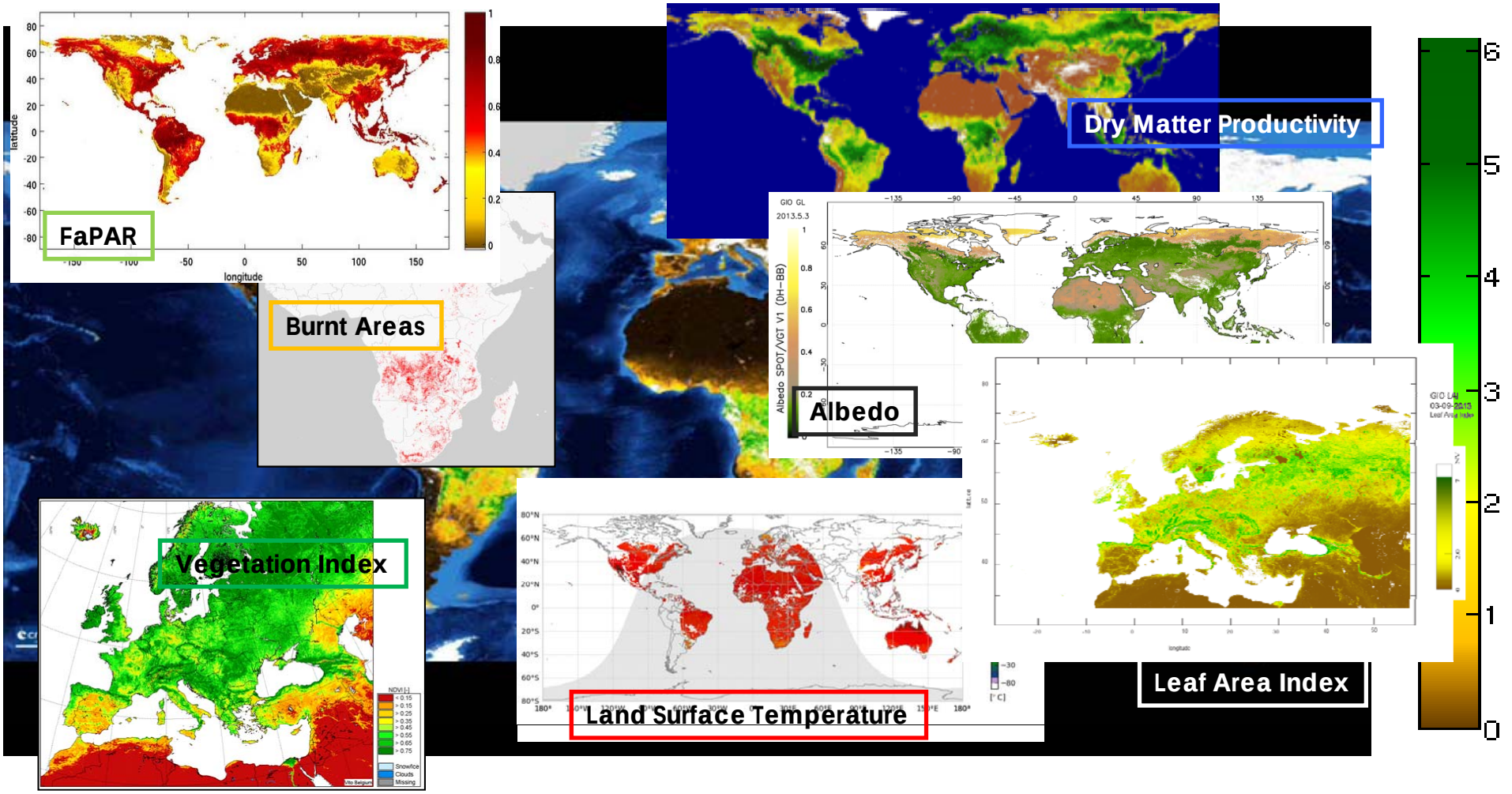

Atmosphere Monitoring Service

European Commission

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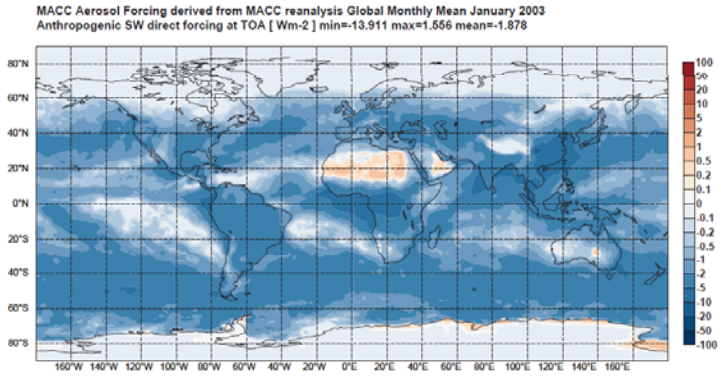
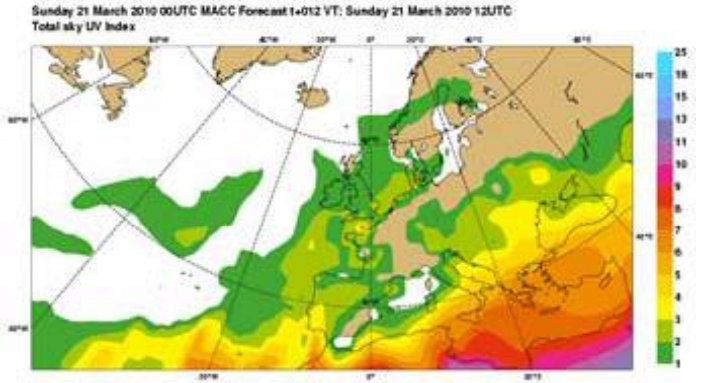
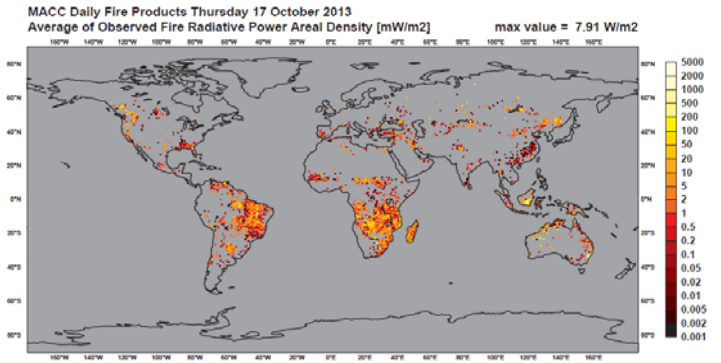
Objective:

To provide information on air quality on EU, national and local scale and of chemical composition of the atmosphere on a global scale.







Service Domains:

- ❑ Air quality & atmospheric comp.
- ❑ Climate forcing
- ❑ Ozone layer and UV
- ❑ Solar radiation
- ❑ Emissions and surface fluxes

Marine Environment Monitoring Service

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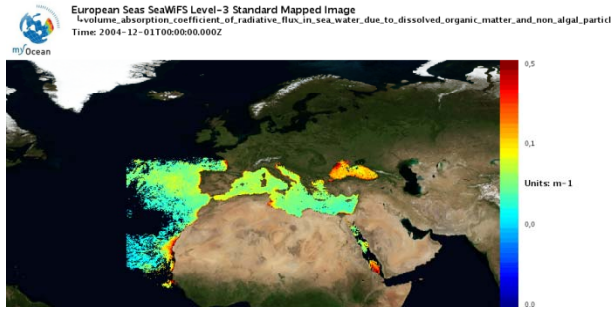
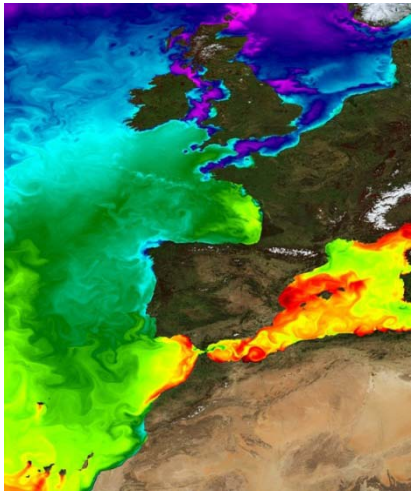
Objective:

To provide information on the state and dynamics of the physical ocean and marine ecosystems for the global ocean and the EU regional areas.

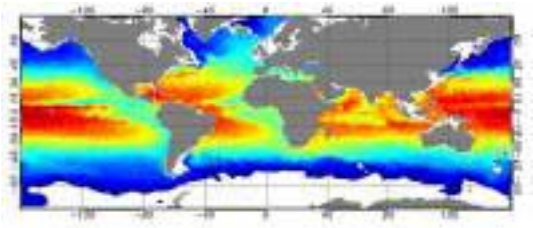
To ensure EU capacity for marine monitoring, forecasting and re-analysis.



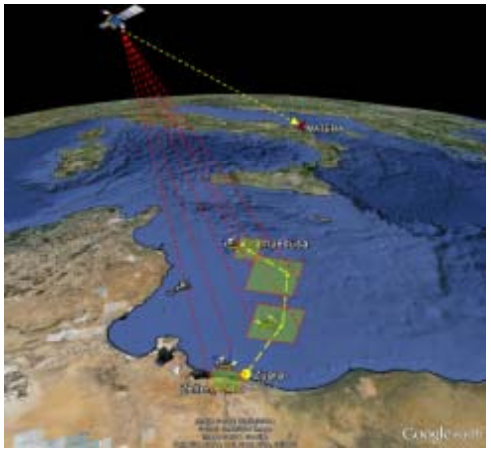


Service Domains:

- ❑ Marine safety
- ❑ Marine & coastal environment
- ❑ Marine Resources
- ❑ Weather, seasonal forecasting & climate



- **Border surveillance**
- **Maritime surveillance**
- **Support to EU External Action**



Climate Change Service

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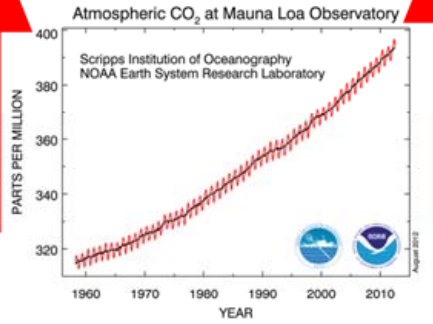
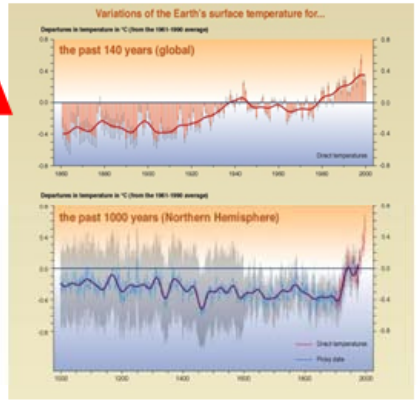
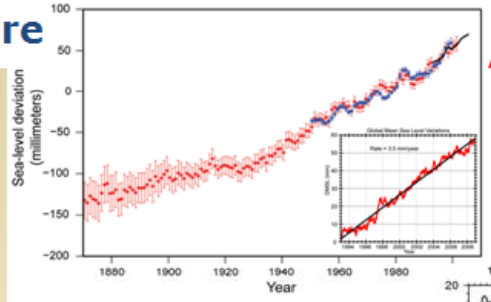
Atmospheric CO2



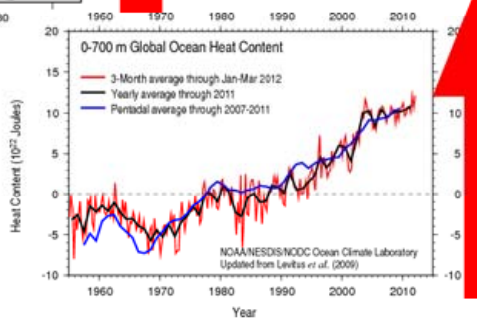
Surface Air Temperature



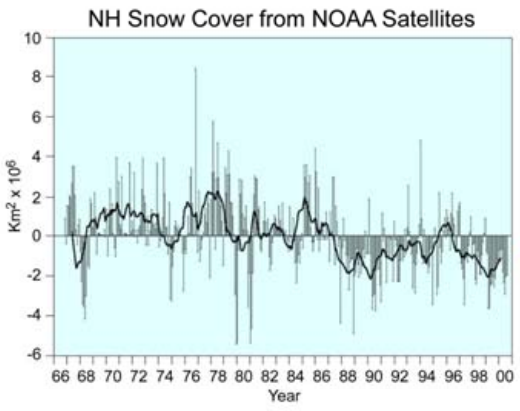
Global Sea Level



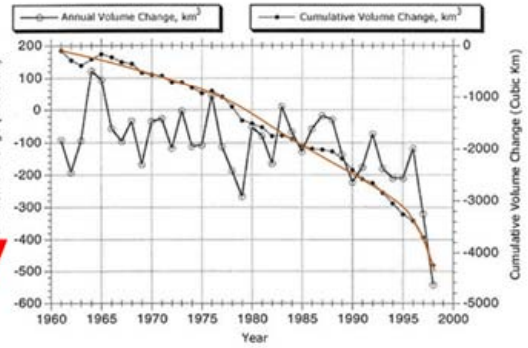
Global Ocean Heat Content



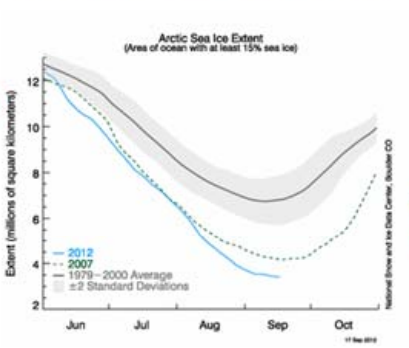
Snow cover



Glacier Volume



Arctic sea ice extent



Climate Change service

European Commission

Provisional timing

Stage 0 - Proof of Concept
Stage I - Pre-Operational
Stage II - Operational ~20 ECVs, ~5 Sectors
Stage III - Operational ~33 ECVs, ~9 Sectors

Data Policy

European Commission

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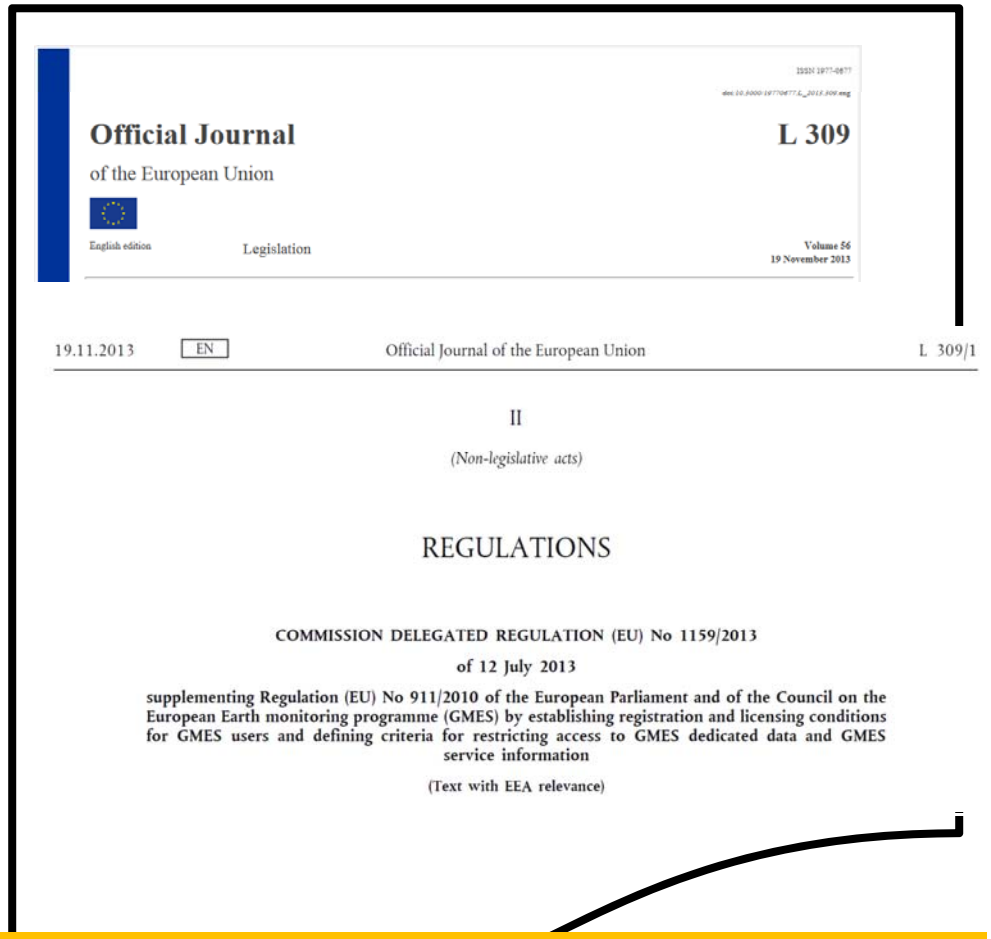
- Data policy promotes the access, use and sharing of Copernicus information and data on a **full, free and open basis – security restrictions may apply**
- One of the main objectives is to support **downstream segment** and research, technology and innovation communities
- ***Business, citizens and environment are to benefit from free access to EU satellite data and service information***



Official Journal
of the European Union
L 309
English edition
Legislation
Volume 56
19 November 2013

19.11.2013 EN Official Journal of the European Union L 309/1

II

(Non-legislative acts)

REGULATIONS

COMMISSION DELEGATED REGULATION (EU) No 1159/2013

of 12 July 2013

supplementing Regulation (EU) No 911/2010 of the European Parliament and of the Council on the European Earth monitoring programme (GMES) by establishing registration and licensing conditions for GMES users and defining criteria for restricting access to GMES dedicated data and GMES service information

(Text with EEA relevance)

Science Community is called upon to make good use of the available data, acting as value multipliers

Job & Growth
Cost-benefit analysis

- ✓ Cost per EU inhabitant will be **~€1.07 per year**
- ✓ Expected cumulative **financial benefit** by 2030 is **~€30 Bn** – comparable to 0.2% of the EU GDP
- ✓ For every €1 spent we get **a return of €3.2**
- ✓ An estimated minimum of **~48,000 jobs** will be created – over the period 2015-2030
- ✓ Estimated downstream market potential turnover will be **~€1.8 Bn** by 2030

European Commission

Thank you for your attention!

http://www.copernicus.eu/

http://ec.europa.eu/enterprise/policies/space/copernicus/index_en.htm

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