



GEOLAND Overview of Interacting parts and future plans



Marc Leroy

Jean-Christophe Calvet

Marek Tinz

Kees van Diepen

Etienne Bartholomé





- A- Land Cover Change in Europe
- B- Environmental Stress in Europe
- C- Global Vegetation Monitoring

Policies/ Directives / Conventions

Habitats
ESDP, ESPON
Natura 2000
Wetland Directive
Water Framework
Directive
Soil Thematic Strategy
Sustainable Developm.
Fight against Poverty
Global Change
Kyoto
Global Environment
Protection



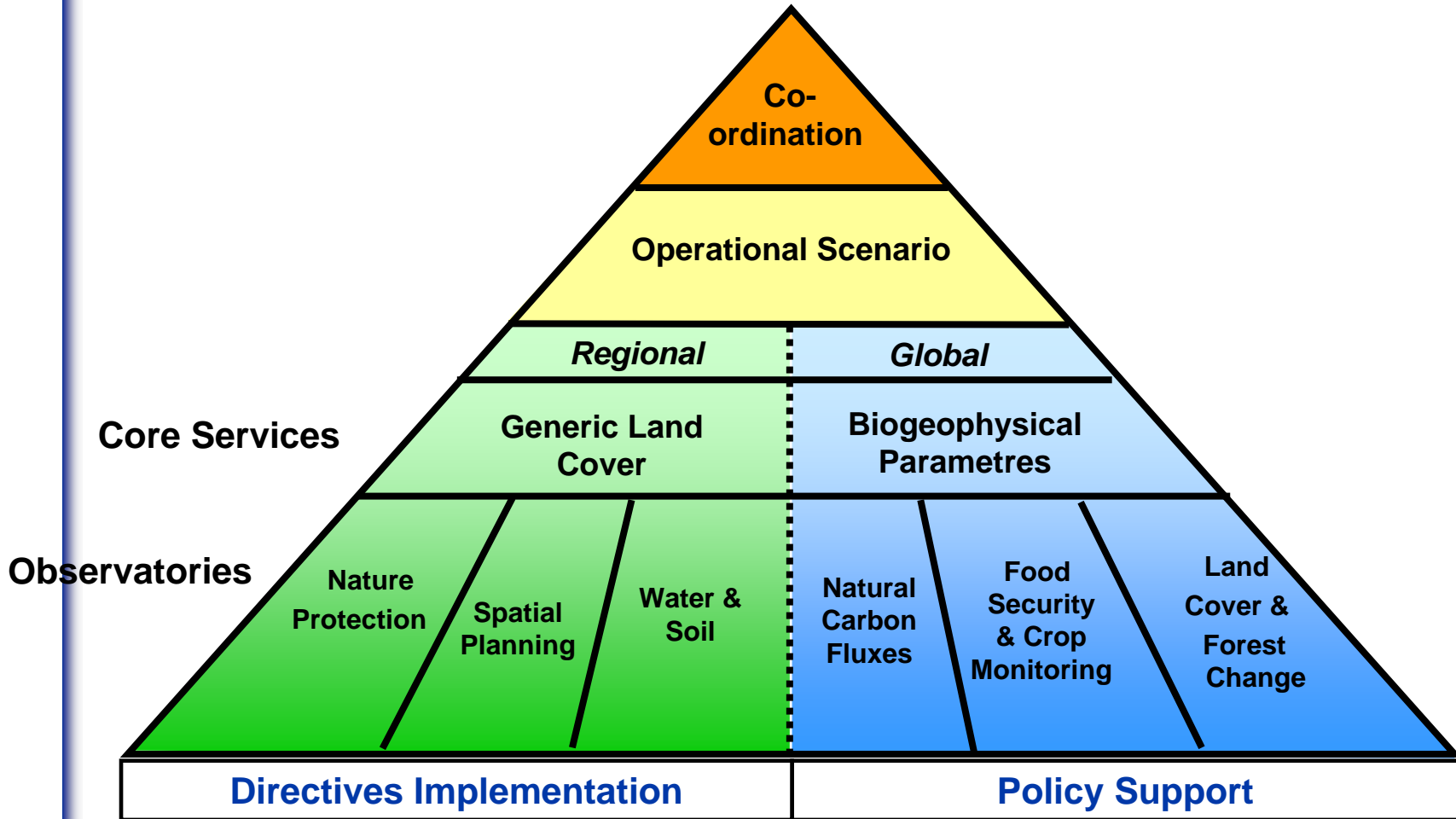
Service Portfolio

Services

- upstream exploitation of synergies

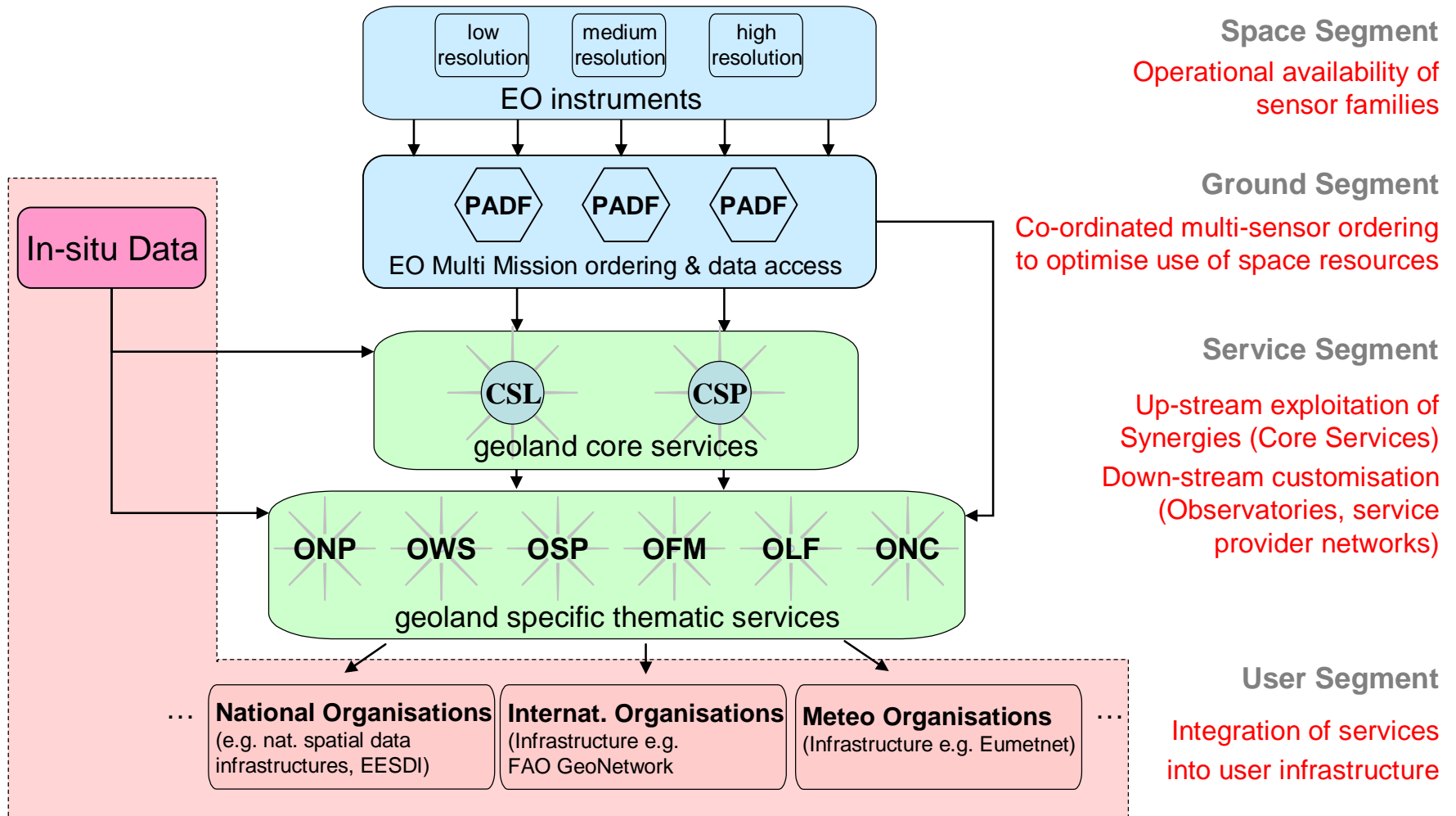
Observatories

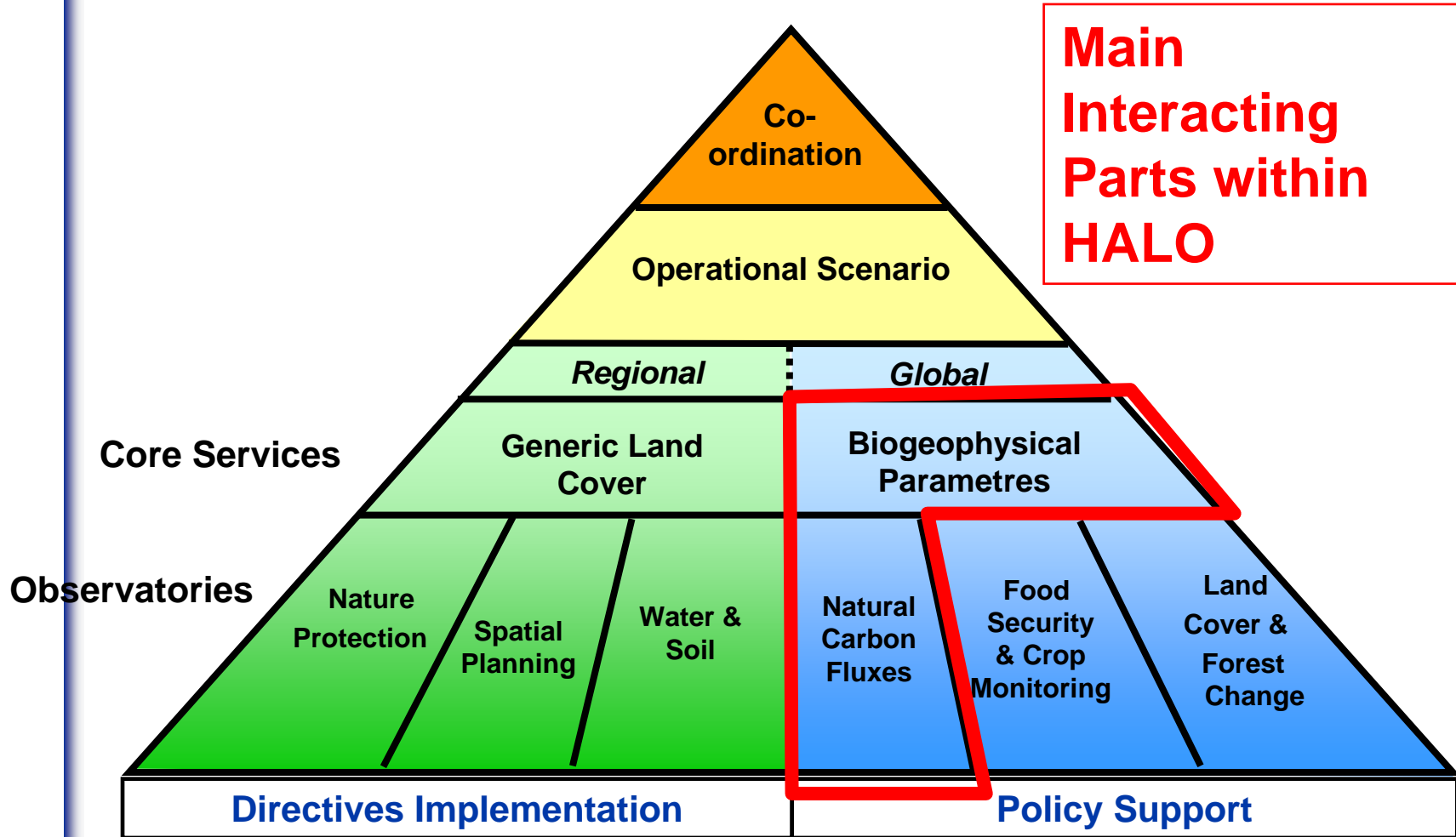
- downstream customization





geoland System Layout







Data flow	Source	Destination	Delivery Mode	Theme/Product
Meteorological forcing fields for land surface models	ECMWF	Geoland-ONC	Regular	Air temperature/humidity, wind speed, precipitation, incoming radiation (short and longwave)
Geoland Global products	Geoland-CSP	GEMS	Regular + On-demand	Generic Land Cover (300 m – 1 km resolution)
Geoland CSP-OLF vegetation CO2	GEOLAND-CSP-OLF	GEMS @ ECMWF	to be checked, initially research mode only	Land use change and forest fires
geoland ONC vegetation CO2	GEOLAND-ONC @ ECMWF	GEMS @ ECMWF	to be checked, initially research mode only	Vegetation data as input for emission models (biogenic and fires): CO2 fluxes, above-ground biomass, stomatal conductance
GEMS global aerosol products	ECMWF	geoland retrieval centres	to be checked, initially research mode only	Atmospheric Aerosol data for atmospheric corrections in retrieval
Geoland Global Gobal products	Geoland-ONC @ECMWF	GEMS @ ECMWF	Regular + On-demand To be checked, initially research mode only (TBC)	Biogeophysical Parameters (Rainfall for water cycle, burned area, active fire and LAI for trace gas emission) Vegetation data as input for emission models (biogenic and fires) (TBC)
Satellite forcing fields for land surface models	Geoland-CSP	Geoland-ONC	Regular	Improved precipitation fields and incoming radiation (short and longwave)



Land Surface Monitoring

Regional /
Europe

Global

surface- atmosphere
surface

- Land Surface Monitoring has two components :
 - global
 - regional over Europe
- The Regional part is starting (Fast-Track Service)
- The Global part should also start
 - technical & scientific maturity sufficient
 - two thematic areas
 - *surface-atmosphere interactions* (→ “meteorology”)
 - *land surface properties per se* (→ “environment”)
 - “unifying factors”
 - *similar space products in input*
 - *public funding*



The future of GEOLAND is a GMES Global Land Monitoring Service, consisting of

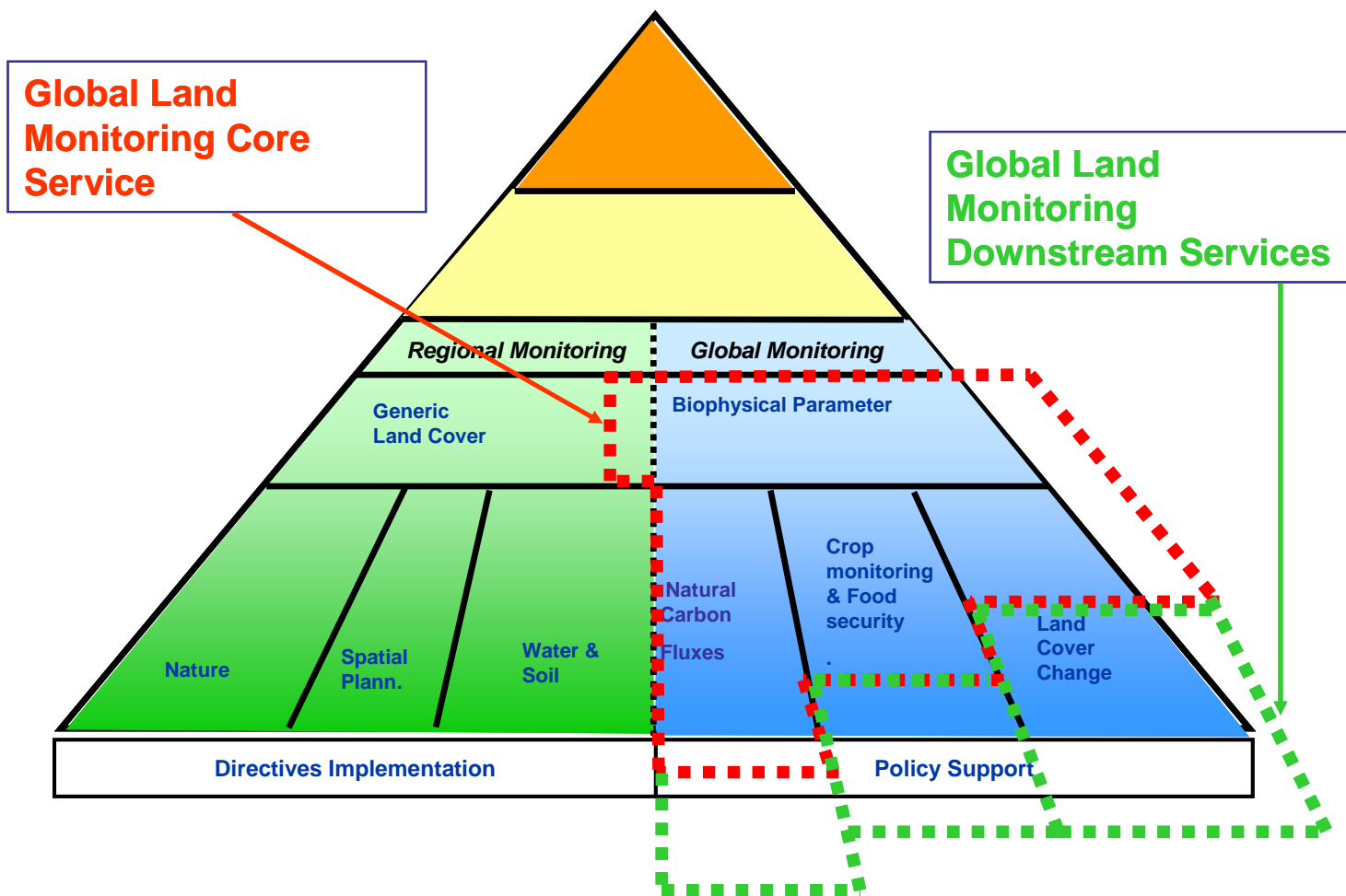
- a single Core Service
 - standardized products
 - large geographical coverage

- a series of Downstream Services
 - customized products
 - tightly connected to the Core Service, from which they receive generic information

Global Land Monitoring GMES Service perimeter



geoland





Core Service Products



Category	Theme	Sub theme	Product
EO-based, low level			Surface reflectance, Backscattering coefficient, Brightness temperature
EO-based	Biogeophysical parameters	Vegetation	LAI, fAPAR, fCover, phenology, burnt areas, active fires, land cover, vegetation indices
		Radiation	Albedo, downwelling flux, surf. temperature
		Water	Water bodies, soil moisture, water level
Data assimilation in process models	Natural Carbon Fluxes		Carbon flux, water flux, carbon storage, LAI, biomass, soil moisture



Downstream Services



theme	downstream service	operator	user segment	status
land cover change	African observatory for sustainable development / environment	JRC	DG DEV, AIDCO, ENV, RELEX	mandate for development
	Boreal Eurasia observatory	TBD	DG ENV, TRADE, Min. Forestry Russia	TBD
	national & regional env. Monit system in Africa	national multi-disciplinary network	National ministries (planning, environemnt, forest,...)	operational mandate exists
	UNEP/DEWA	UNEP/ DEWA	UNEP reporting process	operational mandate exists
crop monitoring	MARS-STAT (Europe)	JRC	DG AGRI	operational mandate exists
	MARS-FOOD component in African observatory for sustainable development	JRC	DG DEV, AIDCO, RELEX, ECHO, FAO, WPP, nat govts, NGOs	mandate for development
	MARS-FOOD (global)	JRC	DG DEV, AIDCO, RELEX, ECHO, FAO, WPP, nat govts, NGOs	operational mandate exists
	national food early warning systems	i.a. national EWS teams, agromet service, etc	National ministries (agriculture, ...)	operational mandate exists
natural carbon fluxes	Atmosphere and Climate	ECMWF	DG Env, National env. Agency	operational mandate exist
	Kyoto protocol reporting team	EEA	DG Env, National env. Agency	operational mandate exist
	agriculture survey	National agromet services	National ministries, DG Agri	operational mandate exists
	Initial conditions for hydrological modelling	National flood forecast services	national water agencies, watershed agencies, civil protection	operational mandate exists



For EO-based products,

- The SAF model is well adapted to the issue of biogeophysical parameter provision
 - *formal link between R&D and services*
 - *mandate over the long term*
 - *centralized management, helps overall efficiency*
 - *flexible funding scheme*
- The existing service providers for remote sensing products should join their forces to face the increasing needs in GMES
 - *extension in product types and levels and geographic coverage*
 - *coverage of various satellite programmes*
- MoU under construction between IM, VITO, and Medias-France/POSTEL



For **data assimilation in models**,

ECMWF and NMS seem the most natural candidates for coordinating this activity

- Global scale (25-50 km resolution): ECMWF has the capability to operate it
- Europe (5-10 km resolution): National Meteorological Services (NMS) could cooperate in the framework of Eumetnet



Downstream services

Several downstream services are at a sufficient maturity level to start rapidly

- The existing MARS-STAT and MARS-Food service at JRC
- « African Observatory for Sustainable Development » at JRC
- Atmosphere & Climate Service to be run at ECMWF as a follow-up of GEMS

Possible onset of downstream services at NMS (improvement of weather forecast models + agrometeorological applications).



Implementation Plan

Implementation of an operational « Global Land Monitoring » GMES Service by 2008 is possible and should be the target

Technically, the Core Service products and the network of Service Providers in Europe are at a sufficient maturity level to start an operational production of limited scope (« Pilot Service ») in 2008

At institutional level, the MoU initiated between biophysical parameter service providers in Europe should be extended to other actors, including ECMWF, NMS and JRC.

To this end, a specific meeting will be held in Brussels on Feb. 16-17 2006.

Improvements of the product portfolio (R&D actions) and operationality can be envisioned during the FP7 period 2008-2013



Operational service starts in 2008

- » limited product portfolio
- » differed time
- » downstream services based on MARS-Food, MARS-STAT, Africa Observatory, ECMWF / Atmosphere & Climate

R&D actions 2008 – 2013

- » funding FP7 Action 6 Environment
- » product portfolio improvement

Service improvement 2008 – 2013

- » funding FP7 Action 9.2 Space, + national
- » deploy large network of downstream services
- » operational carbon service at fine resolution over Europe
- » improve timeliness, delivery frequency, interoperability between service components



Integrated GMES Project on Landcover and Vegetation

Thank you for your attention!

Contact:

www.gmes-geoland.info

Marc Leroy

05 61 27 42 43

marc.leroy@medias.cnes.fr



geoland coordinators:

infoterra
an EADS Astrium company
Infoterra GmbH

 **MEDIAS**
Medias-France



Co-funded by the European Commission within the GMES initiative in FP-6