



GMES Services Benefits for Africa

GMES and Africa
1st Workshop on Marine and Coastal Areas
9-10 October, 2012
Mombasa, Kenya

GMES Bureau



Outline

- GMES – An introduction
- Service applications
- Opportunities for Africa

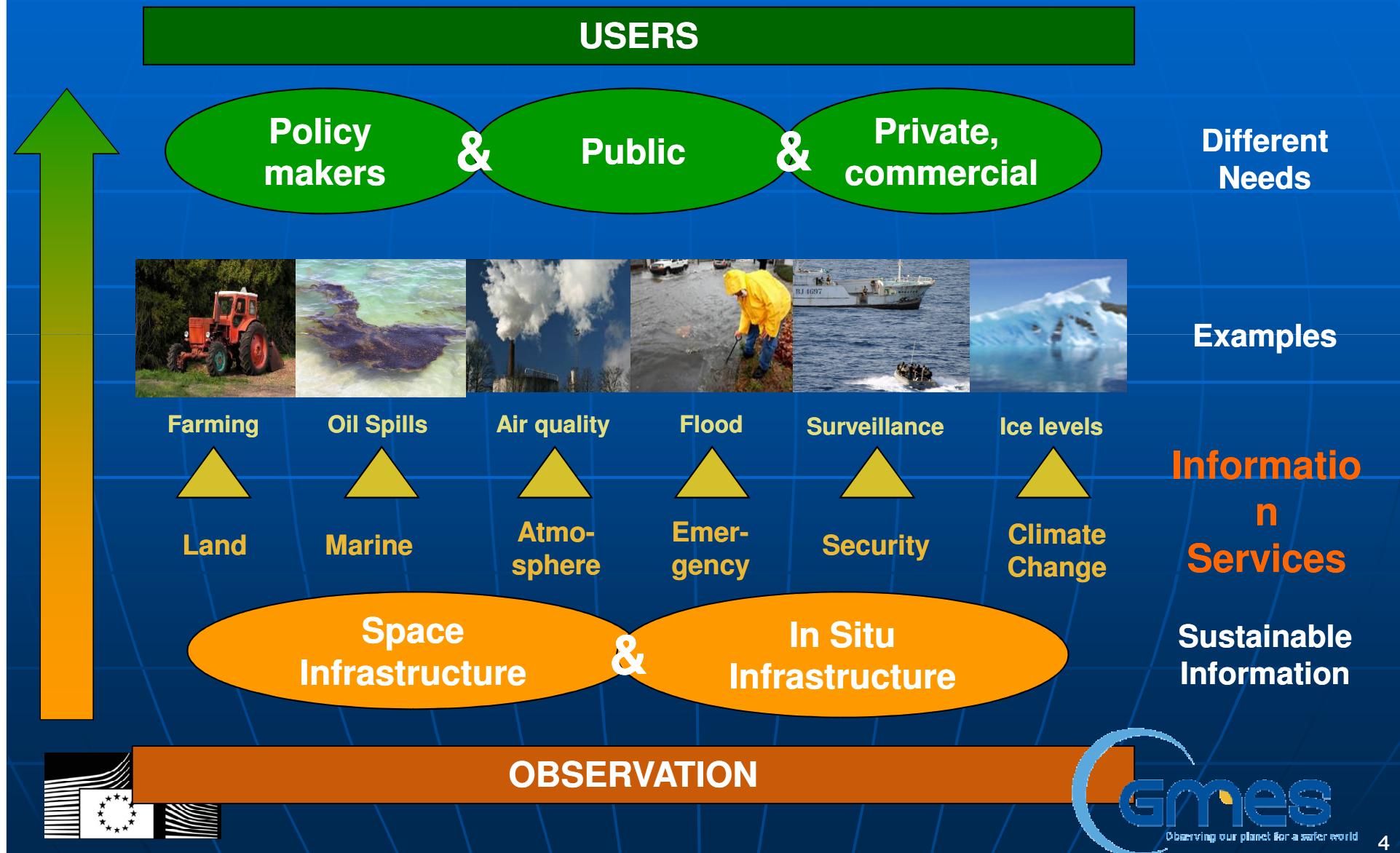


What is GMES?

- An **user driven integrated** Earth Observation system (EO and in-situ data) for environment and security applications with global reach
- A source of information for **policymakers**, scientists, business and the public at large
- **GMES is a joint EU – ESA initiative**

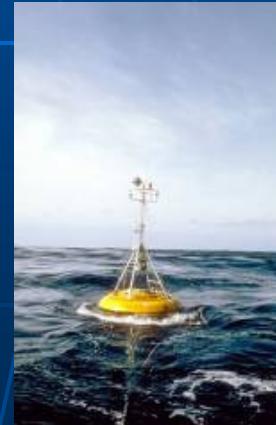
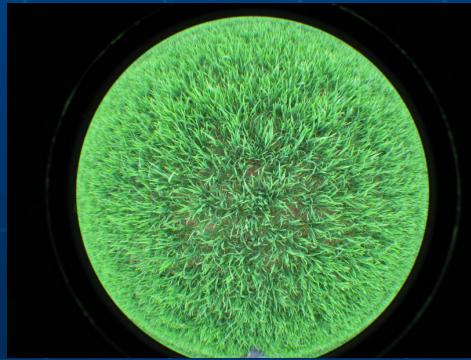


GMES Overall View: from infrastructure to users



GMES In situ component

- Observation mostly within **national responsibilities**, with coordination at European level
- **Air, Sea and Ground based systems and instruments**
- **Led for Europe by the European Environmental Agency (EEA)**

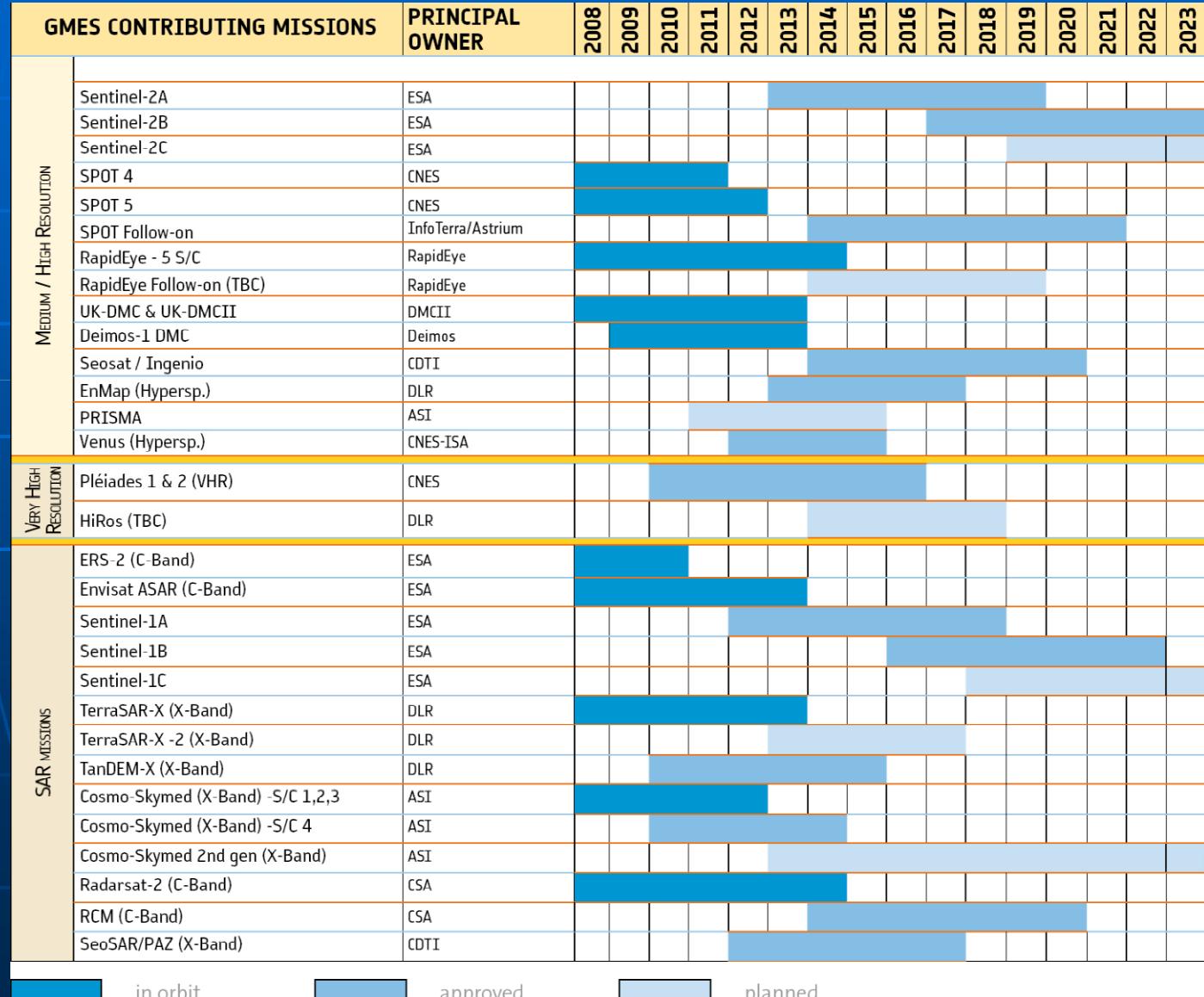


GMES Space Infrastructure

- **SENTINELS** – EO missions developed specifically for GMES
- **Contributing missions** – EO missions built for purposes other than GMES but offering part of their capacity to GMES (EU/ESA MSs, EUMETSAT, Commercial, International)
- **Led for by the European Space Agency (ESA)**



GMES – Space Segment Contributing Missions



Outline

- GMES – an introduction

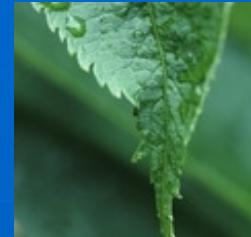
- Service applications

- Land
- Marine
- Atmosphere
- Emergency Response
- Security
- Climate Change

- Opportunities for Africa



I. Land



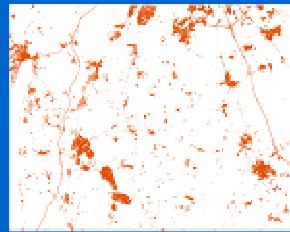
1. **Pan-EU Land Cover**
(5 High Resolution layers of main land-cover classes)

2. **EU Local component**
('hot spot' zooming on areas of interest using VHR images)

3. **Global component**
(Global Terrestrial Variables produced on near real time and on a ten-days basis)



5 HR layers under development (GIS model approach) Example from Alpine test site



Imperviousness



Vegetation
Intensity



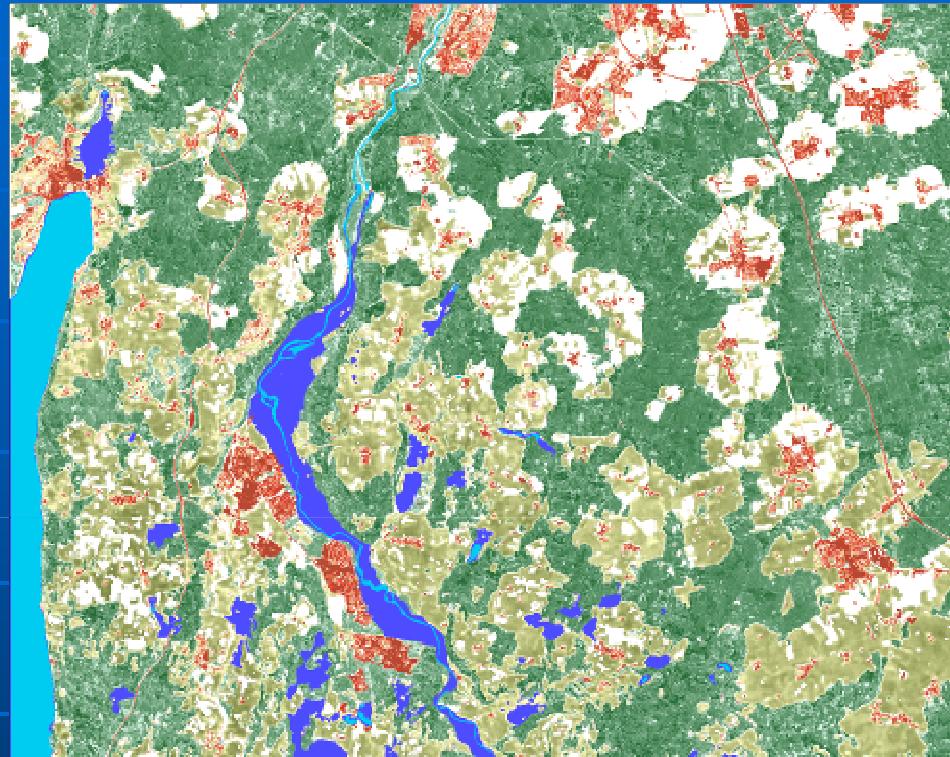
Forest Crown
Cover Density



Wetlands



Water

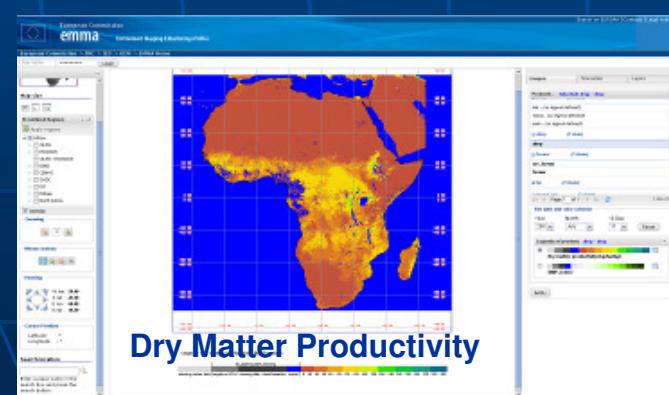
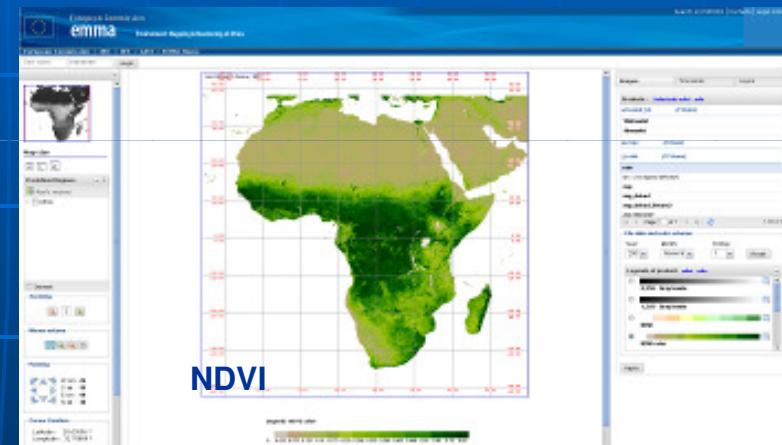
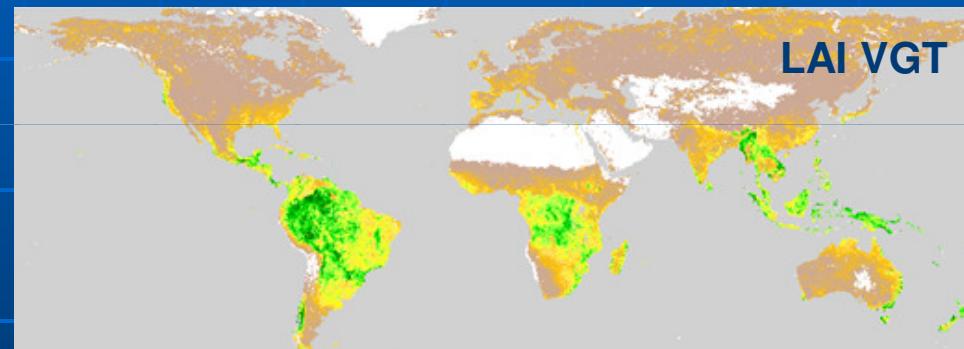


Legend

- Degree of Imperviousness (in %)
- Vegetation Intensity Indicator
- Forest Crown Cover Density (in %)
- Wetlands
- Water
- Other (e.g. Agriculture)

Global component

Product	NRT / Off-line	Spatial Resolution	Spatial coverage	Temporal Resolution	Sensor (back-up)
LAI, fCover, fAPAR, DMP, NDVI, Phenology	NRT	1 km	Global	10-days	VGT (MODIS)
Time series of vegetation products	Off-line	4 km	Global	10-days	AVHRR + VGT
Burnt areas + seasonality	NRT	1 km	Global	Daily	VGT



Global component applications

- **Crop Monitoring and Food Security**



- **Natural Resources monitoring**



- **Water Management and Drought**



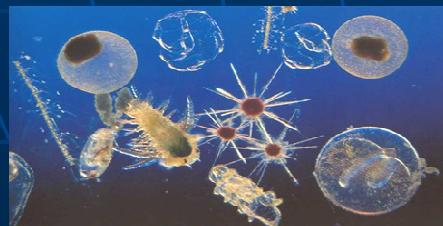
- **Terrestrial Carbon Cycle monitoring**



II. Marine

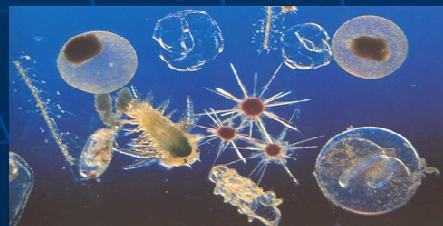


The GMES marine monitoring services provide information on the state of physical ocean and marine ecosystems for the global ocean and the European regional areas.



Four application areas

- maritime safety
- marine environment and coastal regions
- marine resources
- seasonal meteorological forecasting and climate monitoring

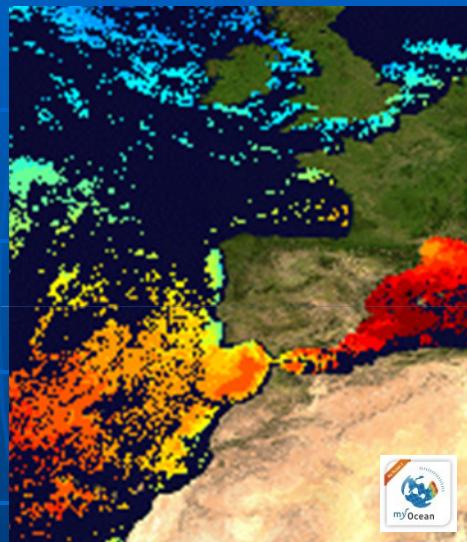


Observations/models provide information about different ocean parameters

- Temperature
- Salinity
- Currents
- Sea ice
- Sea level
- Wind
- Biogeochemistry



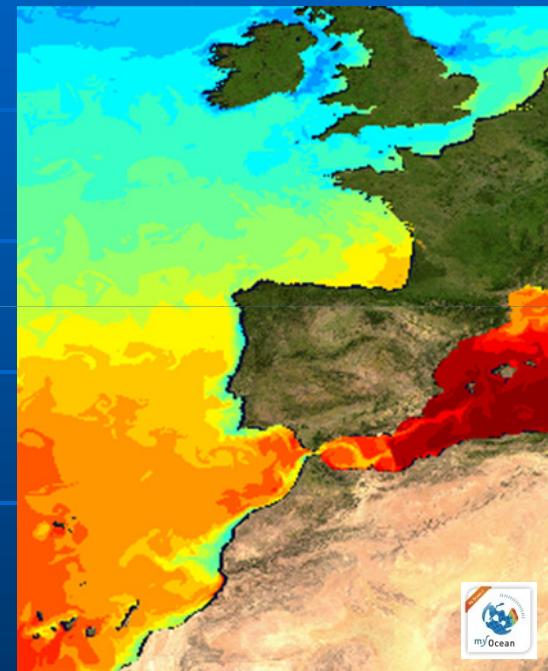
Sea Temperature



SST – satellite
observation



in-situ
measurements



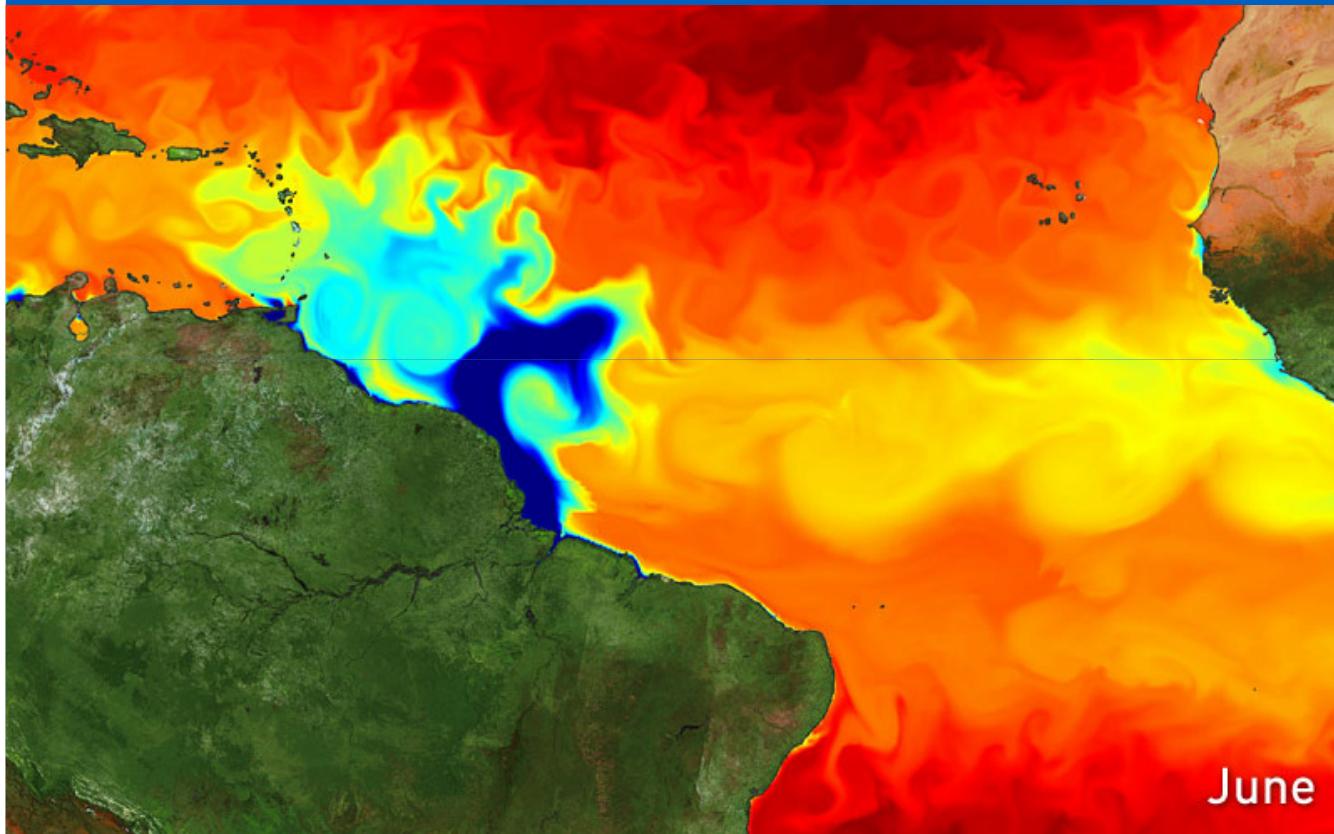
Assimilated model product

Independent observation and measurements

Source my ocean



Sea Surface Salinity

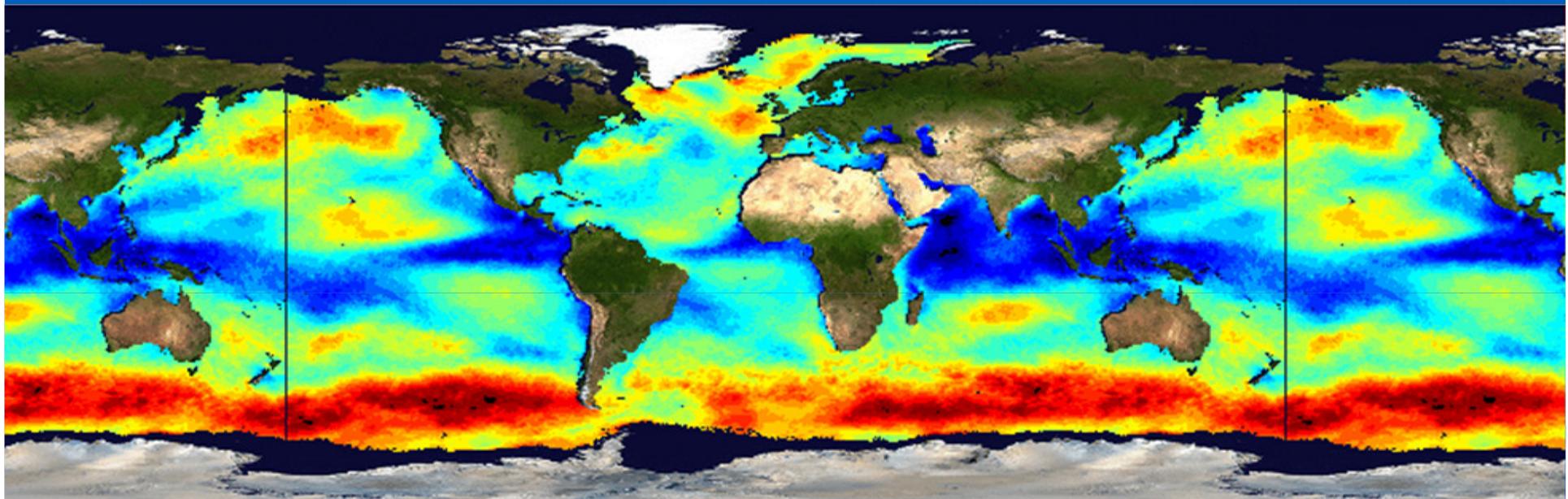


Sea Surface Salinity is a key parameter to estimate the influence of oceans on climate.

Along with temperature, salinity is a key factor that determines the density of ocean water and thus determines the convection and re-emergence of water masses.

The Amazon fresh water plume can be seen hundreds of kilometres from the river mouth.

Surface winds

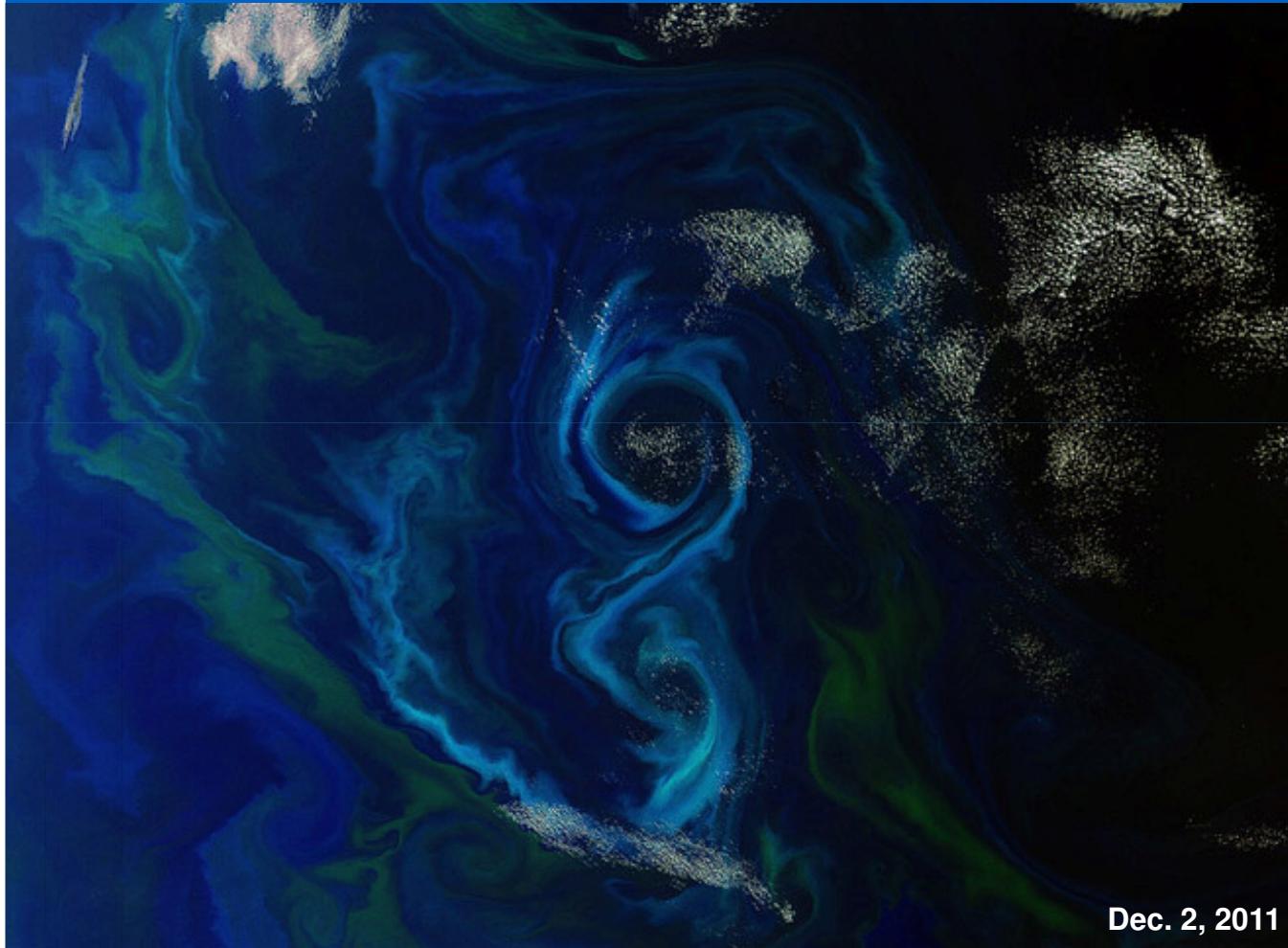


Global wind field, monthly mean, April 2012

Wind speed 10m above sea water



Phytoplankton bloom



Phytoplankton bloom swirls a figure-of-8 in the South Atlantic Ocean about 600 km east of the Falkland Islands.

Once a bloom starts, an ocean colour sensor can make an initial identification of its chlorophyll pigment, and therefore its species and toxicity.



Source: ENVISAT (ESA)

MyOcean Portal

■ <http://www.myocean.eu.org>



The screenshot shows the MyOcean Portal homepage with a blue header and a background image of the ocean. The header features the MyOcean logo and a search bar. The main content area is titled "OCEAN MONITORING AND FORECASTING" and "Providing PRODUCTS and SERVICES for all marine applications." It includes a navigation menu with tabs: "ABOUT US" (highlighted in orange), "MARITIME SAFETY", "MARINE RESOURCES", "COASTAL & MARINE ENVIRONMENT", and "WEATHER, CLIMATE & SF". A central banner promotes "MYOCEAN SCIENCE DAYS 2012" in Germany. The left sidebar has sections for "NEWS & EVENTS" (with a link to a GMES event), "EDUCATION" (with links to observation, modelling, and ocean parameters), "PRESS/EDITION CORNER" (with a link to all corners), and "SCIENTIFIC PUBLICATIONS" (with a link to all corners). The right sidebar has sections for "USER CORNER" (with links to ask the service desk and news flash), "ACCESS THE CATALOGUE" (with a link to go), "PRODUCT IMPROVEMENTS", "TECHNICAL FAQ", "USER NEWSLETTER", "FIRST VISIT?" (with links to discover products & services and register now), and "FOCUS ON" and "PRODUCT SHOWCASE" sections.

OCEAN MONITORING AND FORECASTING
Providing PRODUCTS and SERVICES for all marine applications.

» ABOUT US » MARITIME SAFETY » MARINE RESOURCES » COASTAL & MARINE ENVIRONMENT » WEATHER, CLIMATE & SF

MYOCEAN SCIENCE DAYS 2012
«MyOcean Science Days»
2nd Edition
19-21 November 2012, Germany

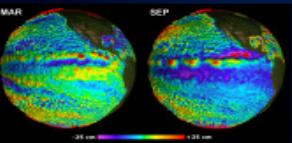
More on : <http://www.myocean.eu/web/16-news-events.php?item=602>

EDUCATION
Come and discover how MyOcean monitors and forecasts oceans.
» Observation
» Modelling
» Ocean parameters

PRESS/EDITION CORNER
» all corners

SCIENTIFIC PUBLICATIONS
» all corners

FOCUS ON
UPDATE ON SATELLITE DATA SUPPLY TO MyOcean2
 Space-based observation systems and data are essential for GMES in general and for MyOcean services in particular. What about the recent EnviSat end of mission? What impacts on MyOcean services and products for users?
» Learn more

PRODUCT SHOWCASE
La Niña, the terrible Sister
 Following its elder brother (El Niño) from mid-2010, La Niña has in turn wreaked havoc on Pacific coasts (and more). Catastrophic flooding in Australia, in particular, occurred in December 2010-January 2011. A new La Niña episode is ongoing, even if less intensive than last year one. It is expected to continue up till March-April-May 2012.
» Learn more

Search... » OK

USER CORNER
» ASK THE SERVICE DESK
» NEWS FLASH!

ACCESS THE CATALOGUE
» GO

» PRODUCT IMPROVEMENTS
» TECHNICAL FAQ
» USER NEWSLETTER

FIRST VISIT?
» DISCOVER MYOCEAN PRODUCTS & SERVICES
» REGISTER NOW!

FP7 Research Activities - Marine

Downstream GMES services

FIELD_AC
Operational service for coastal areas

SIDARUS
Sea Ice downstream services

OPERR
CSA

ASIMUTH
Forecast harmful algal bloom

CoBiOS
Predict high biomass blooms in coastal waters

SeaU
Satellite based oil spill detection

R&D to enhance GMES applications in the Marine area

OSS2015
Biogeochemical products

OPEC
Biogeochemical & ecological parameters

MyWAVE
Ocean surface waves modelling

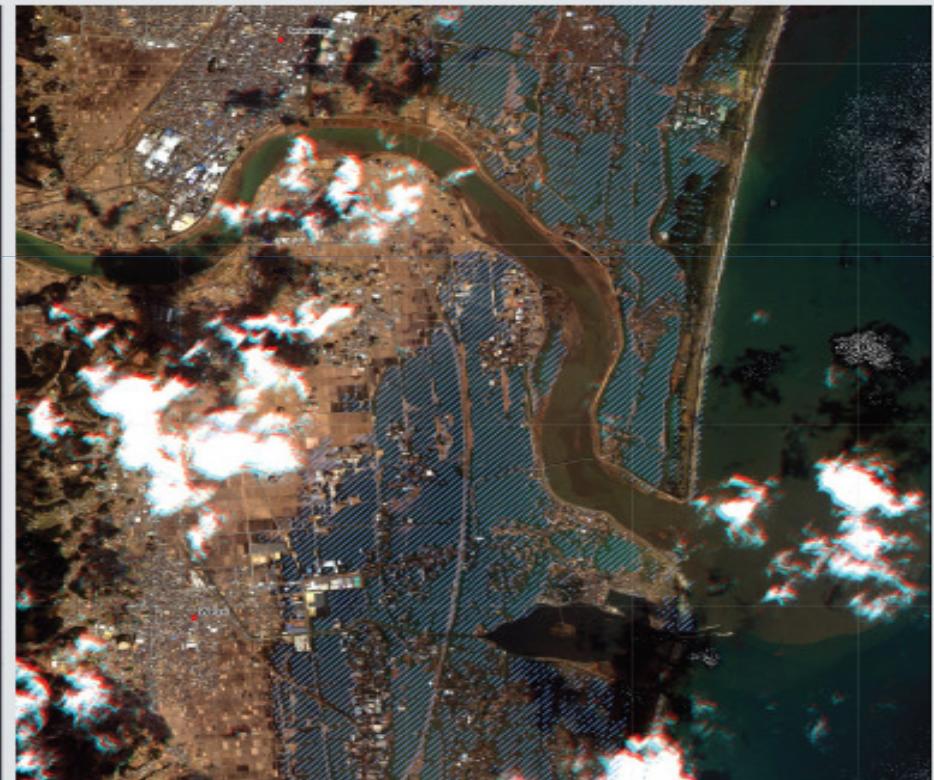
SANGOMA
New data assimilation techniques

MyOcean 2
Core service



IV. Emergency Response

e.g. Coastal areas : Japan Tsunami



Services Implementation

(R&D-FP7)

		Land	Marine	Atmospher e	Emergency	Security	Cl. Change
FP7 Projects	Core	GEOLAND2	MYOCEAN* MYOCEAN2	MACC* MACCII	SAFER*	GMOSAIC*	
	Service Evolution / R&D	BIO_SOS MS.MONINA ISAC MYWATER SIRIUS GLOWASIS IMAGINES** LOTUS** GLASS** SenSyF**	MYWAVE OPEC OSS2015 SANGOMA	NORS	LAMPRE** IncREO** SENSUM** PREFER**	G- SEXTANT** G-NEXT** SAGRES** LOBOS** NEREIDIS DOLPHIN SIMITYS	EURO4M MONARCH-A CARBONES ReCOVER REDDAF
	Downstream applications	CRYOLAND FRESHMON EUFODOS WatPlan MALAREO	FIELD AC AQUAMAR ASIMUT COBIOS SeaU SIDARUS OPERR EAMNET	PASODOBLE ENDORSE	EV OSS DORIS SubCOAST PANGEO GeoPICTURE * GARNET-E		
	Inter. Coop						REDDINESS REDD-Flame
GIO	Operational Services	Pan EU Land Global Land			EMS- Mapping EFAS		



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Access to Data and Products

- GMES is an **operational program**; main users are operational entities (public and private) and the **Science community**
- GMES is a **public good**. Overriding goal is to provide **full and open access to data and products** (security restrictions may apply)



Africa-EU Cooperation on EO

- **GMES can support African users**
 - **African institutions can provide input to the definition of the scope of GMES Services in particular through the GMES and Africa action plan**
 - **GMES Data Policy makes satellite data and GMES Service products available to African partners**
 - **Cooperation exists today through several R&D funded projects**



International Cooperation

- GMES and GMES and Africa partners should ensure a coordinated approach for an international cooperation strategy, building on coherent cooperation schemes
 - GMES and Africa initiative (Africa-EU)
 - Group on Earth Observations (Multilateral)



Thank you

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<http://ec.europa.eu/enterprise/policies/space/gmes/>

http://ec.europa.eu/enterprise/policies/space/research/fp7-projects/index_en.htm

