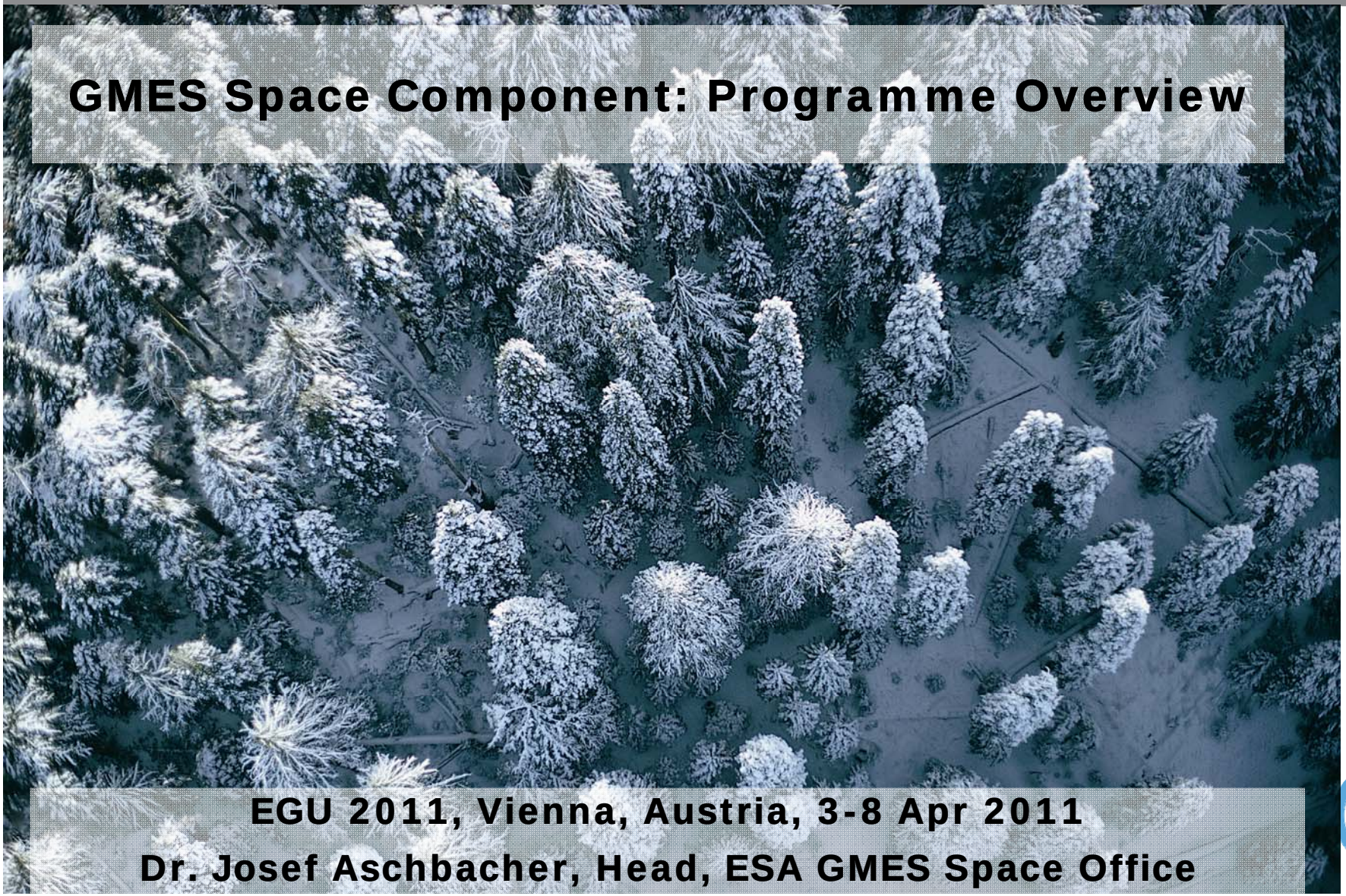
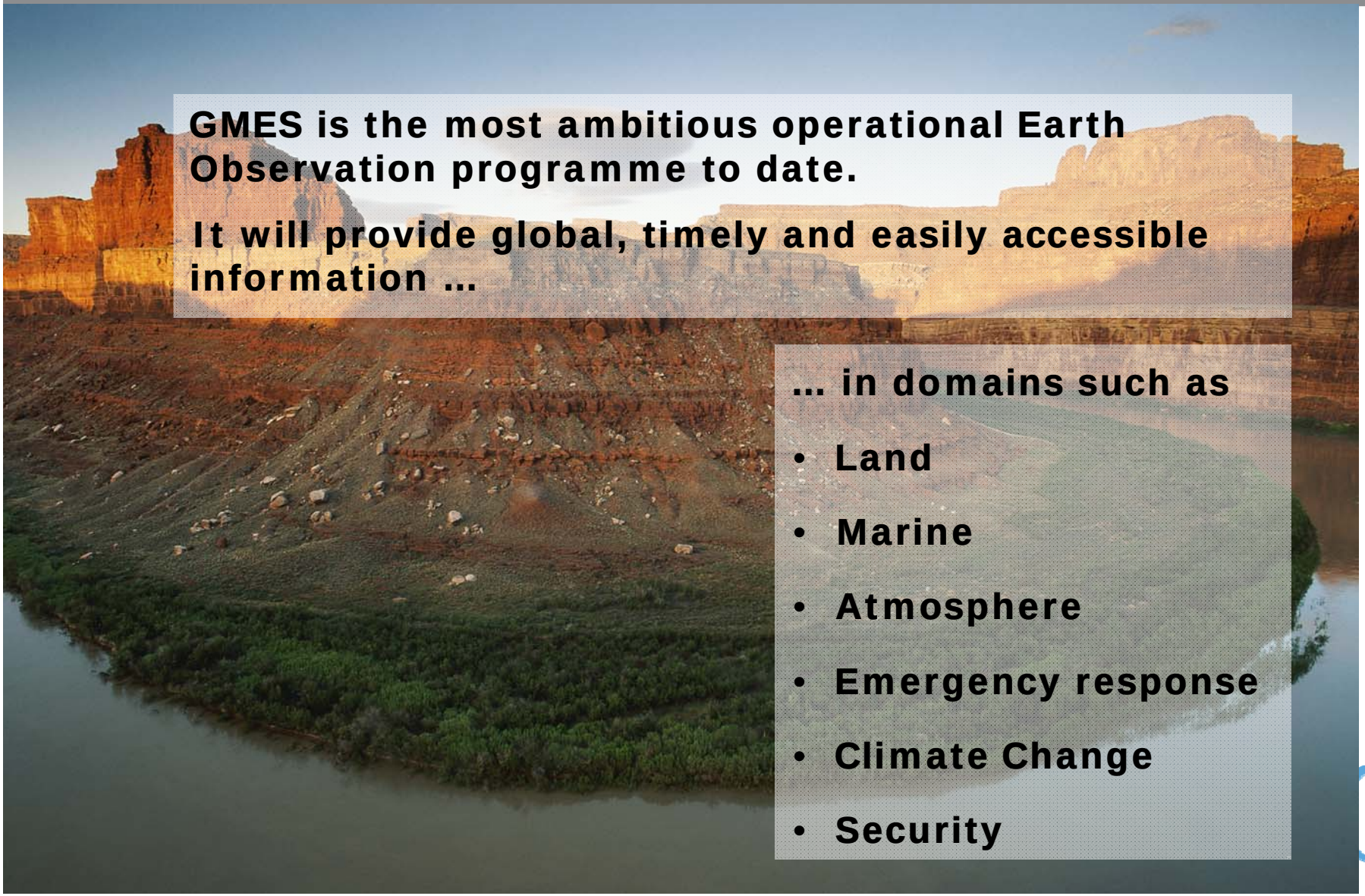
GMES Space Component: Programme Overview



EGU 2011, Vienna, Austria, 3-8 Apr 2011

Dr. Josef Aschbacher, Head, ESA GMES Space Office

GMES: We care for a safer world



GMES is the most ambitious operational Earth Observation programme to date.

It will provide global, timely and easily accessible information …

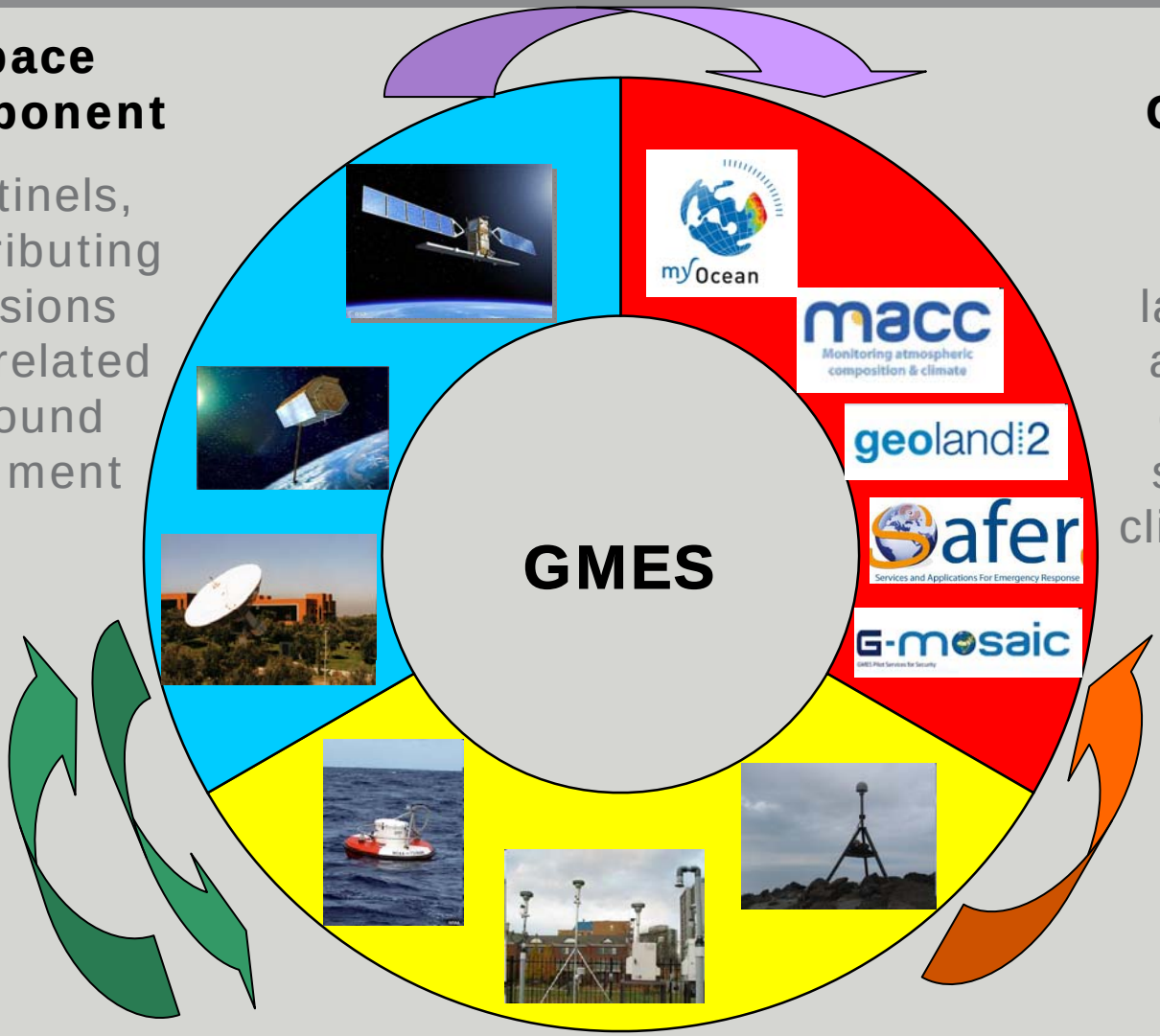
… in domains such as

- **Land**
- **Marine**
- **Atmosphere**
- **Emergency response**
- **Climate Change**
- **Security**

GMES Components

Space Component

Sentinels, Contributing Missions and related Ground Segment

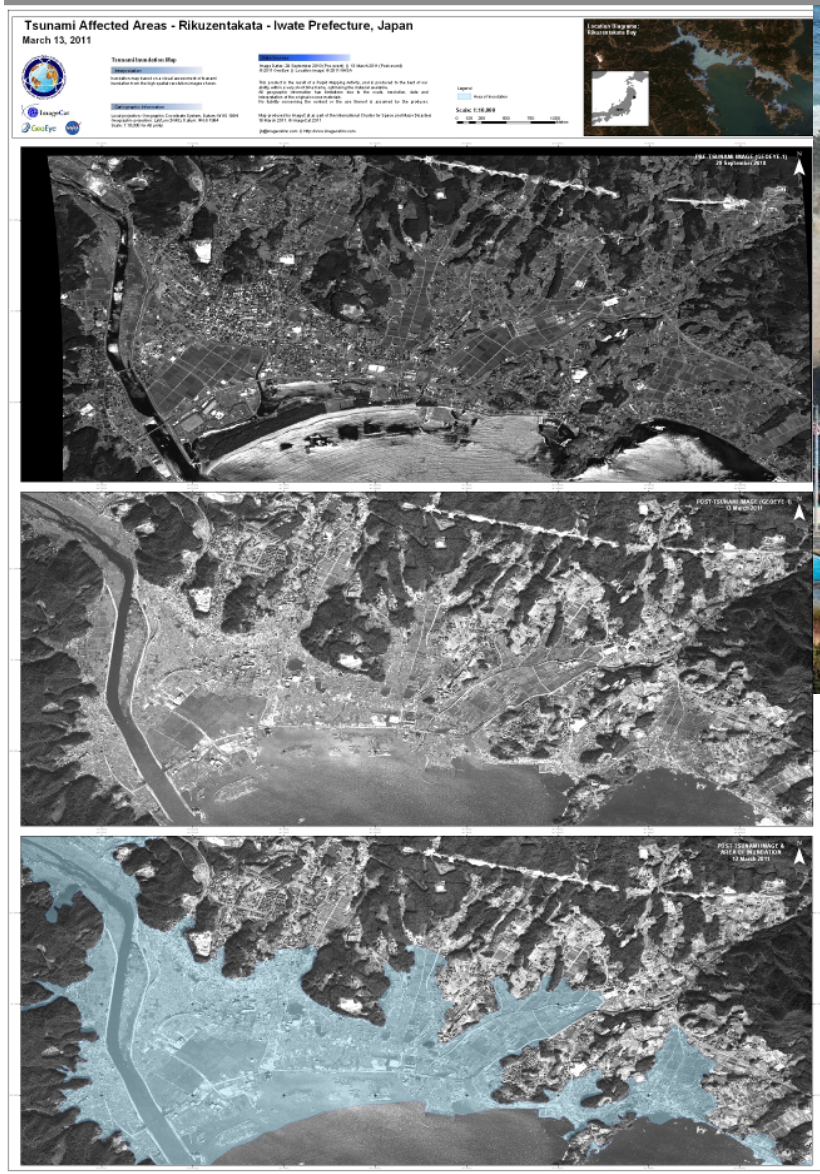


Services Component

Information services for land, marine, atmosphere, emergency, security and climate change

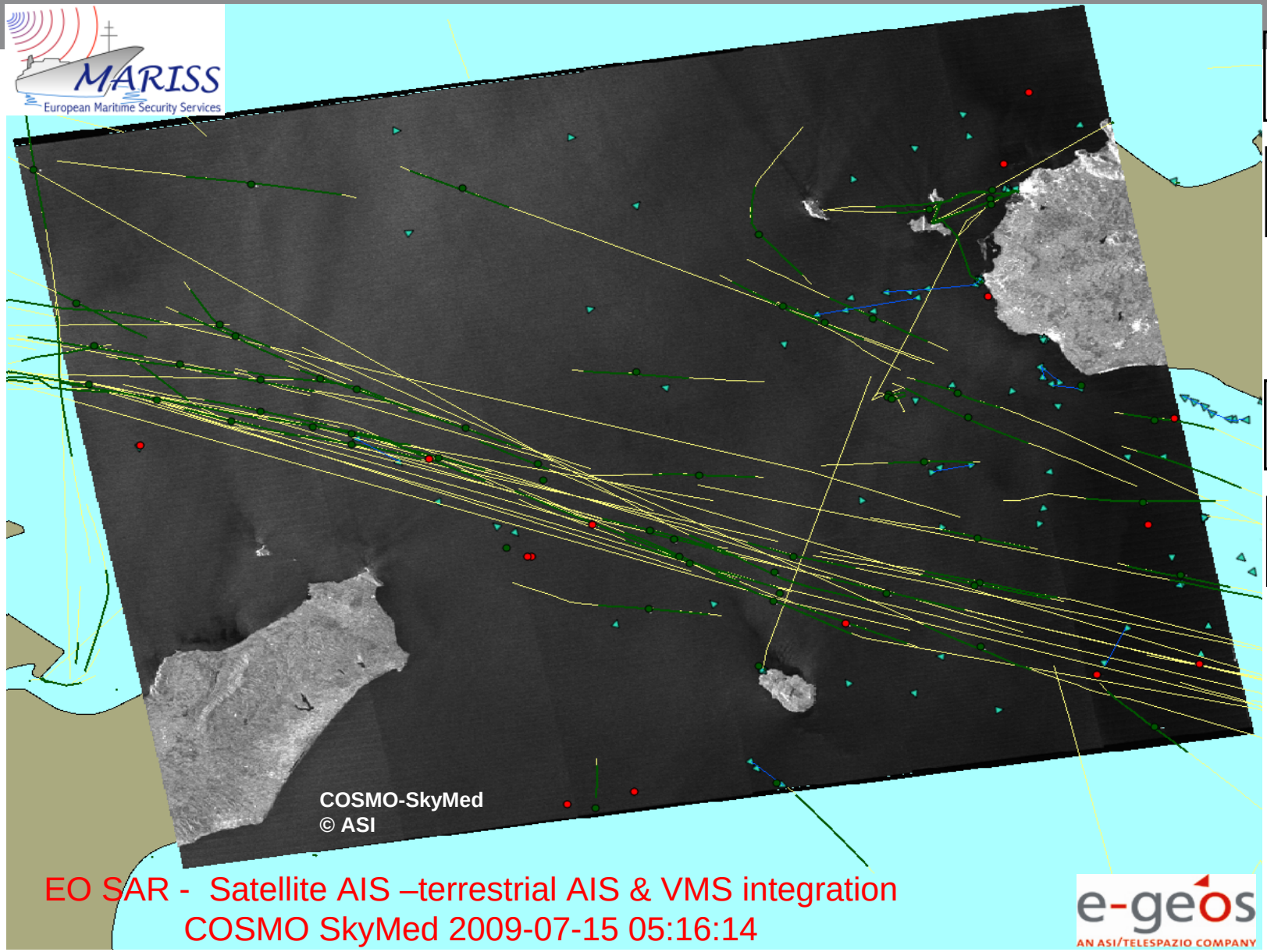
In-situ Component Land, air and water monitoring sensors

Japan Earthquake - Tsunami - Nuclear Disaster
Inundated area 13 March 2011



More than 4000 satellite images acquired of disaster area (as of 29 March)

Example of tactical information support to Italian Coast Guard



SAR Image L1B
2009-07-15 05:16:14

Ship Detection Report

Terrestrial AIS

Satellite AIS

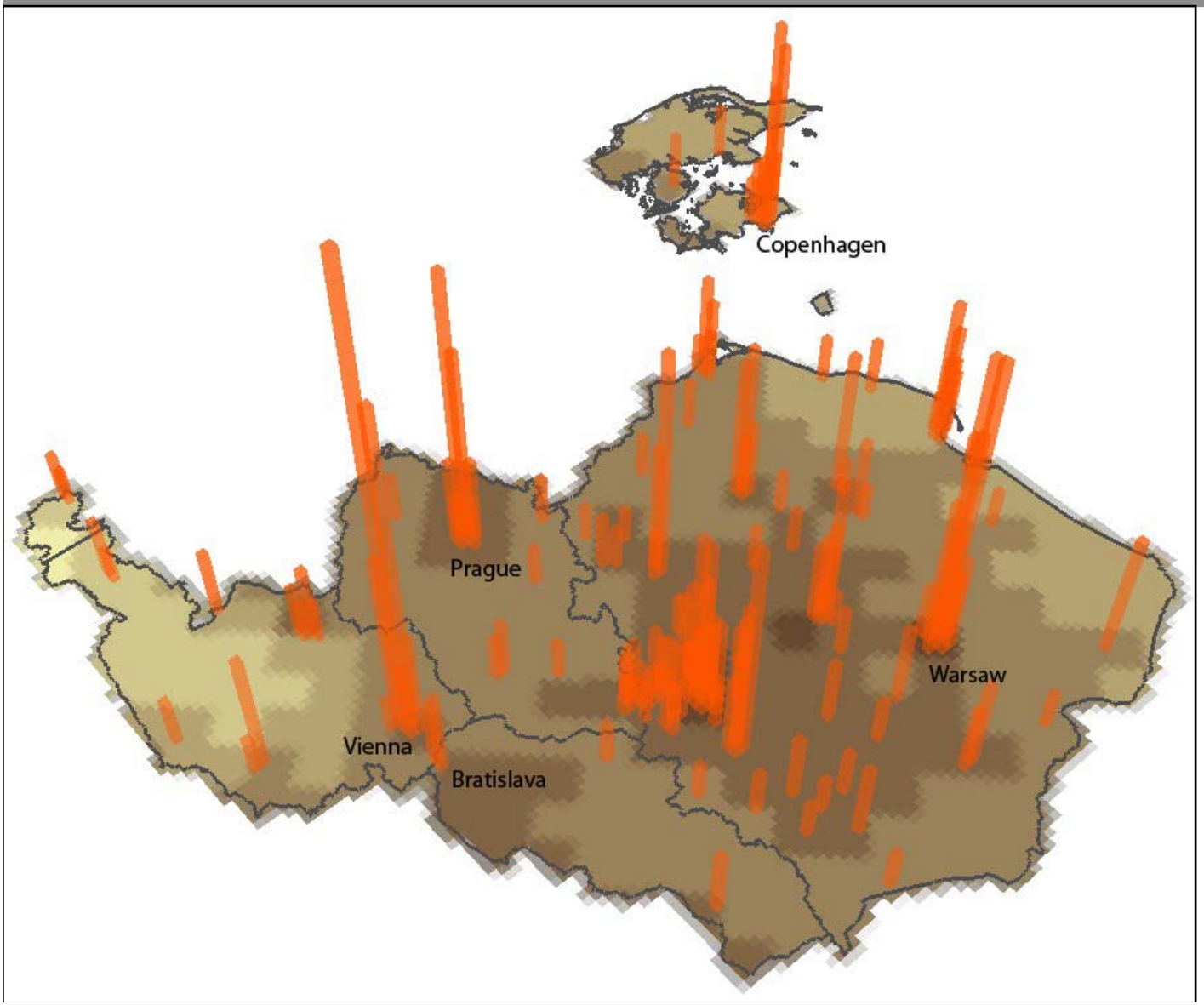
VMS

Not Correlated Ships

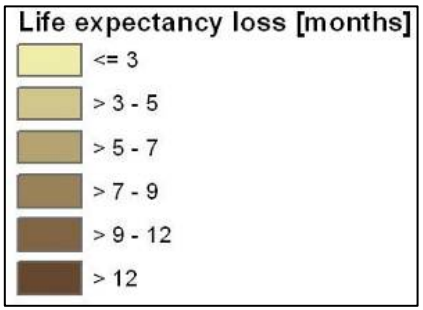
EO SAR - Satellite AIS –terrestrial AIS & VMS integration
COSMO SkyMed 2009-07-15 05:16:14

GMES
We care for a safer world

Example of Atmospheric monitoring service



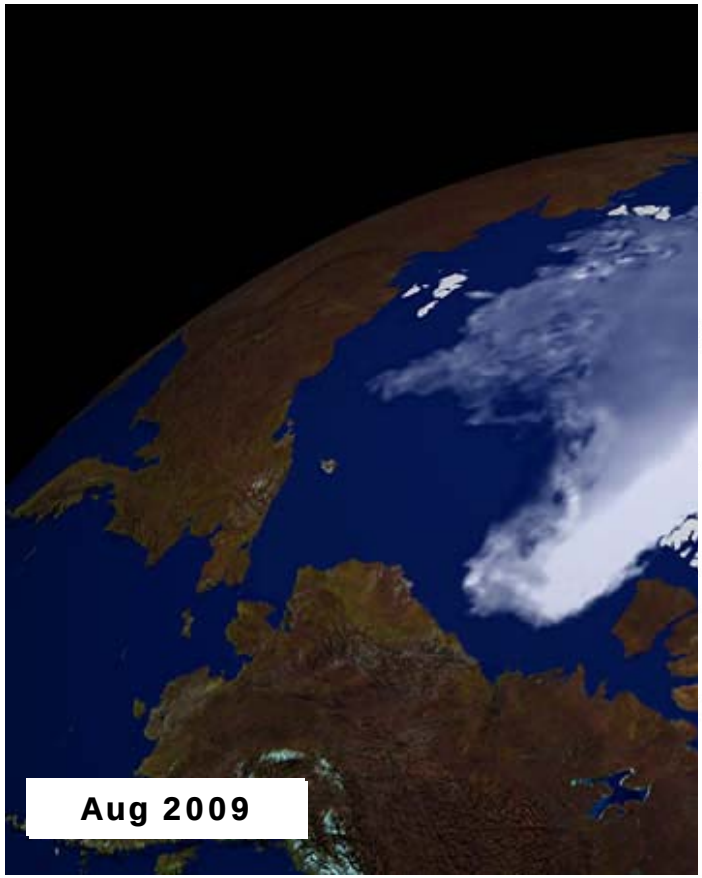
Population 2006 exposed to loss in statistical life expectancy due to $PM_{2.5}$ emissions

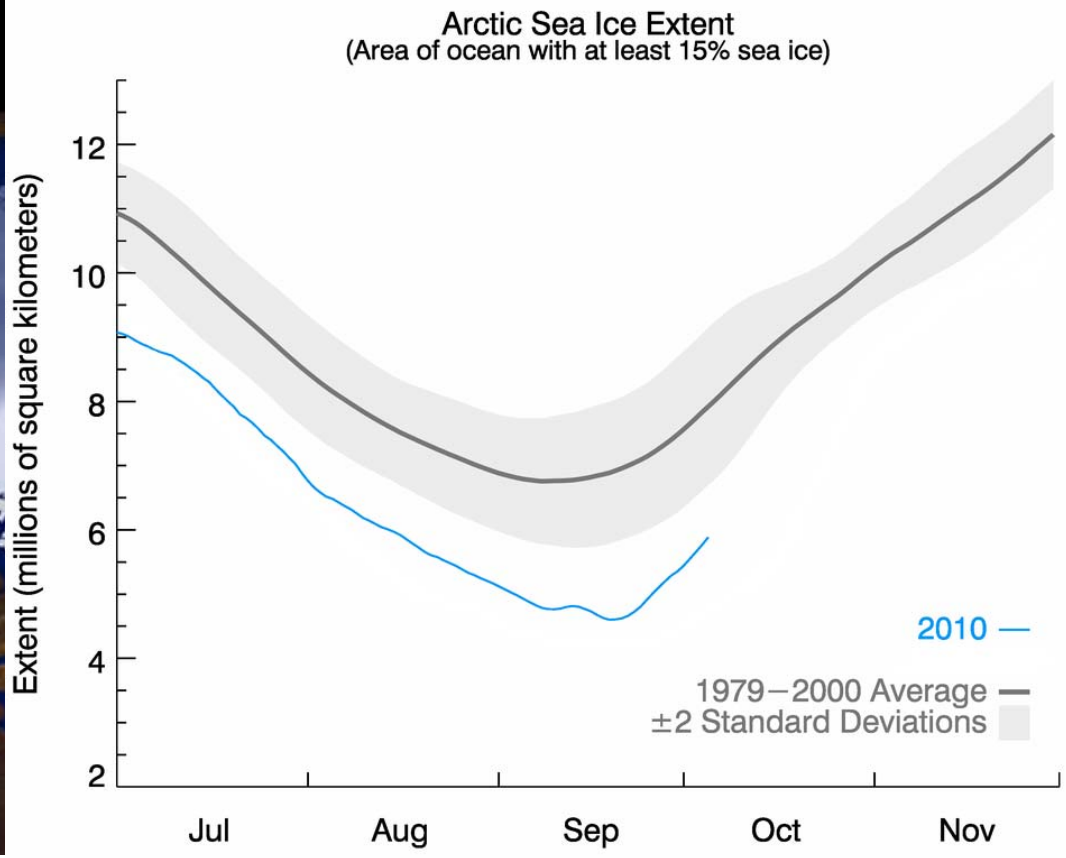


Map examples with 10km resolution (original resolution: 500m)

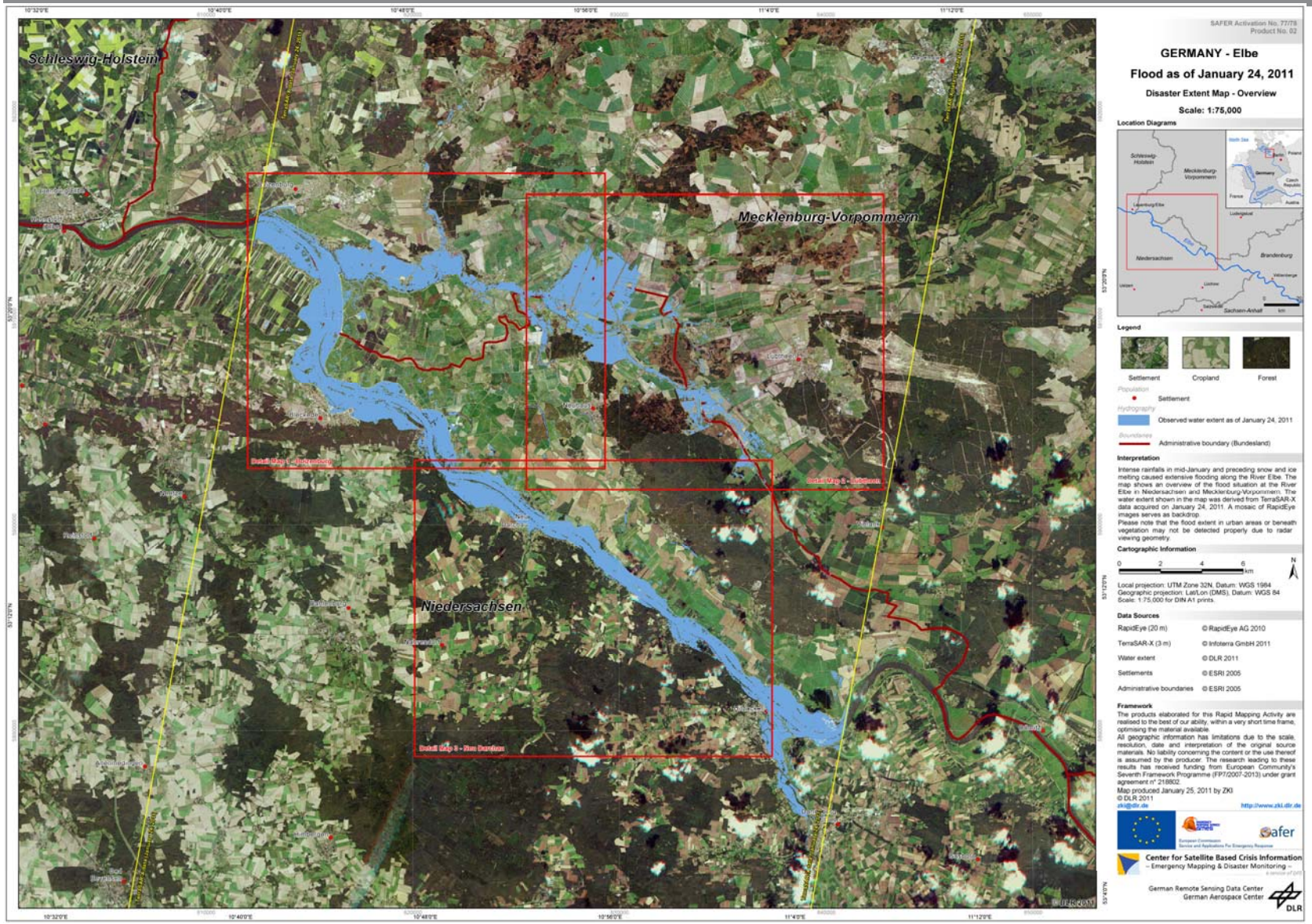
Credits: Geoville GmbHData processing: IIASA modelling – GSE PROMOTE

Example of Climate Change monitoring service





Example of Emergency management response service

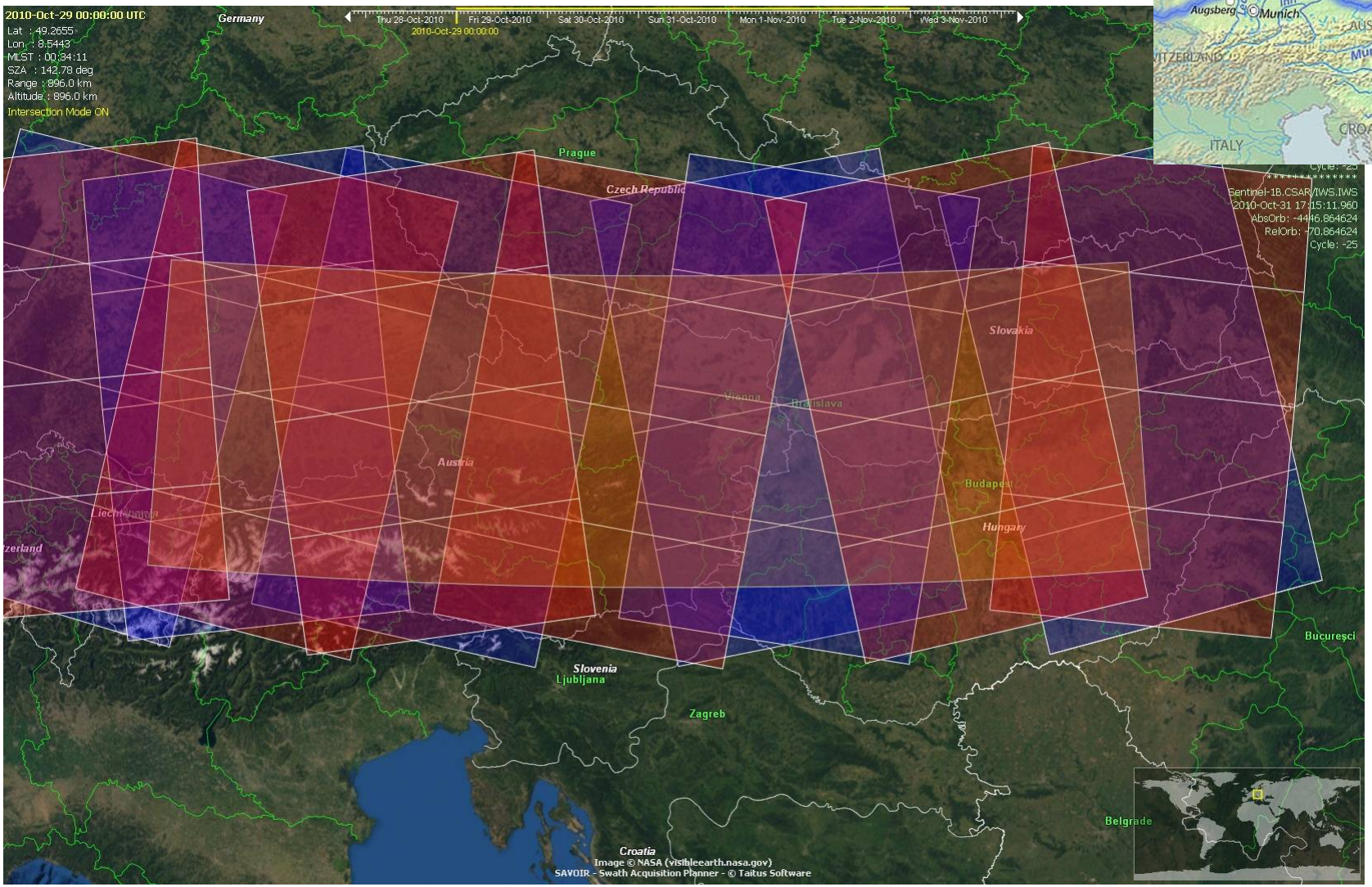


Flooding management of the Elbe river in Germany – 24 January 2011

Data: TerraSAR-X, RapidEye

Credits: DLR/SAFER

Envisat / Sentinel-1 Coverage of an area prone to flooding: Danube River Basin (within 5 days period)



Until 2013: ENVISAT

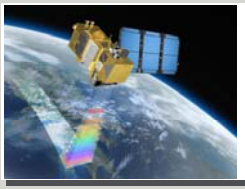
2013: ENVISAT & Sentinel 1A

2015+: Sentinel 1A+B

GMES dedicated missions: Sentinels

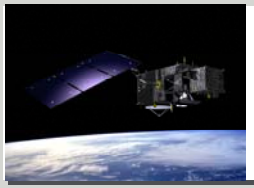
Sentinel 1 – SAR imaging
All weather, day/night applications, interferometry

2013 / 2015



Sentinel 2 – Multi-spectral imaging
Land applications: urban, forest, agriculture,..
Continuity of Landsat, SPOT

2013 / 2016

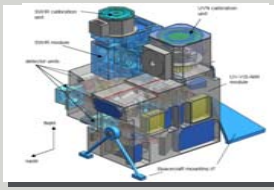


Sentinel 3 – Ocean and global land monitoring
Wide-swath ocean color, vegetation, sea/land surface temperature, altimetry

2013 / 2017

Sentinel 4 – Geostationary atmospheric
Atmospheric composition monitoring, trans-boundary pollution

2019



Sentinel 5 – Low-orbit atmospheric
Atmospheric composition monitoring
(S5 Precursor launch in 2014)

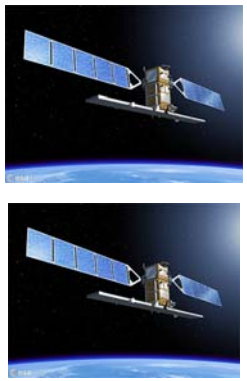
2020+

Earth surface coverage
Sentinel-1 compared to EnviSat ASAR

2

Sentinel-1 (A+B)

IWS mode with
250 km swath
and 5*20 m res



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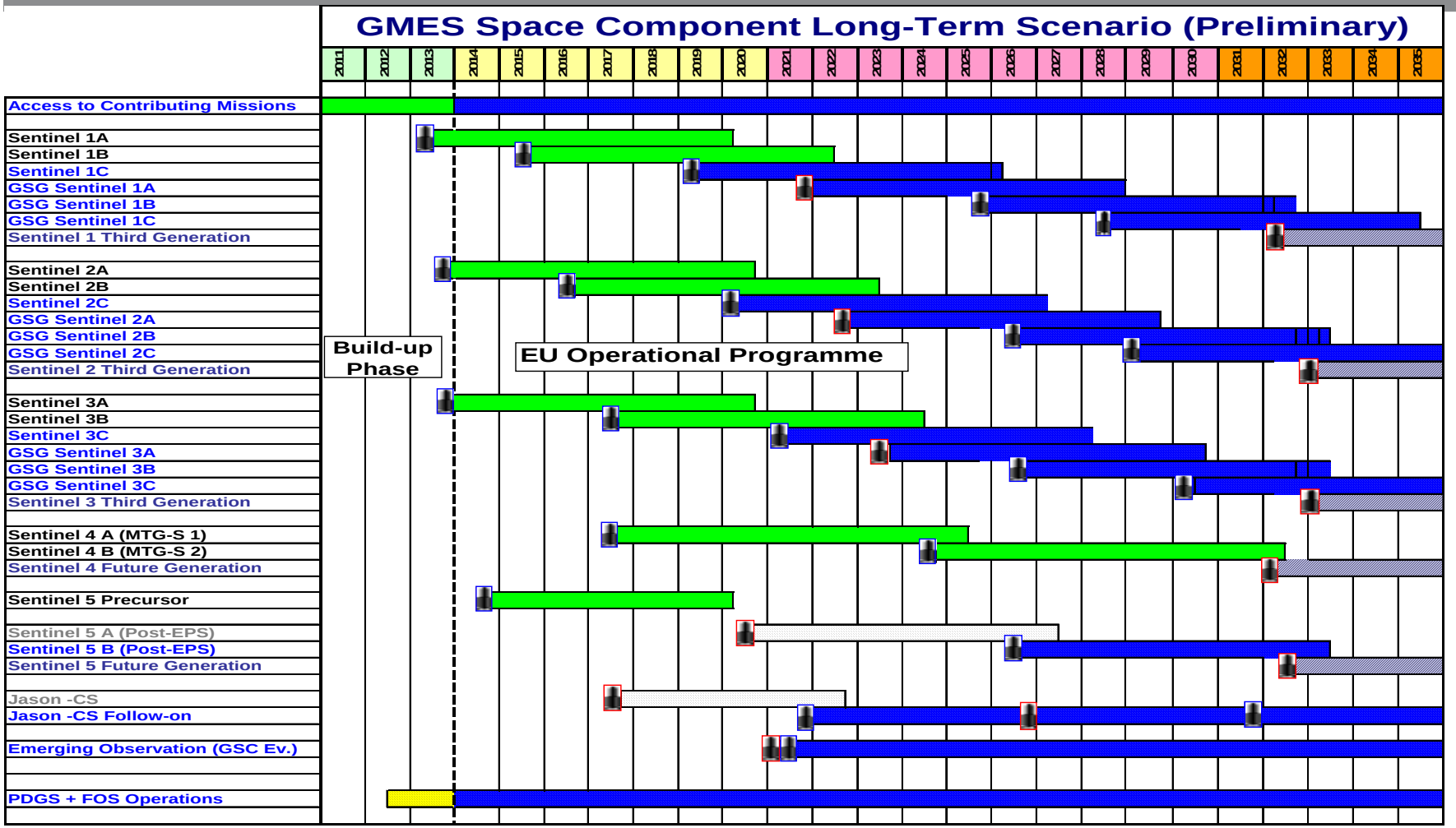
9

Envisat ASAR

StripMap mode with
100 km swath
and 30*30 m res

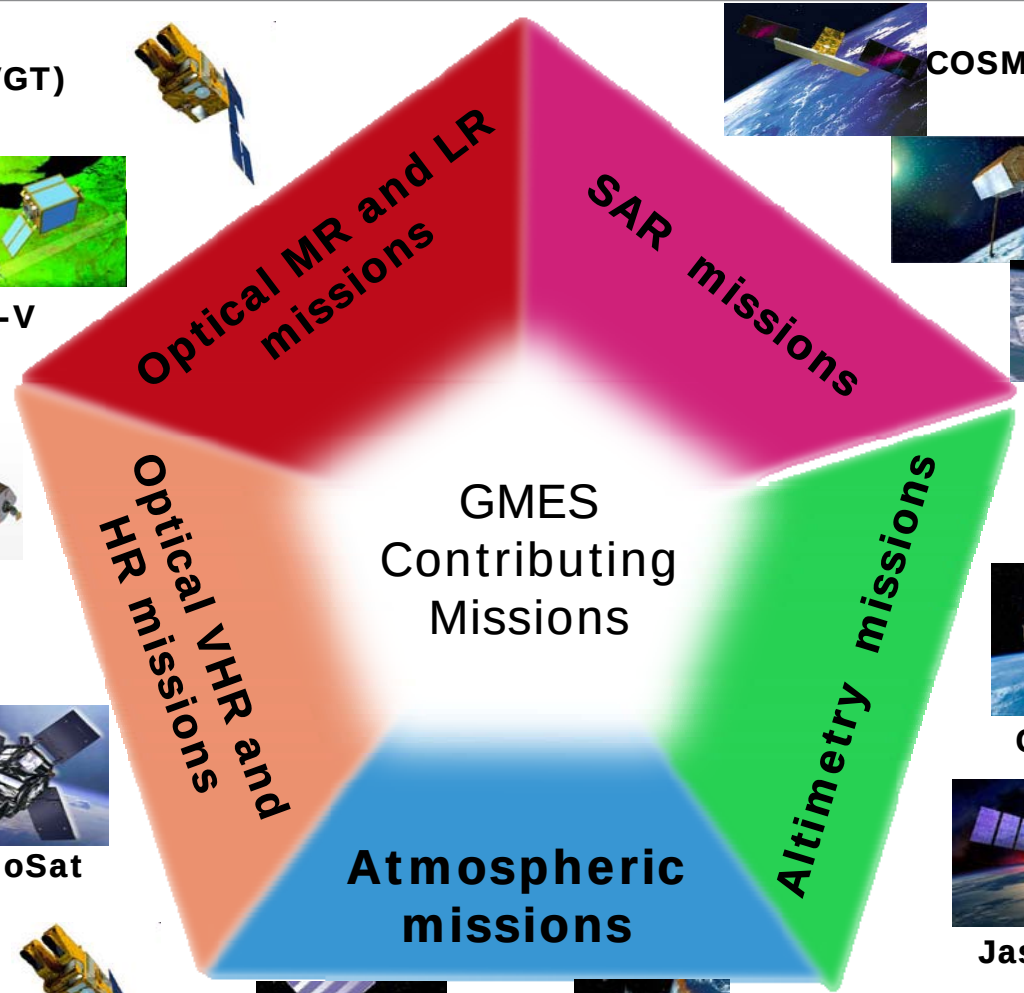
GMES Space Component Long Term Scenario (Launch dates are indicative)



GSC build-up

2.3 bn Euro already provided by ESA MSs and EC

Contributing Missions to GMES – Some examples



SPOT (VGT)

PROBA-V

DMC

Pléiades

SeoSat

RapidEye

SPOT (HRS)

METOP

MSG

COSMO-Skymed

TerraSAR–X
Tandem-X

Radarsat

Cryosat

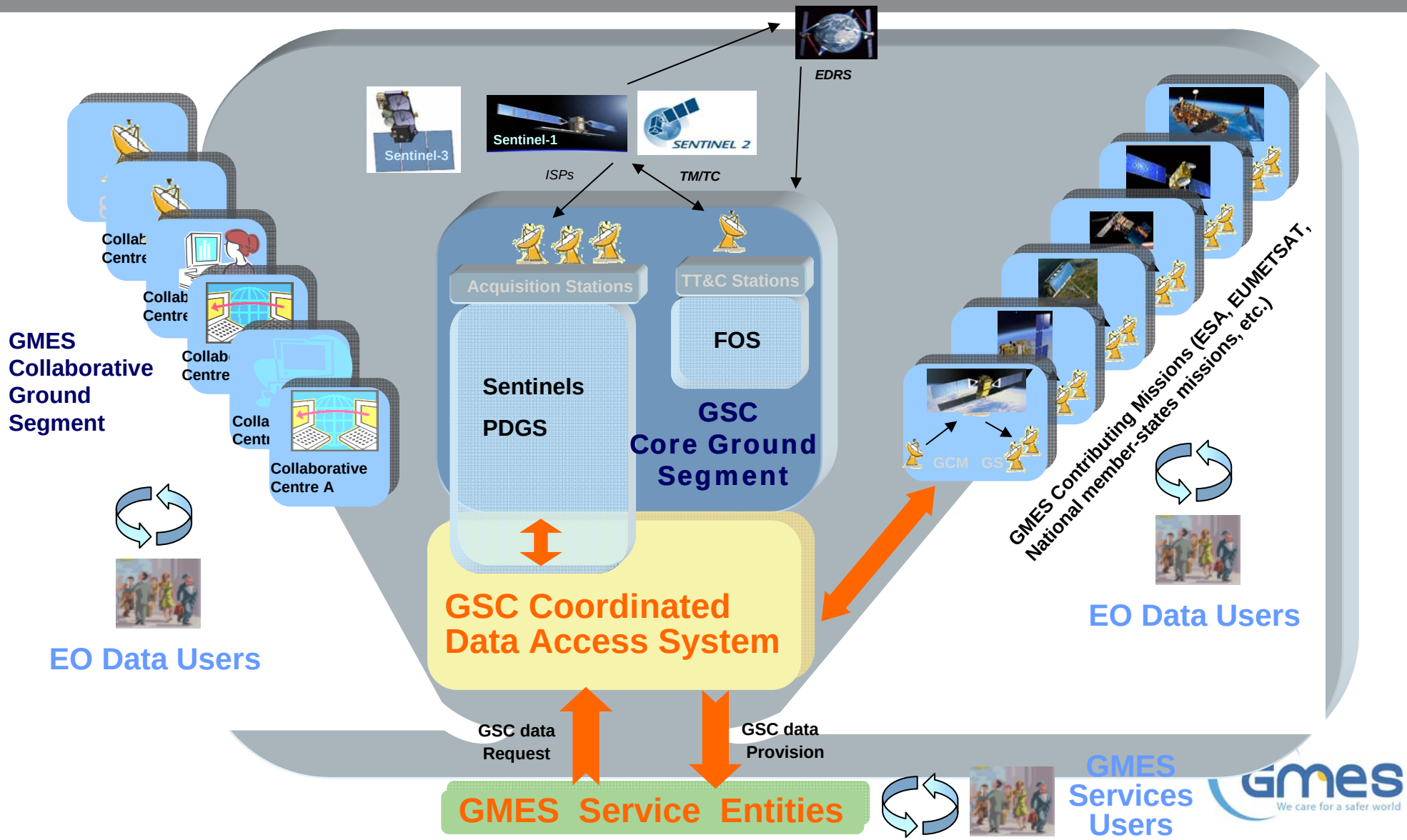
Jason

Available today or planned at European, national and international level

Developed for other purposes but making important data available for GMES

And many more …

GMES Space Component: space and ground infrastructure



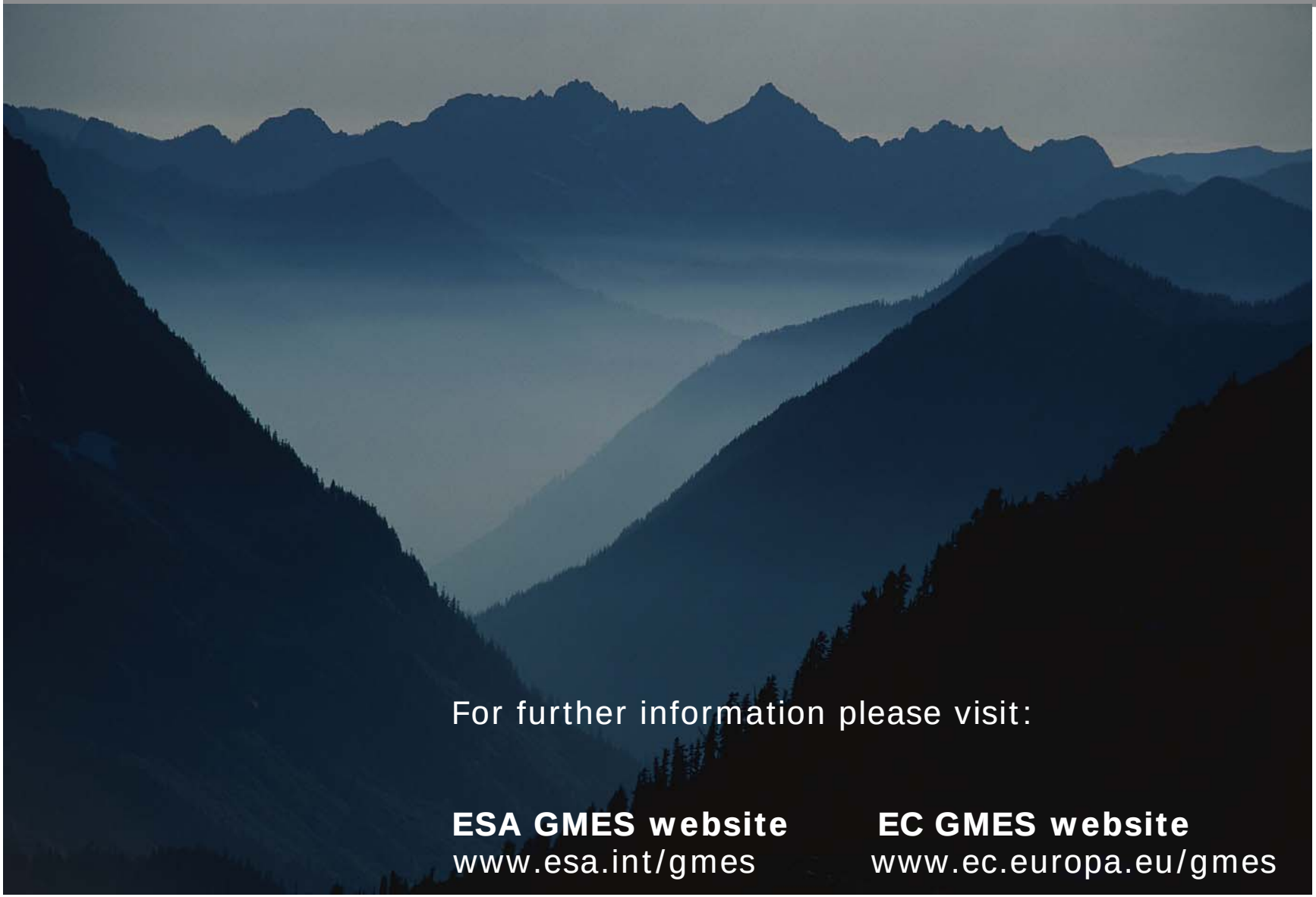
GMES Sentinel Data Policy Principles

FULL and OPEN*

* Joint EU/ESA Data Policy Principles adopted by ESA PBEO in Sep '09, EU approval ongoing

* if not constrained by security or technical restrictions

Further information



For further information please visit:

ESA GMES website
www.esa.int/gmes

EC GMES website
www.ec.europa.eu/gmes