

GMES - Update



Dr. Dirk Geudtner
GMES Bureau
European Commission



GMES in a nutshell

- **Global Monitoring for Environment and Security (GMES) is an EU-led program aiming at providing operational user services based on satellite Earth observation and in-situ data**
- **GMES provides relevant information to policy-makers, institutional EU + MS authorities, and local/regional users**
- **A flagship of the European Space Policy**
 - **An optional program of the European Space Agency**
 - **An EU Program Regulation**
- **Builds on existing capacities**

European Actors

- European Union (EU – Lisbon Treaty)
 - European Commission
 - European Parliament and Council of the EU
 - EU agencies: European Environment Agency (EEA), etc.
- European Space Agency (ESA)
- Other intergovernmental agencies
 - European Organization for Operational Satellite Meteorology (EUMETSAT)
 - European Centre for Medium Weather Forecasting (ECMWF)

GMES Program Regulation

- Adopted by Council and European Parliament on 13/09/2010
- Entry into force

20.10.2010

EN

Official Journal of the European Union

L 276/1

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(Legislative acts)

REGULATIONS

REGULATION (EU) No 911/2010 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 22 September 2010

on the European Earth monitoring programme (GMES) and its initial operations (2011 to 2013)

(Text with EEA relevance)

- Commission to implement, two major packages ongoing:
 - Set up and implement governance
 - Prepare and implement Work Programme 2011

GMES Architecture

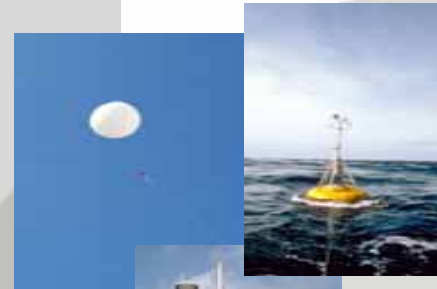
Space Component – coordinated by ESA

- Sentinels (1-5)
- Contributing Missions – data access



In-situ component – coordinated by EEA

- Observations mostly within national responsibility, with coordination at European level
- Air, sea- and ground-based systems and instrumentations

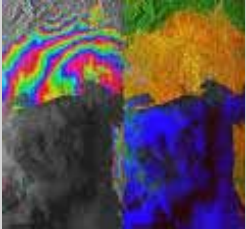


Service component – coordinated by EC

- Mapping and forecasting services: Land, Marine, Atmosphere, Emergency
- Current priorities to develop: Security and Climate Change



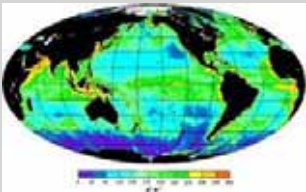
GMES Space component



- **Sentinel 1 – SAR imaging & Interferometry**
 - All weather, day/night applications, interferometry; for vessel detection, oil spills etc.
 - First launch 2012



- **Sentinel 2 – Multispectral imaging**
 - for land applications, e.g. urban, forest, agriculture, etc.
 - First launch 2012



- **Sentinel 3 – Ocean & Land monitoring**
 - Wide-swath ocean color, vegetation, sea/land surface temperature, ocean altimetry
 - First launch 2012

Sentinel 4 – Geostationary atmospheric

- Atmospheric composition monitoring, transboundary pollution
- First launch 2017 on EUMETSAT MTG-S

- **Sentinel 5 – Low-orbit atmospheric**

- Atmospheric composition monitoring
- Precursor launch 2013, S5 first 2020 on EUM Post-EPS



Main Goal: operational Services

- **GMES services – EU/public supported**
 - Provide standardized common (multi-purpose) information for Europe
 - Requested by the EU: link with European information needs
 - ‘Public good’ data policy: Open access and free licensing
- **Downstream services – regional/local & commercial**
 - Tailored for specific applications at local, regional, national levels (public good or private use)
 - EU encourages and supports the implementation of these service layers (i.e., innovation & development)
- R&D component to create and continuously improve operational services

GMES Services

Monitoring of Earth systems



Land



Marine



Atmosphere

Horizontal applications



Security



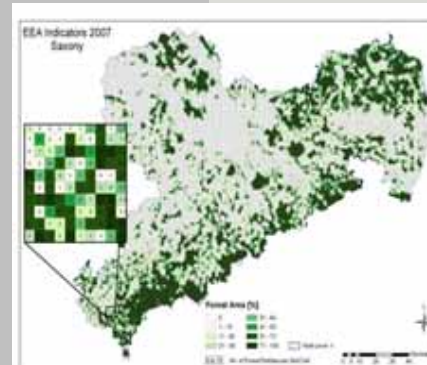
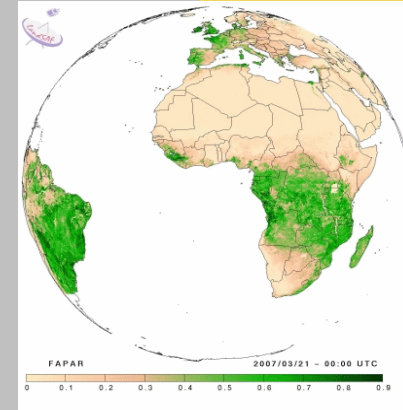
Emergency



Climate Change



- Land services address a broad range of EU policies and users (land use planning, forestry, water, agriculture etc.)
- Stepwise approach:
 - « **multi-purpose** » **products** common to many users and applications (1st priority): 3 components
 - **Global** : Essential Climate Variables (ECVs), bio-and geophysical parameters in support to Climate Change monitoring
 - **Continental** : Pan-EU products (e.g. Pan-EU land cover and land cover change, EU-DEM)
 - **Local** : zooming on 'hot spot' (e.g. urban areas, protected area, coastal areas etc.)
 - **thematic products** at EU or International level (e.g. water quality/quantity models, crop forecasts, environmental indicators etc.)





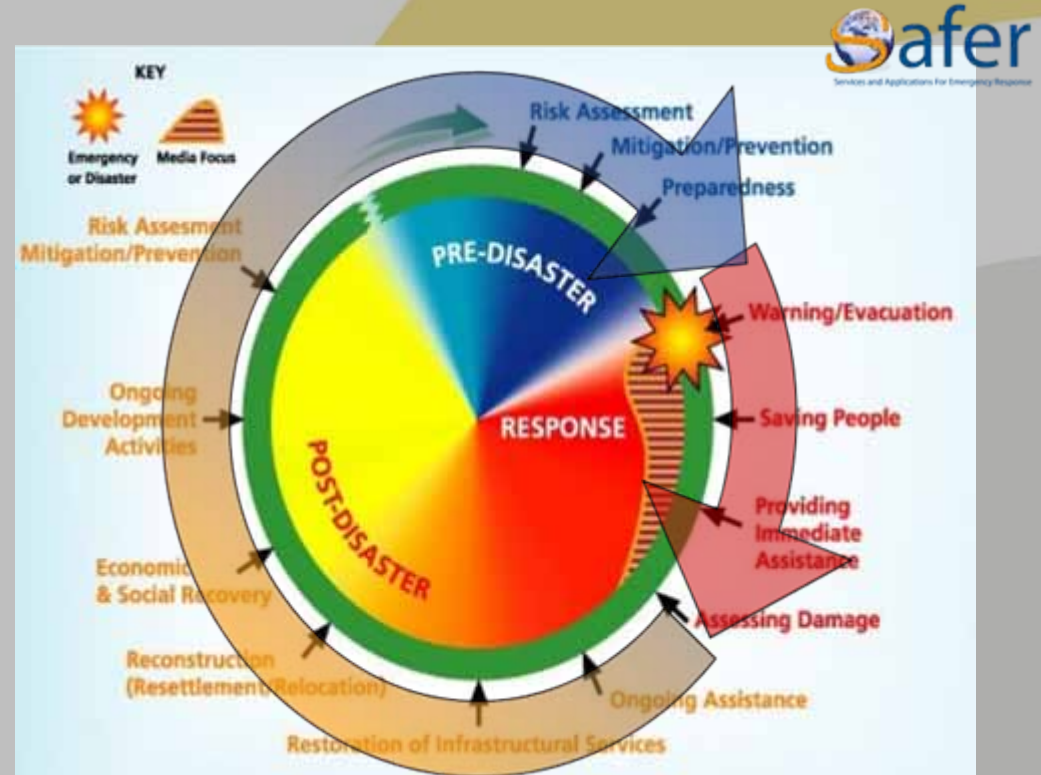
- Initial scope: rapid mapping and emergency response

Emergency Response

Natural disasters: floods, tsunamis, earthquakes, landslides, storms, volcanic eruptions

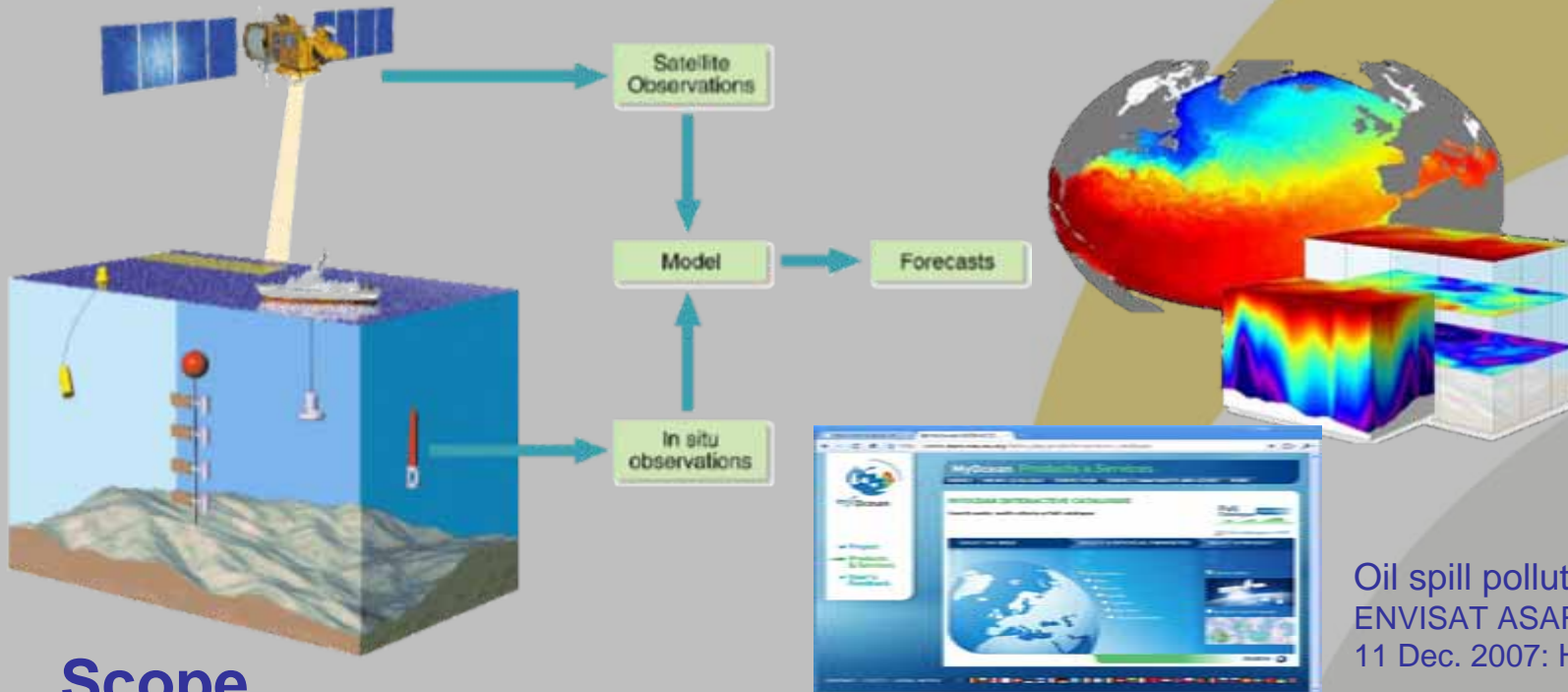
Man-made disasters: industrial and chemical hazards

Humanitarian crisis



Haiti, Port-au-Prince
Damages per district on January 13, 2010

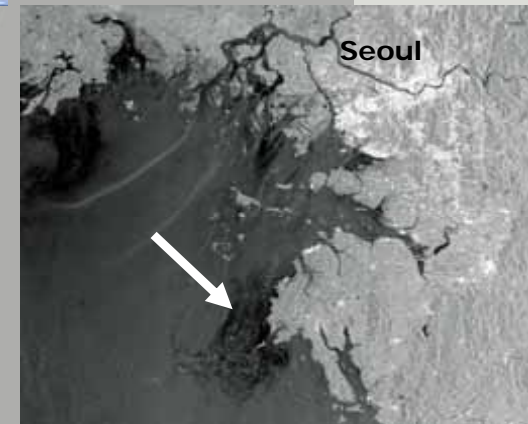
Goal: Services shall cover the entire disaster cycle



Scope

- Global ocean & main European regional seas (Baltic, Med, NE Atlantic, Black Sea, Arctic)
- Physical ocean state
- Re-analysis of data time series for deriving marine Essential Climate Variables (ECVs)

Oil spill pollution monitoring
ENVISAT ASAR image
11 Dec. 2007: Hebei Spirit tanker





Scope

Global & European

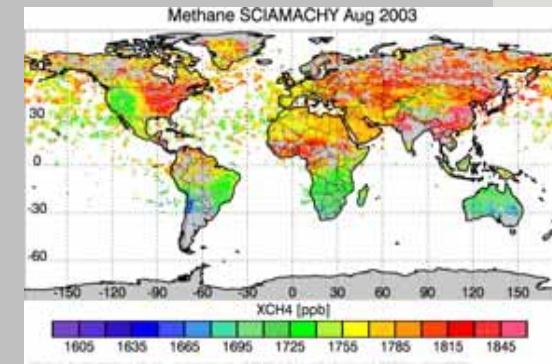
- Air quality
- Climate Forcing, e.g. Aerosols, ECVs
- Ozone
- UV monitoring/Solar radiation



=> Support **implementation** of Directives (Air Quality) & international conventions (Montreal, CLRTAP, Kyoto)

=> Better analysis of national, regional air pollution **abatement policies & measures**

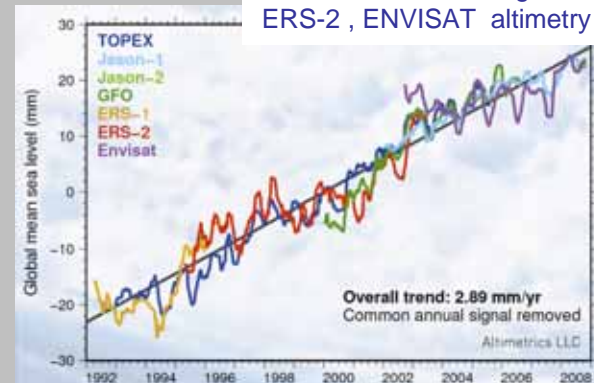
=> **Solar Energies**: Solar-radiation potential analysis





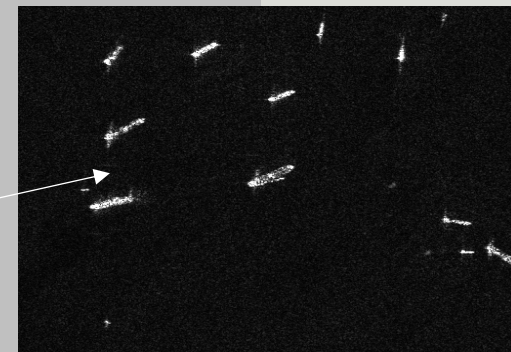
Scope

- Supporting **Climate Science & Scenario making**
- Monitoring & Verification: **Emissions, Land use, Deforestation, Water availability, Greenhouse gases, Polar caps**
 - Sustained and operational monitoring of Essential Climate Variable (ECV) (total of 44 GCOS ECVs)
 - Re-analysis of long-term time series of current and archived data sets
- Supporting & Monitoring **Adaptation Measures and Indicators**



Scope

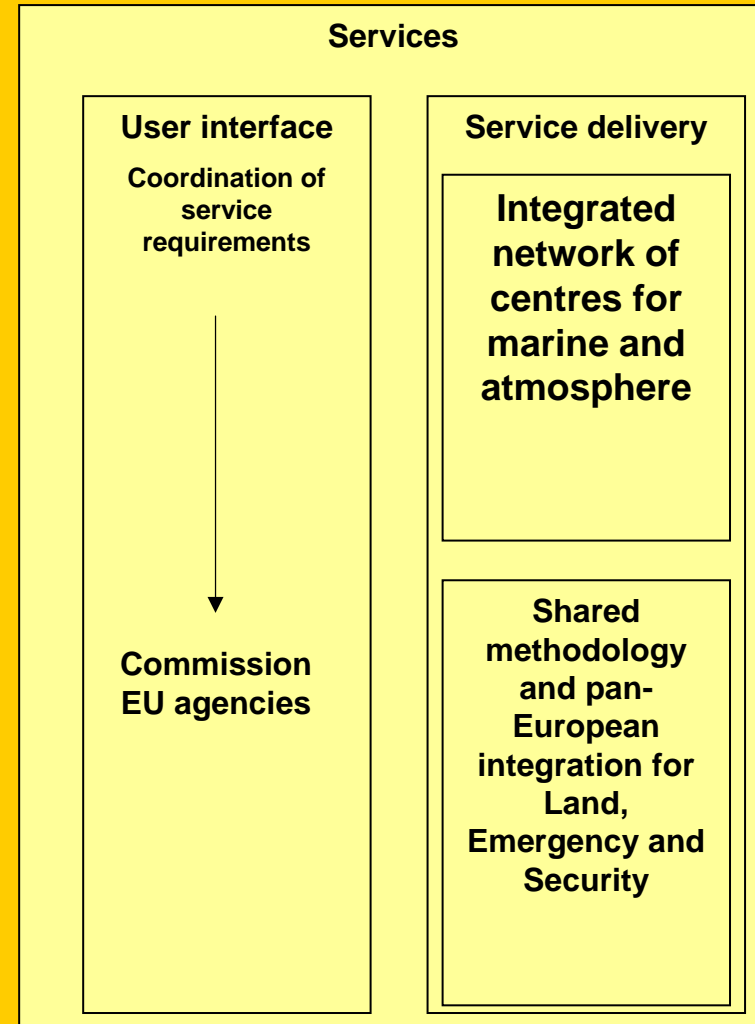
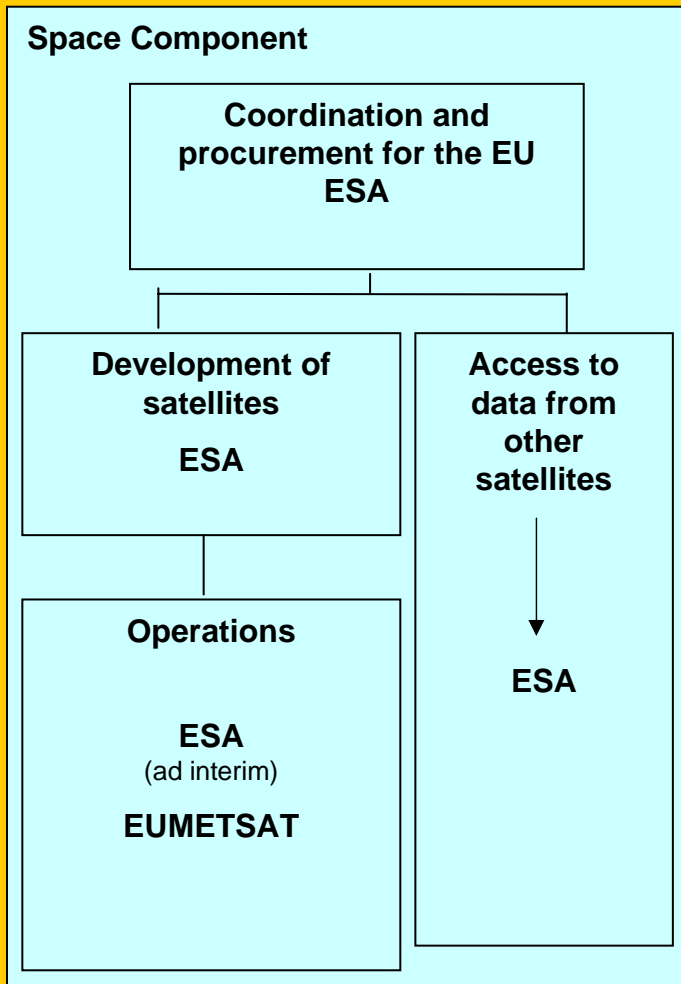
- Thematic areas (user-communities based):
 - Support to EU External Action
 - Border surveillance (land, sea)
 - Maritime Surveillance (ship detection and tracking)
 - Homeland Security [TBC] e.g. Chiefs of Police needs



GMES Initial Operations 2011-2013 (1)


- New bodies set up by the Regulation
 - **GMES Committee (Member States)**
 - **European User Forum**
 - Ad-hoc group advising the Commission
 - Composition laid out in the Regulation
- Partners Board – no formal role under new Regulation (important role during transition period)

Technical Implementation



- **GIO proposed Emergency Service Scope:**
 - ‘Response’ phase: on-demand production of damage assessment and reference maps in rush mode available 24/7
 - Background production of reference maps over risk areas and on-demand production of other products for ‘non response’ phase
 - External QC and validation

GIO proposed Land service Scope:

- Global component : Essential Climate Variables & integration into models
- Pan-EU Land Cover component: 5 high-resolution layers, support to MS inventories harmonization
- Local component: continuity of Urban Atlas and extension to other 'hot spots' (e.g. biodiversity, coastal areas..)
- Access to reference data at Pan-EU and national level
- External QC and validation
-  Scope might be further enlarged (2013+) to thematic component (Agriculture, Water, Forestry etc.)