

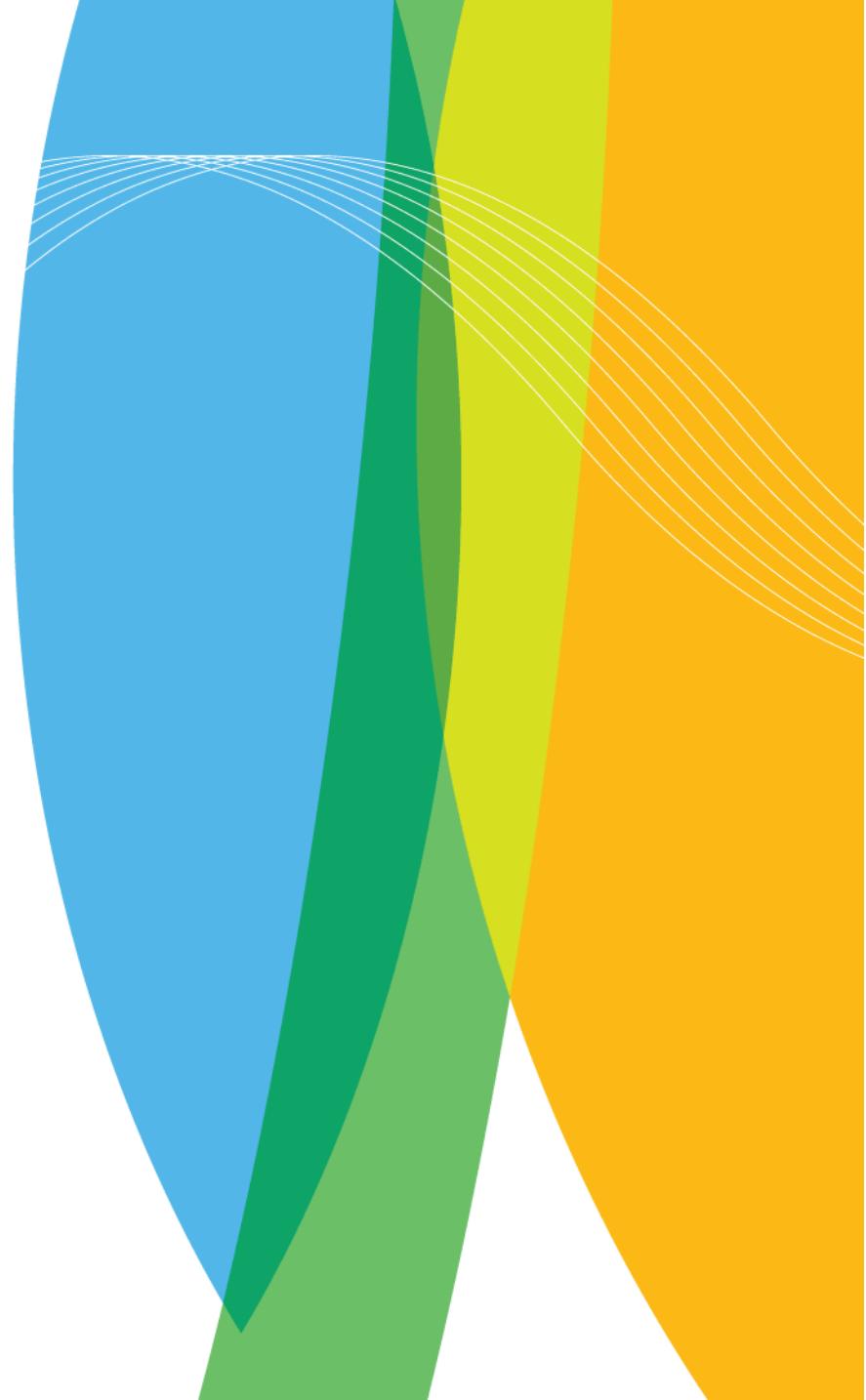


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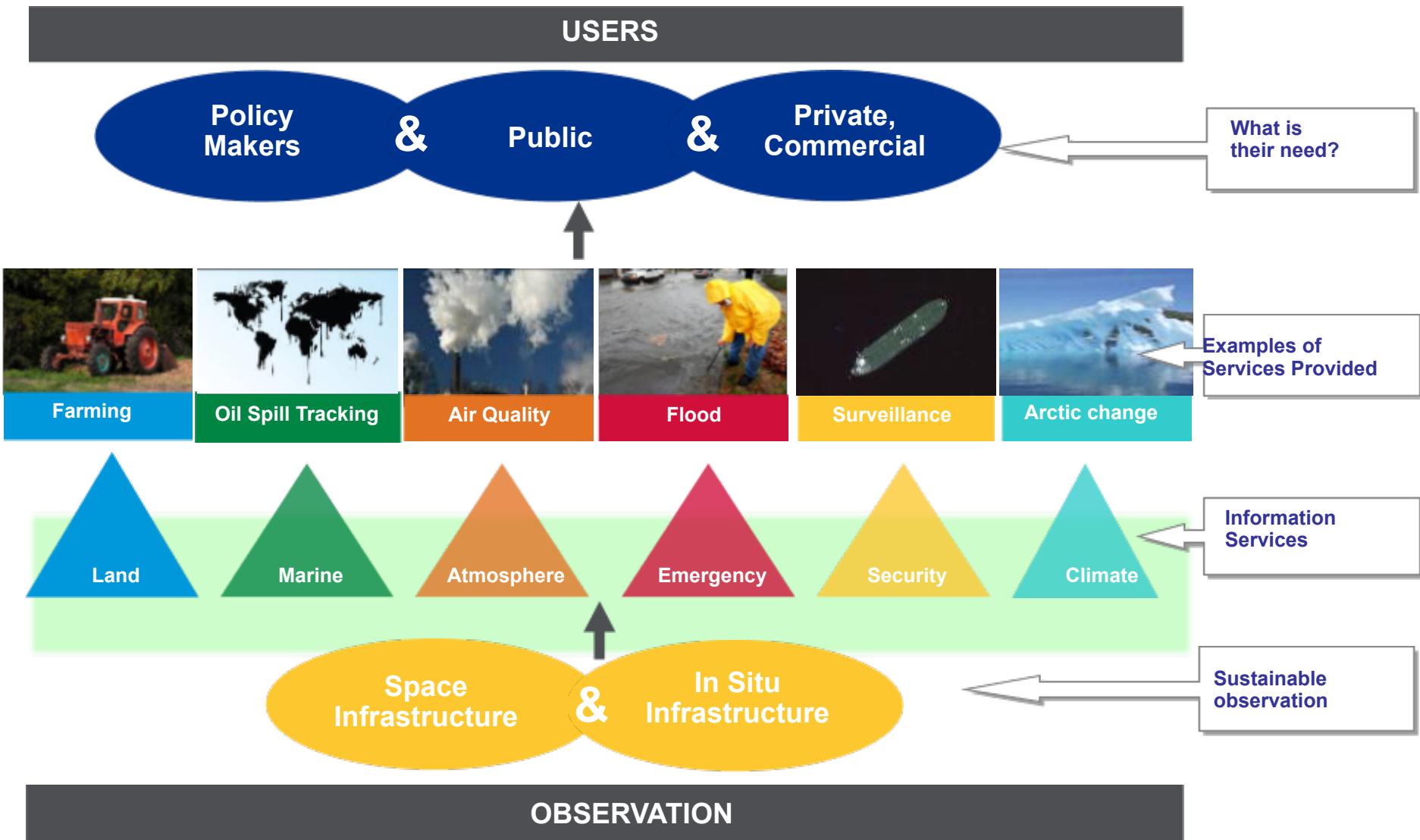
**Copernicus services
and Finland**
<http://copernicus.eu/>

Remote Sensing Days 2014
Helsinki 29.10.2014
Mikko Strahlendorff





Overall view





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Copernicus regulation replaces GMES

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 (=GMES regulation)





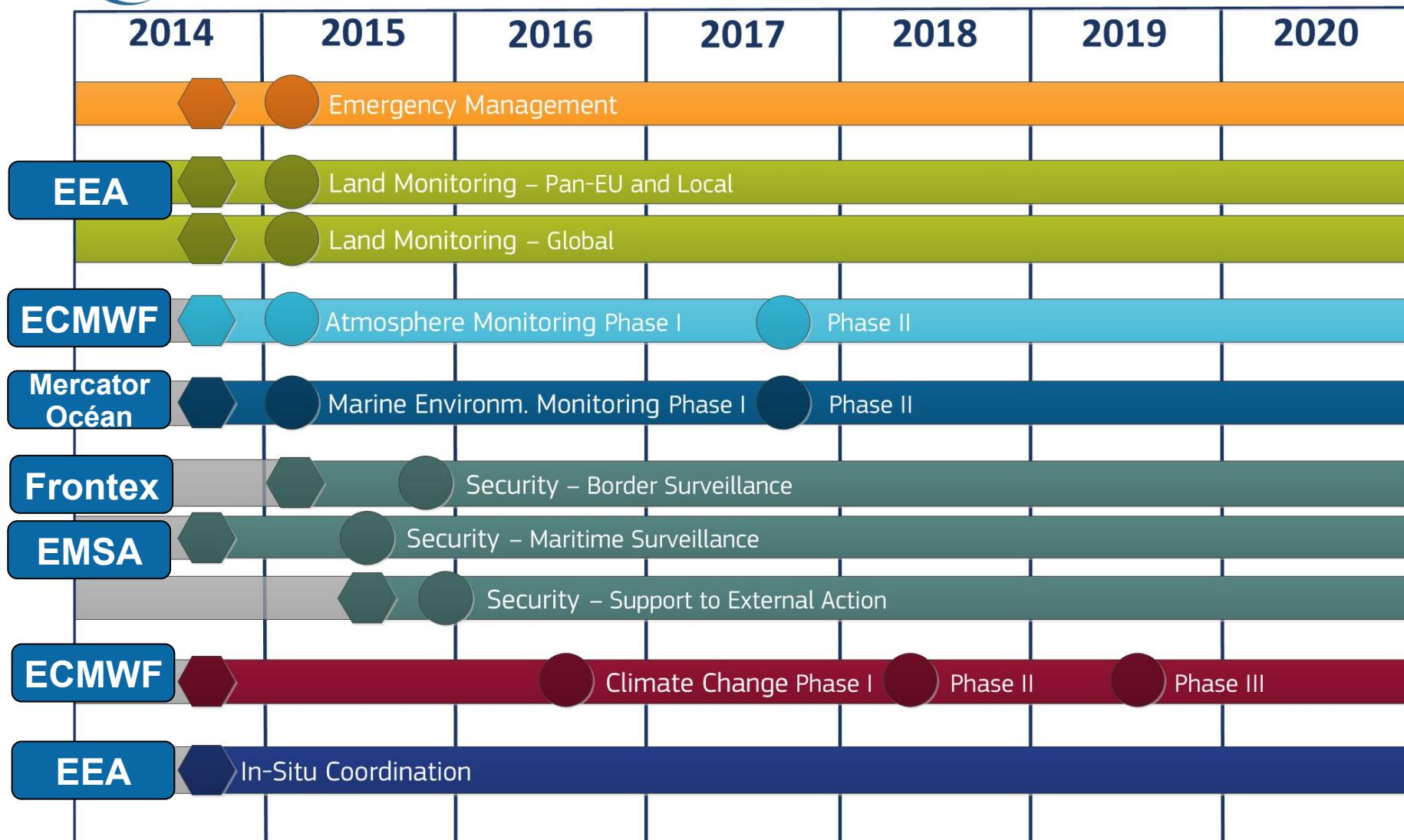
Article 5: Copernicus service component

1. The Copernicus service component shall consist of the following services:

- (a) the **atmosphere monitoring service**, which is to provide information on **air quality on a European scale, and the chemical composition of the atmosphere on a global scale**. It shall in particular provide information for air quality monitoring systems run at the local to national scales, and contribute to the monitoring of atmospheric composition climate variables, including, where feasible, the interaction with forest canopies;
- (b) the **marine environment monitoring service**, which is to provide information on the **state and dynamics of physical ocean and marine ecosystems** for the global ocean and the European regional marine areas, in support of marine safety, contribution to monitoring of waste flows, marine environmental, coastal and polar regions, and of marine resources as well as meteorological forecasting and climate monitoring;
- (c) the **land monitoring service**, which is to provide information on **land use and land cover, cryosphere, climate change and biogeophysical variables**, including their dynamics, in support of the global-to-local environmental monitoring of biodiversity, soil, inland and coastal waters, forests and vegetation, and natural resources, as well as implementation in general of environment, agriculture, development, energy, urban planning, infrastructure and transport policies;
- (d) the **climate change service**, which is to provide information to increase the knowledge base to support adaptation and mitigation policies. It shall in particular contribute to the provision of Essential Climate Variables, climate analyses, projections and indicators at temporal and spatial scales relevant to adaptation and mitigation strategies for the various Union's sectoral and societal benefit areas;
- (e) the **emergency management service**, which is to provide information for **emergency response** in relation to different types of **disasters**, including meteorological hazards, geophysical hazards, deliberate and accidental man-made disasters and other humanitarian disasters, as well as the **prevention, preparedness, response and recovery activities**;
- (f) the **security service**, which is to provide information in support of the **civil security challenges** of Europe improving crisis prevention, preparedness and response capacities, in particular for **border and maritime surveillance**, but also **support for the Union's external action**, without prejudice to cooperation arrangements which may be concluded between the Commission and various Common Foreign and Security Policy bodies, in particular the European Union Satellite Centre.



Copernicus services: Implementation Schedule

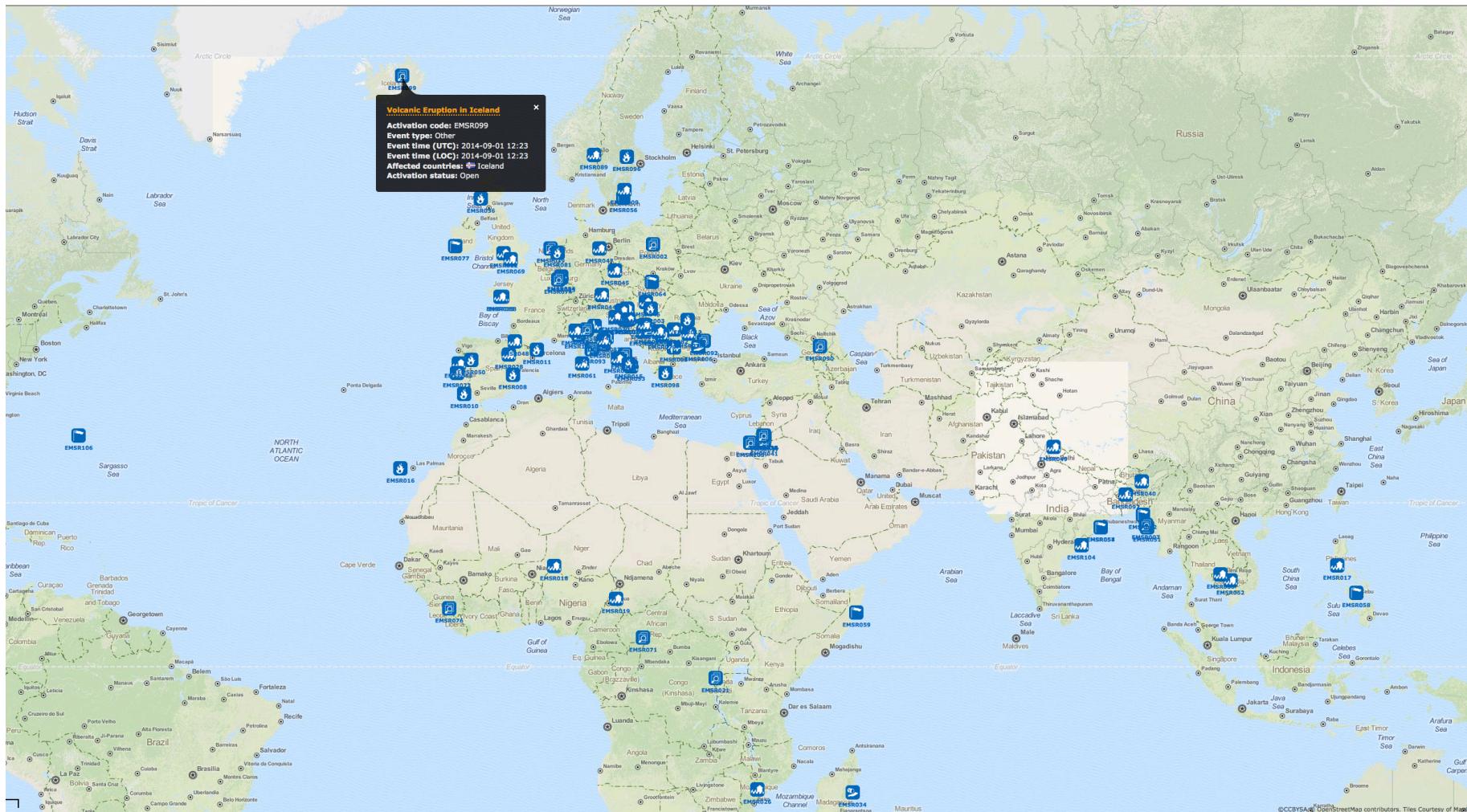




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Emergency management EMS rush activations

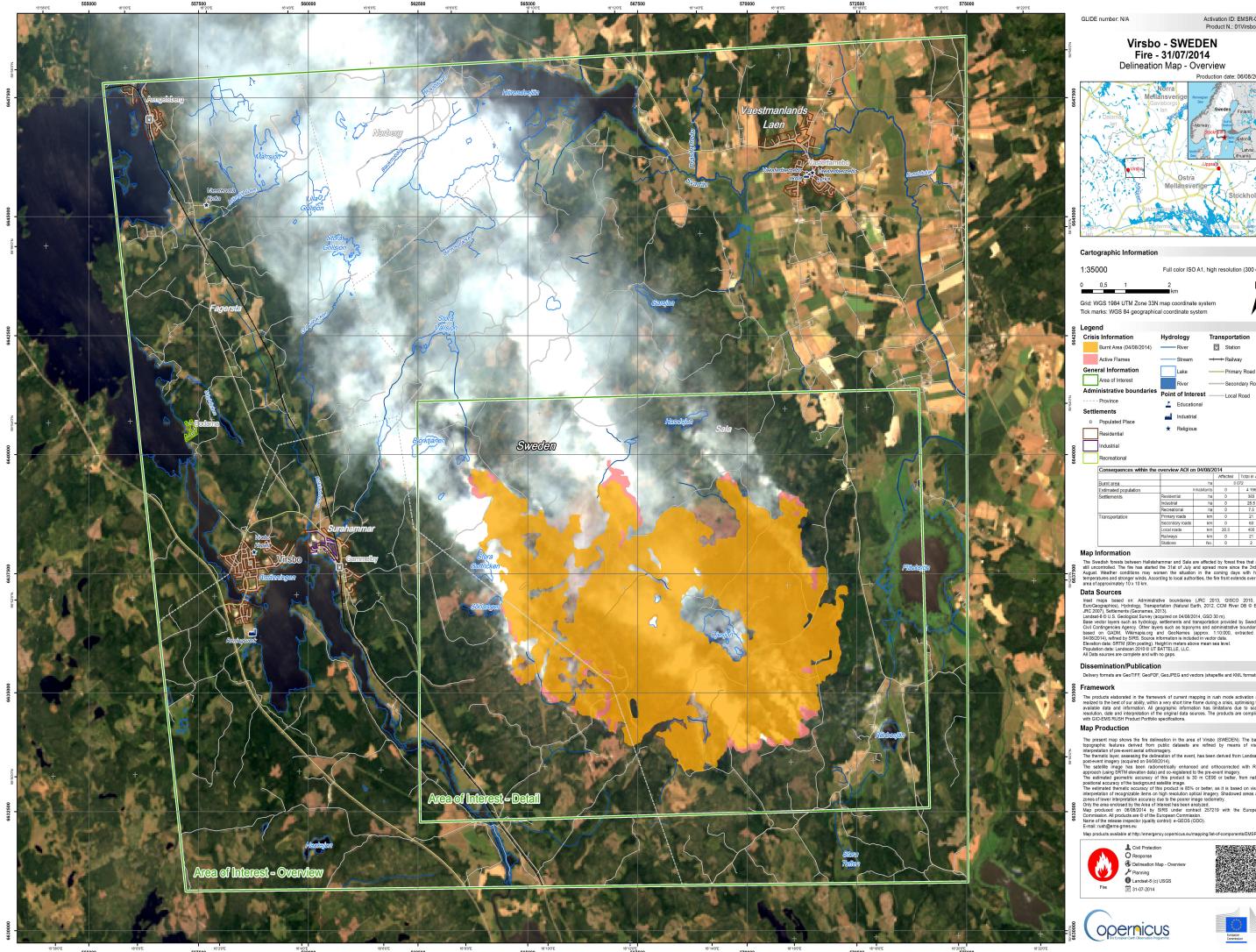




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EMS forest fires in Sweden end July





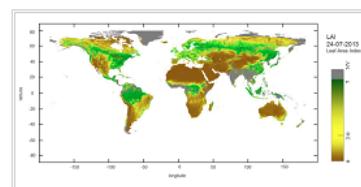
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Land monitoring service - Global

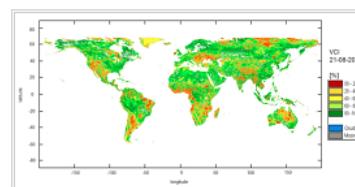
Vegetation State

VEGETATION DYNAMICS



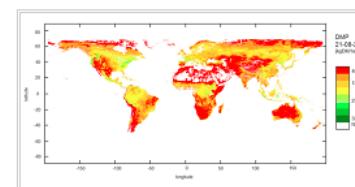
Collections

VEGETATION INDICES



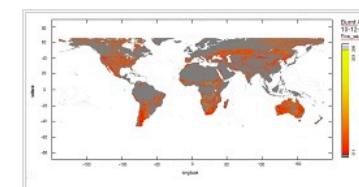
Collections

BIO MASS



Collections

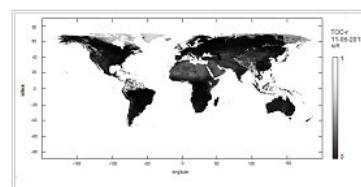
FIRE DISTURBANCE



Collections

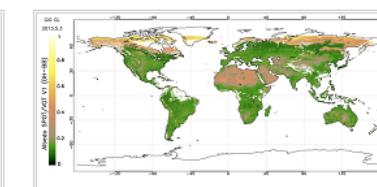
Energy Budget

TOP OF CANOPY REFLECTANCE



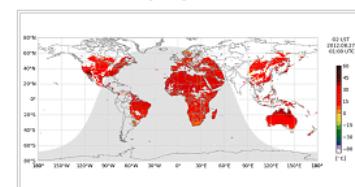
Collections

ALBEDO



Collections

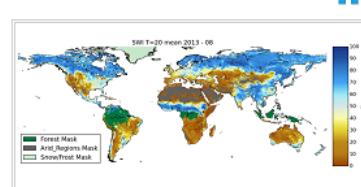
LAND SURFACE TEMPERATURE (LST)



Collections

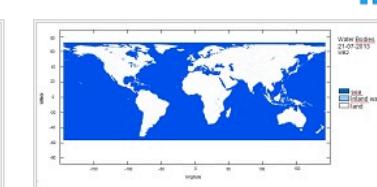
Water Cycle

SOIL WATER



Collections

WATER BODIES

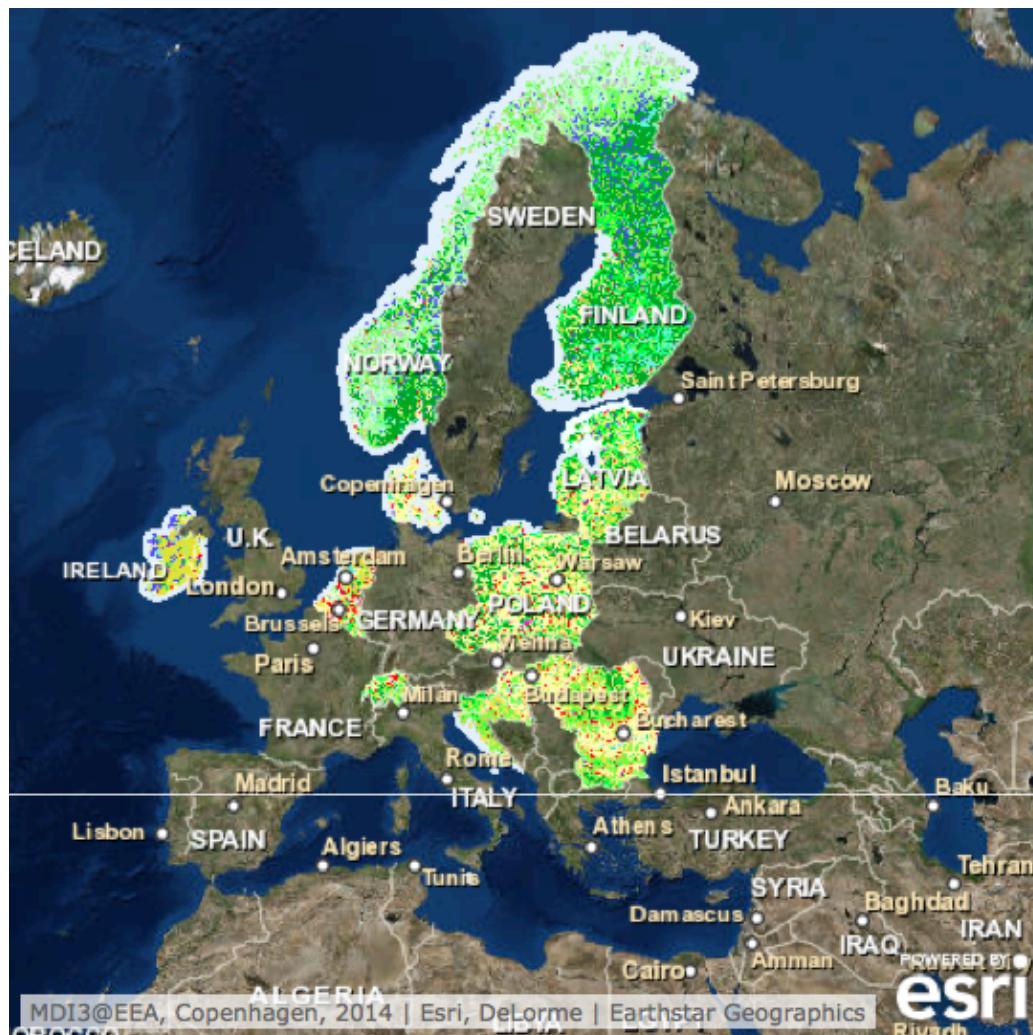


Collections

Finland adds NH snow products in future?



Land monitoring service – Pan-European



- Corine Land Cover 2012
- High resolution layers
 - Imperviousness
 - Forests
 - Grassland
 - Wetlands
 - Permanent water bodies
- Bio-geophysical variables
 - NDVI
- High Resolution image mosaic

Finland validates products



Land monitoring service - Local

Urban Atlas 2006 (4 in Finland)

- Large Urban Zones LUZs with more than 100.000 inhabitants as defined by the Urban Audit.

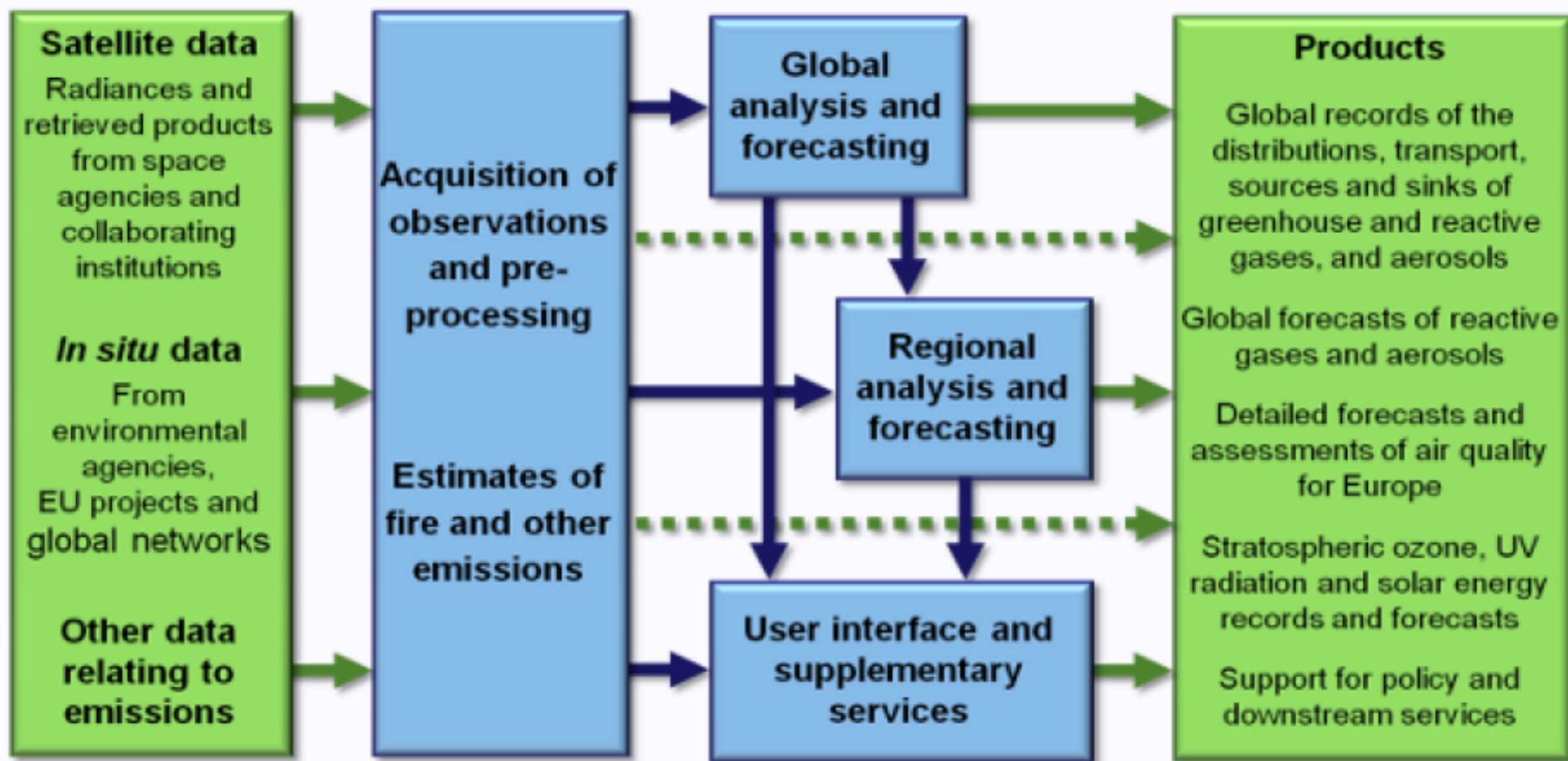
Urban Atlas 2012 (7 in Finland)

- 695 UA 2012 LUZs including 301 existing UA2006 LUZs and 394 new LUZs
- Most EU28 cities over 50,000 inhabitants
- 17 urban classes with MMU 0.25 ha; minor nomenclature changes
- 10 Rural Classes with MMU 1ha





Atmosphere service



Finland involved in model development and European AQ

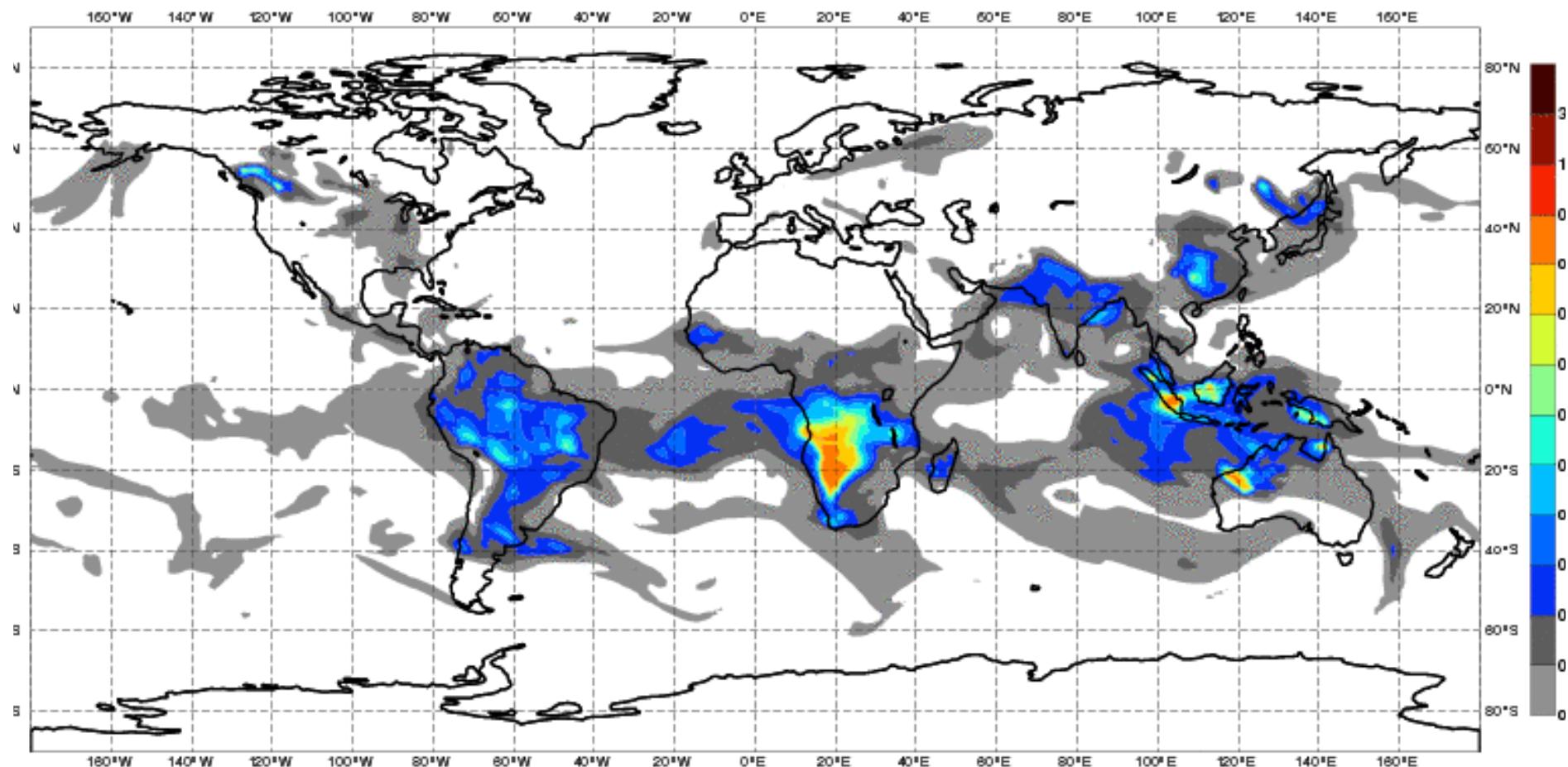


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Atmosphere service - global

Sunday 26 October 2014 00UTC MACC Forecast t+036 VT: Monday 27 October 2014 12UTC
Biomass Burning Aerosols Optical Depth at 550 nm





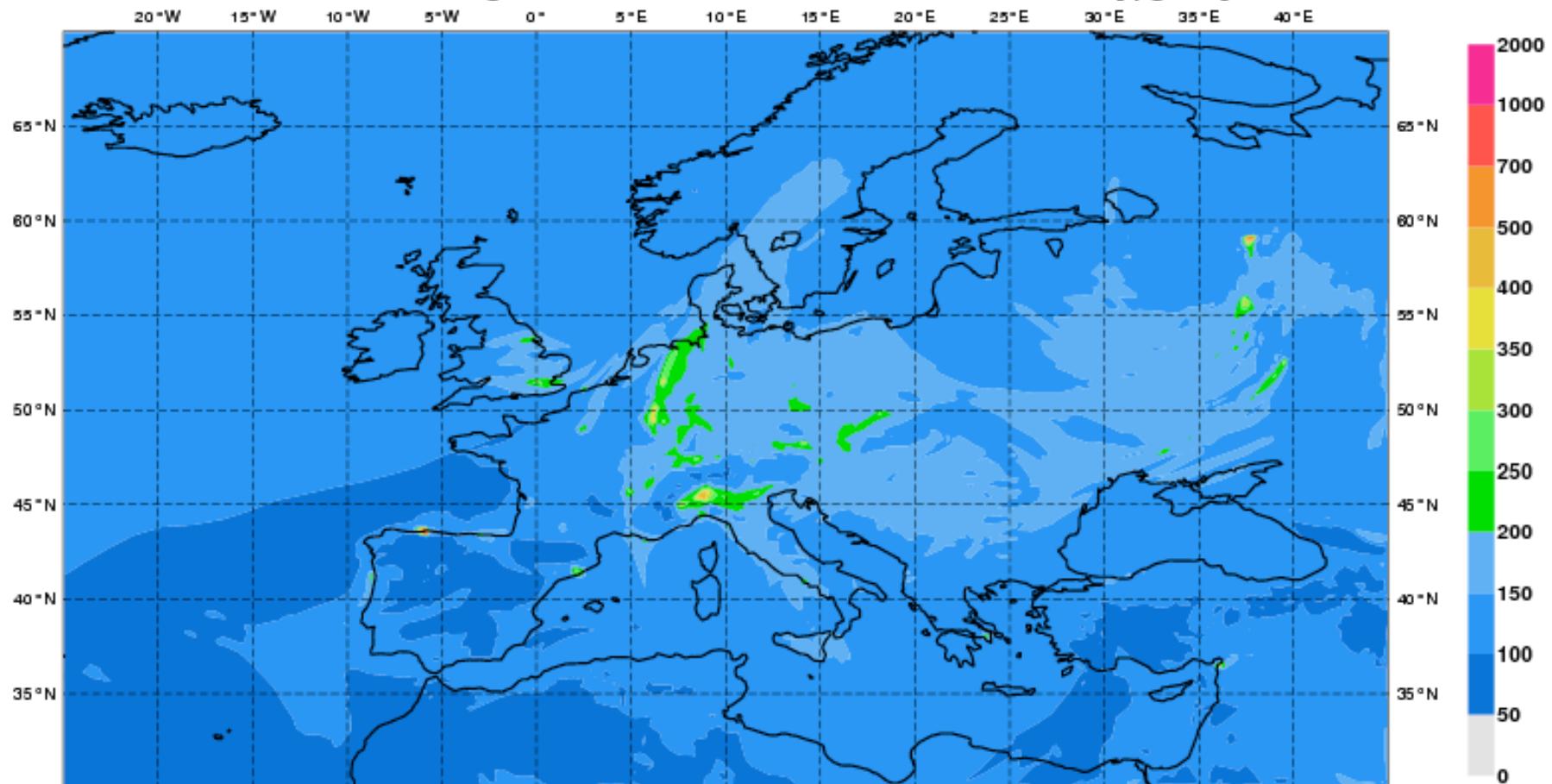
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Atmosphere service – European air quality

Saturday 25 October 2014 00UTC MACC-RAQ Forecast t+000 VT: Saturday 25 October 2014 00UTC

Model: ENSEMBLE MEDIAN Height level: Surface Parameter: Carbon Monoxide [$\mu\text{g}/\text{m}^3$]

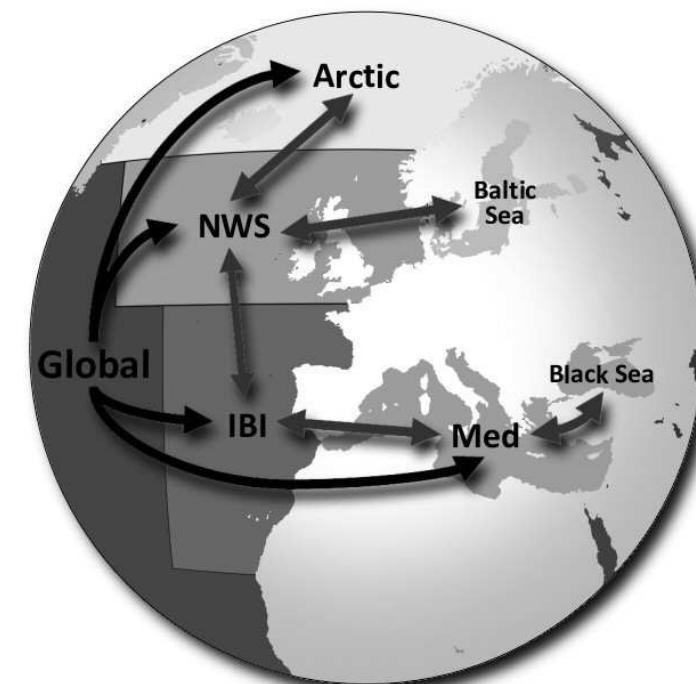
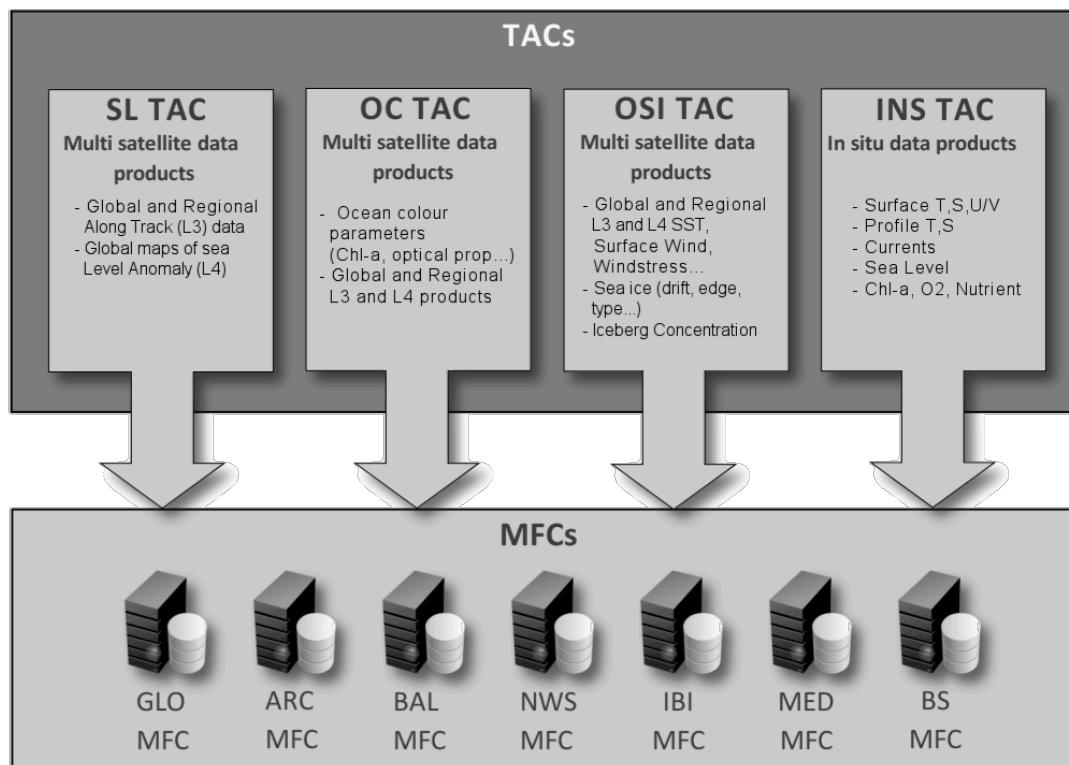




Marine environmental service

Main building blocks

- Thematic Assembly Centres
- Marine Forecasting Centres



- Operational service started September 2014
- French Mercator Ocean manages service for EC

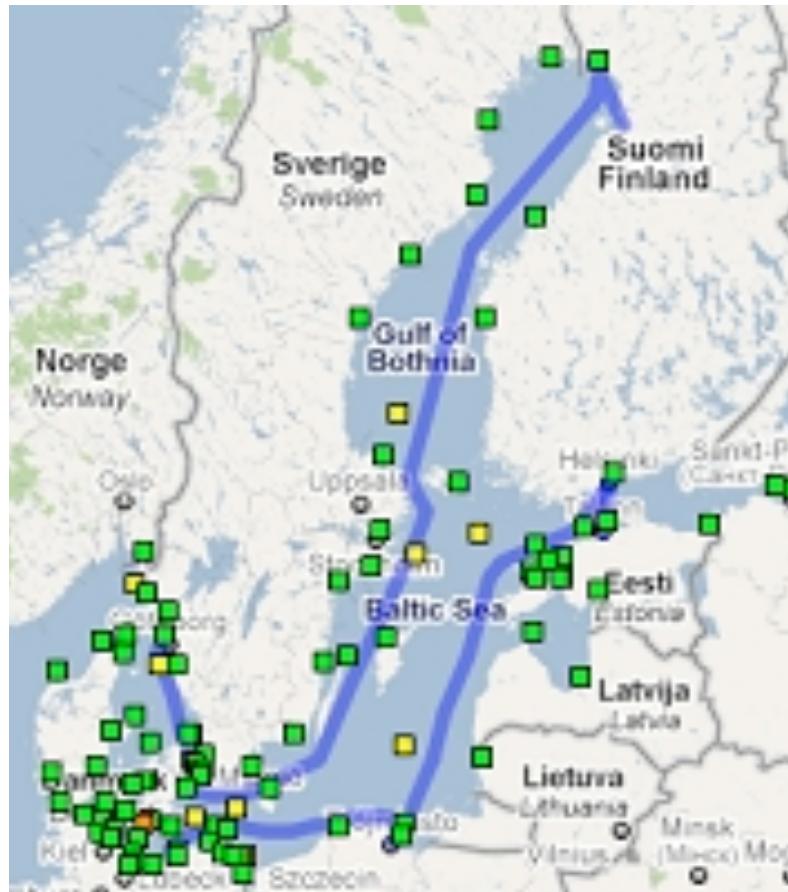


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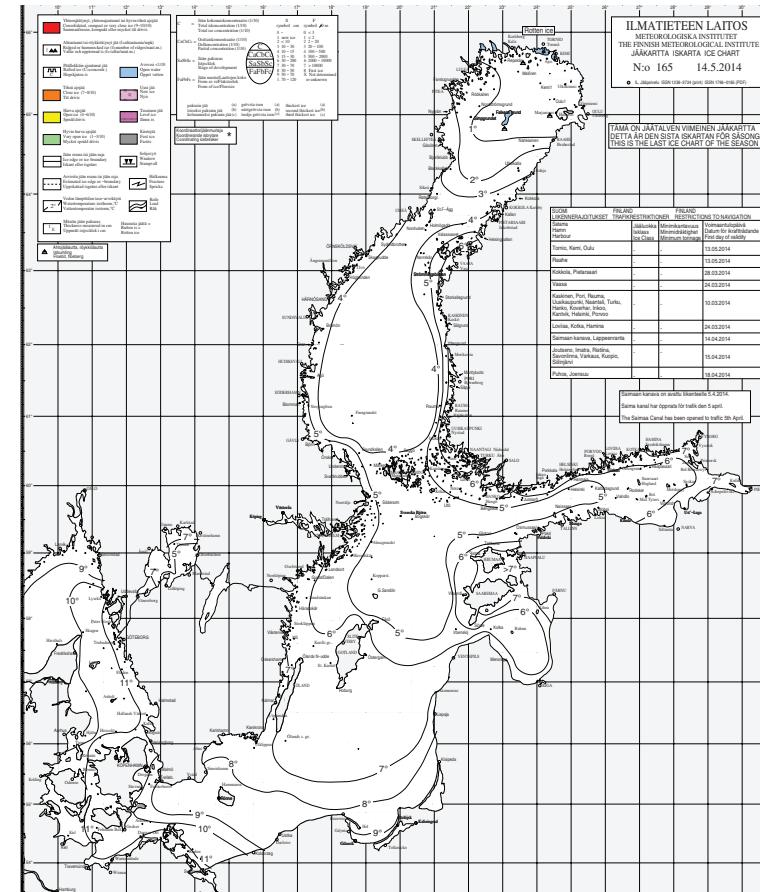


Finland involved in MyOcean1,2,3

Syke provides in-situ data

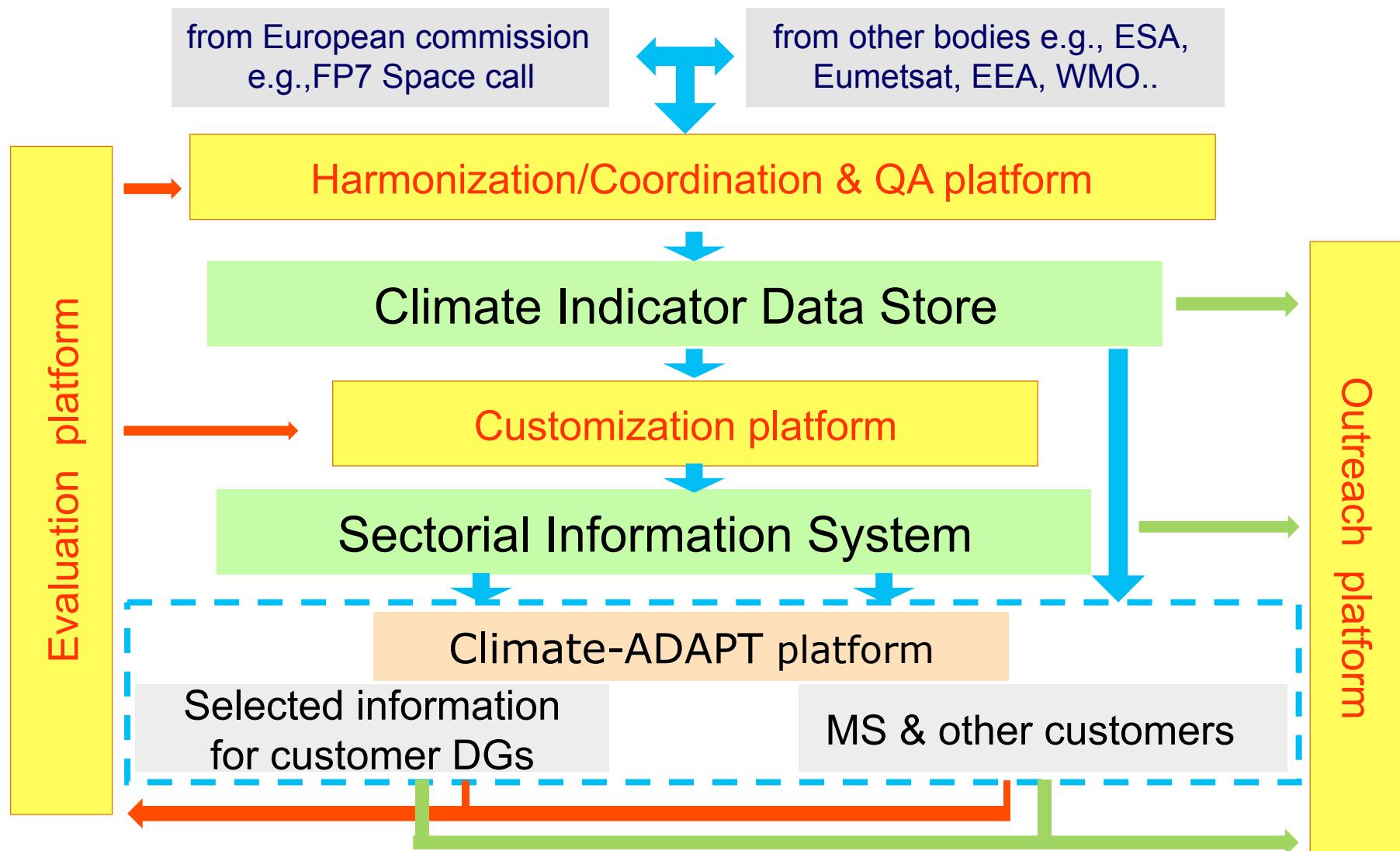


FMI provides sea-ice charts





Climate change service



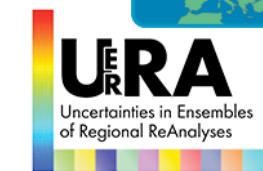


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Climate change service precursors

- **Global reanalysis (FMI) 2014-17**
- **Climate Change information platform (SYKE & FMI) 2014-17**
- **Quality assurance for Essential Climate Variables (no finnish participants) 2014-17**
- **European reanalysis downscaling (no finnish participants) 2014-17**
- **Attribution service (no finnish participants)**
- Coordinating Earth observation data validation for RE-analysis (FMI) 2012-14





SECURITY APPLICATIONS

Preparatory Workshop GMES Security – Jun 2012

- To inform Member States on GMES Security Activities and to seek advise on the way ahead
- Framing document distributed prior to the meeting
- Series of presentations in 3 sessions (available in CIRCA):
 - **Border Surveillance**
 - **Support to External Action**
 - **Maritime Surveillance**
- Detailed discussion in the Working-Groups (BS and SEA)
- About 55 participants / Debate
- Conclusions presented to the User Forum Oct 2012



Security applications

- **Support to EUROSUR (BS)**

GMES BS WG: COM (ENTR, HOME, JRC), Frontex, EUSC, EMSA, EDA, ESA, MS Experts

Concept for EUROSUR, V1.0 of 3.12.2009

Concept of Operations for EUROSUR (CONOPS),

FP7 call 2012 : LOBOS and SAGRES starting 2013

**Main stakeholders: FRONTEX, EMSA, EUSC
(with Industry)**



- **Support to EU External Actions (SEA)**

GMES SEA WG: SGC, RELEX, DEVCO, ECHO, ENER, JRC, ESA, EDA, EUSC, MS Experts Since 2011: EEAS

2010: Identification of User Scenarios

2011: Involvement of EEAS (via CMPD)

2012: (late/early 2013) WG recommendations

2013 (Jan): kick-off of 2 FP7 follow-on projects: G-NEXT and G-SEXTANT

2014 (mid): Detailed operational specifications



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G-Next and G-Sextant





Security applications

- **Maritime Surveillance**
- Mapping of Maritime Surveillance Activities:
 - **FP7**: FP7 : **DOLHIN, NEREIDS, SIMITISYS, PTMAR**
 - **ESA**: **MARISS**;
 - **EDA**: **MARSUR**;
 - **EMSA**: Operations and R&D
 - Coordination by Maritime Projects Coordination Board (**PCB**)
- What else could be done in the area of Maritime Surveillance?
 - (e.g. anti-piracy/smuggling, fisheries control, monitoring illegal waste dumping)
- Holistic approach needed to improve cost/benefit ratio
- Governance issues at stake
 - different geometries across Member States
 - fragmentation of user communities;
- Europe is still working on an integrated Maritime Strategy
 - Identification of requirements through CISE;
 - EDA to revitalise
 - Identification of requirements for the Defence (UK)



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**Thanks for your attention!
What service do you use yourself?**

Please twiit it with #FinRSD2014!

Wanna checkout stuff afterwards?

Mikko.Strahlendorff@fmi.fi