

# ESA AND SECURITY

*Increasing Responsiveness for Civil and Security Actors  
The Space Dimension in Support of Crisis Management*

EDA Annual Conference  
Brussels, 9 February 2010

**Giuseppe Morsillo**

Head of the Director General's Policy Office

# The European Space Agency



- Over 30 years of experience
- 18 Member States
- Five establishments, about 2000 staff
- 3.6 billion Euro budget (2009)
- ESA is one of the few space agencies in the world to combine responsibility in all areas of space activity.
- Over 60 satellites designed and tested
- More than 10 scientific satellites in operation
- Five types of launcher developed
- Over 180 launches made



# The European Space Policy



*In May 2007, 29 European countries (17 Member States of ESA and 27 Member States of the EU) adopted a Resolution on the European Space Policy, adding a new dimension to European space activities.*

Strategic objectives of space for Europe:

- develop space applications to serve Europe's public policies, enterprises and citizens
- meet Europe's security and defense needs
- foster competitive and innovative industries
- contribute to the knowledge based society
- secure access to technologies, systems and capabilities for independence and cooperation

# EU Programmes Relevant to Security

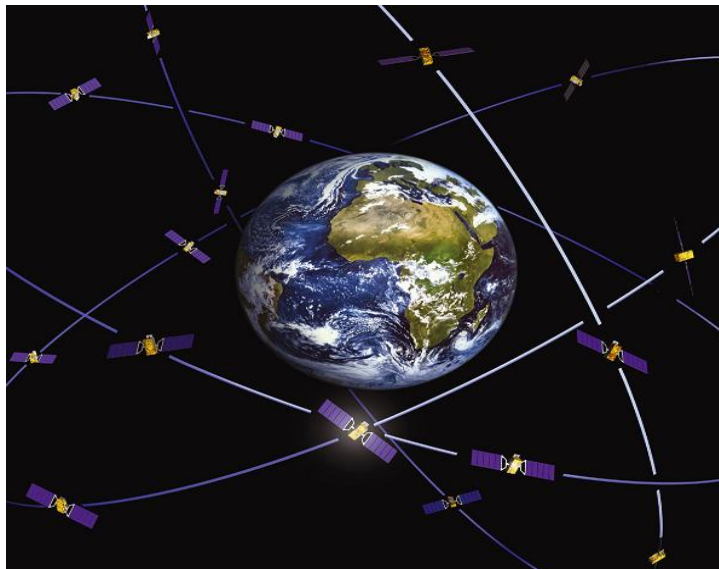
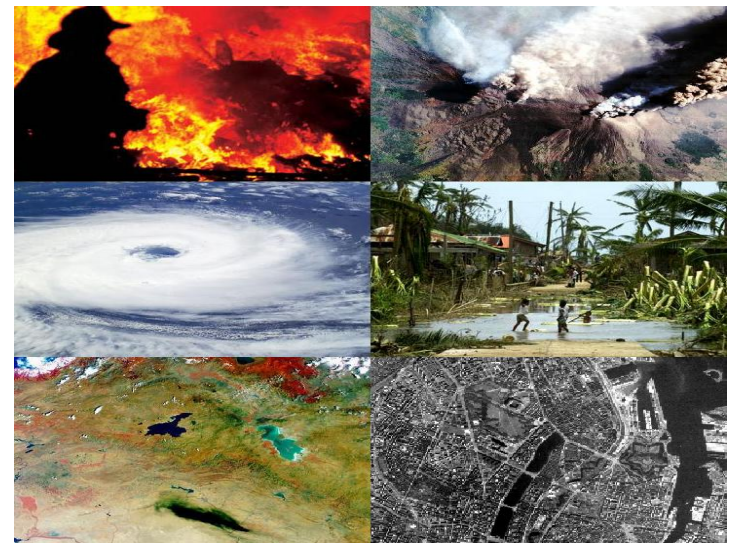


## Global Monitoring for Environment and Security (GMES)

Independent capability for global monitoring

Vital information on the global environment

Supporting Europe's needs for security (e.g. disaster monitoring, crisis management)



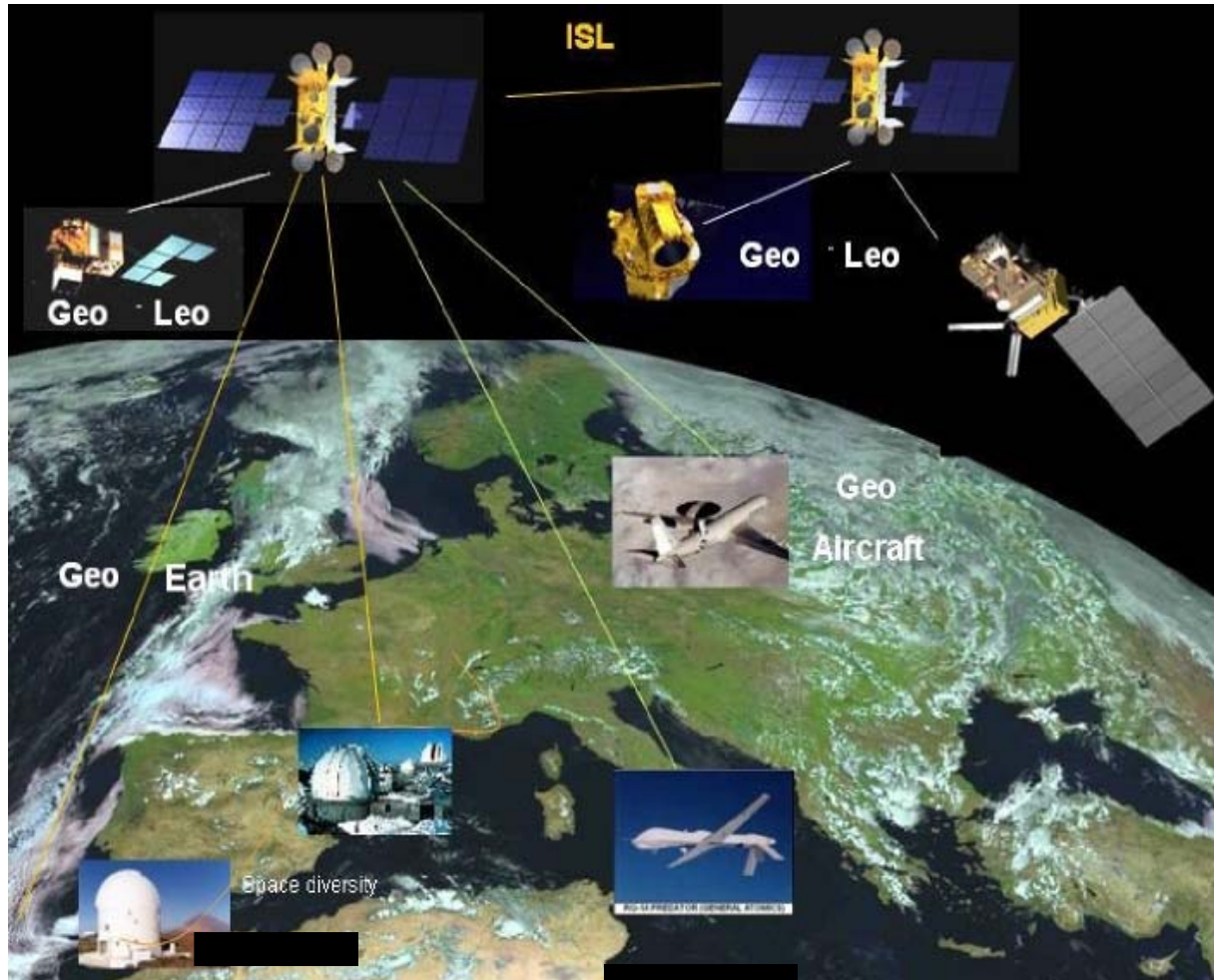
## Galileo

The first joint ESA/EU programme, providing independent capability for positioning, timing, navigation services

Significant strategic importance

Civil programme under civilian control

# European Data Relay System (EDRS)



## EDRS User Focus

- Satellites
- Launchers
- Manned Spacecraft
- Navigation
- Aircraft
- UAVs
- Vessels

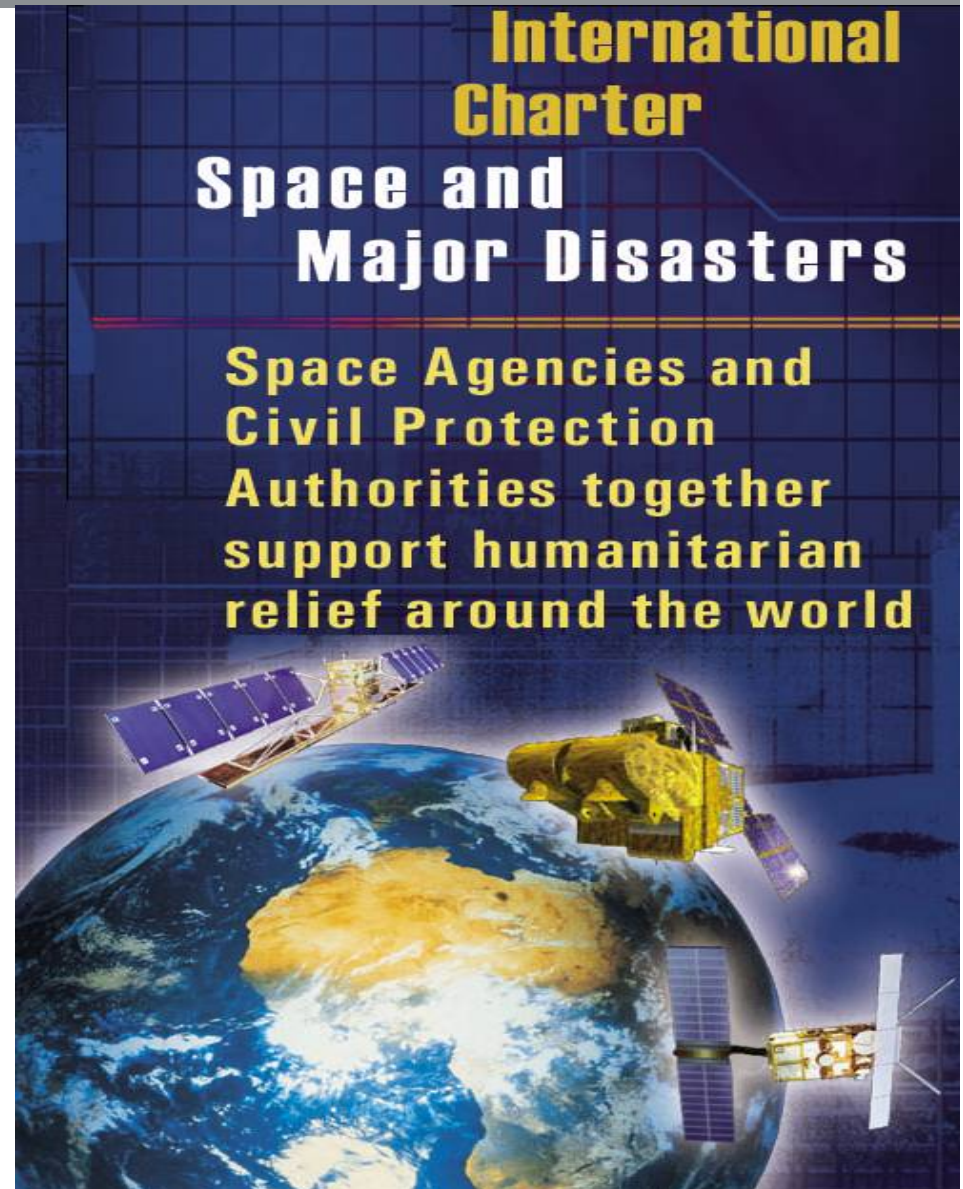
# Major Disasters Charter



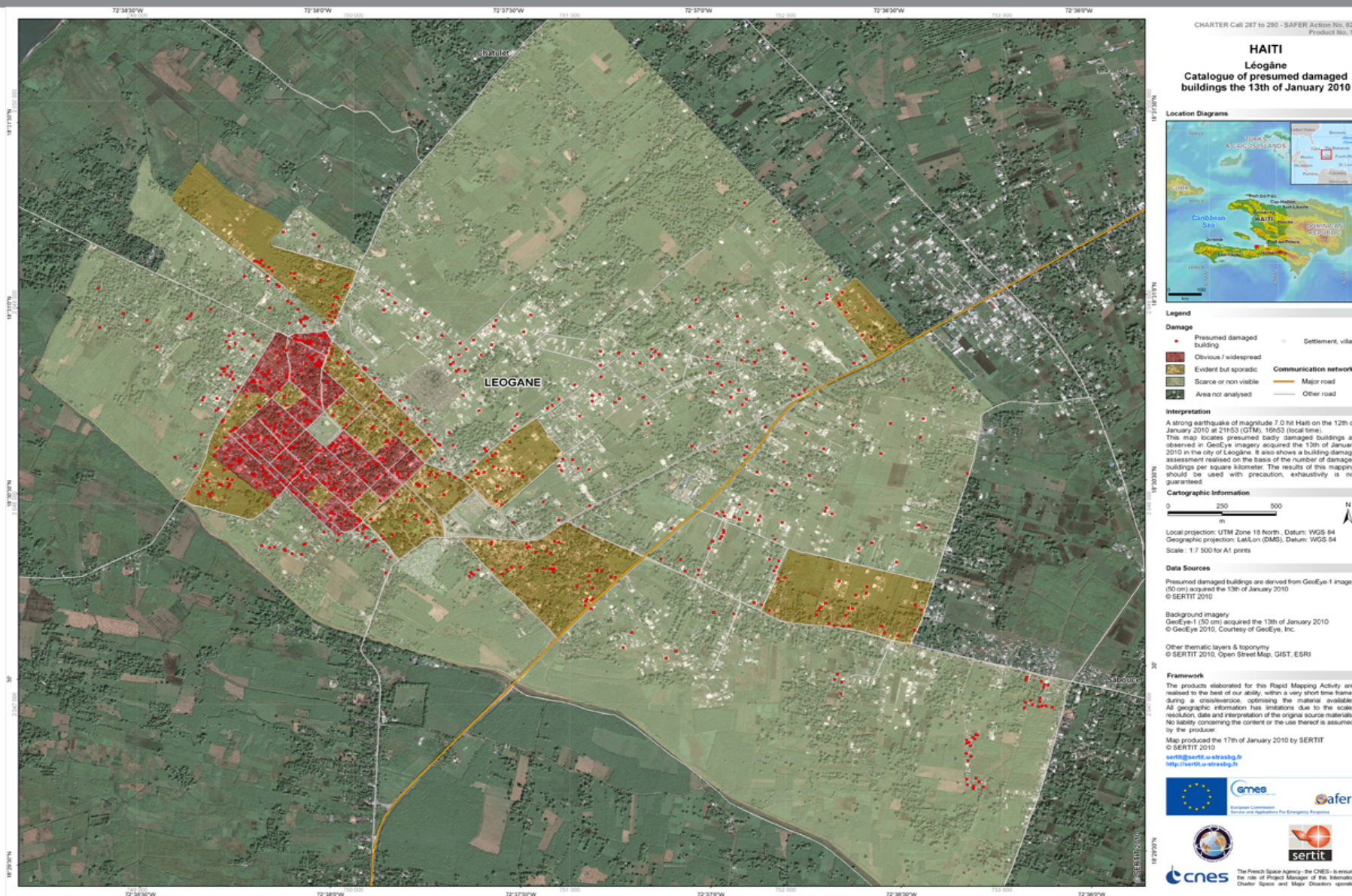
The International Charter aims at providing a unified system of space data acquisition and delivery to those affected by natural or man-made disasters through Authorized Users.

Each member agency has committed resources to support the provisions of the Charter and thus is helping to mitigate the effects of disasters on human life and property.

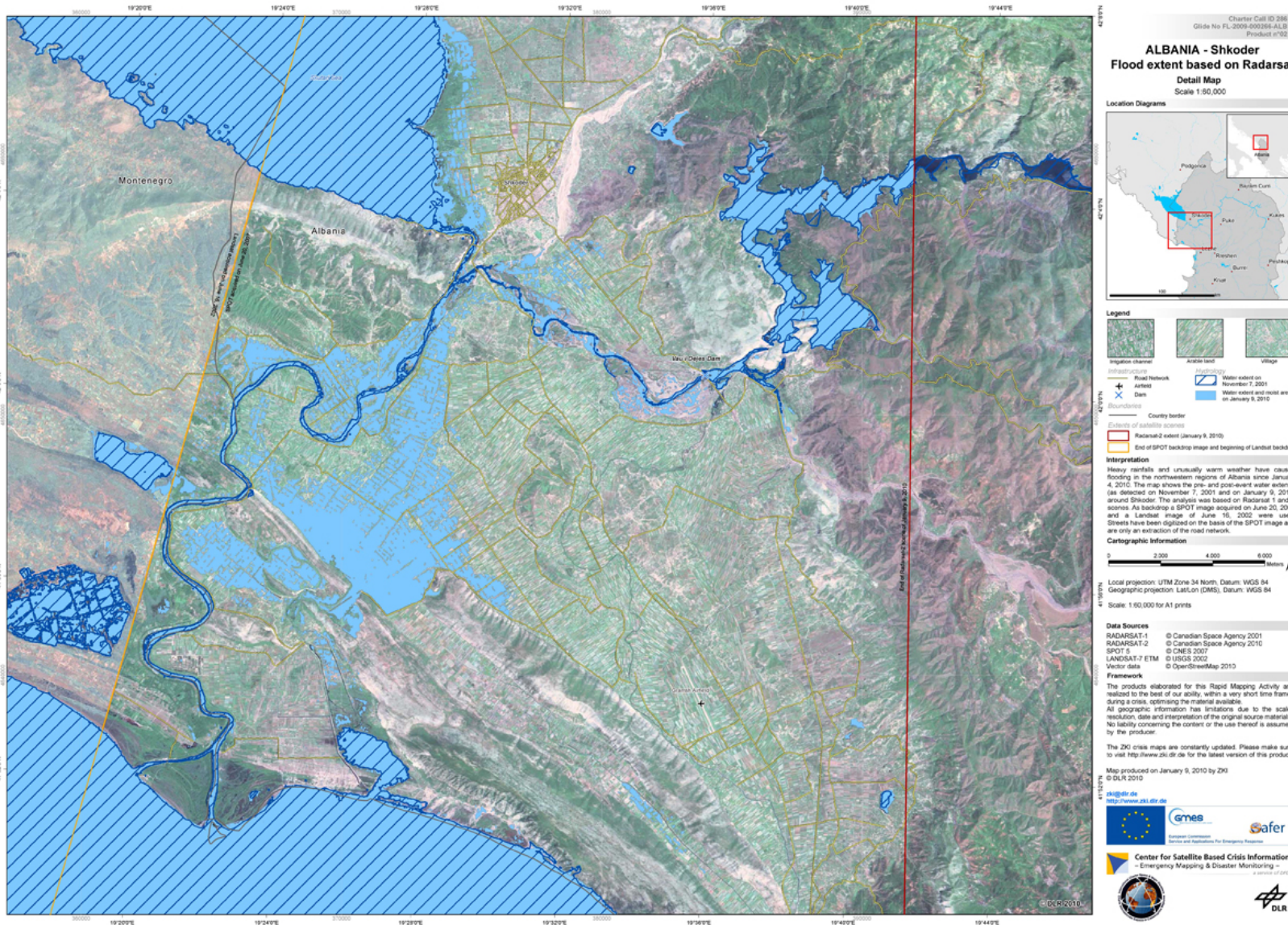
ESA is a founding member of the Charter, which has been in operation since 2000 and which has been activated more than 200 times.



# Haiti Earthquake Damage Estimate

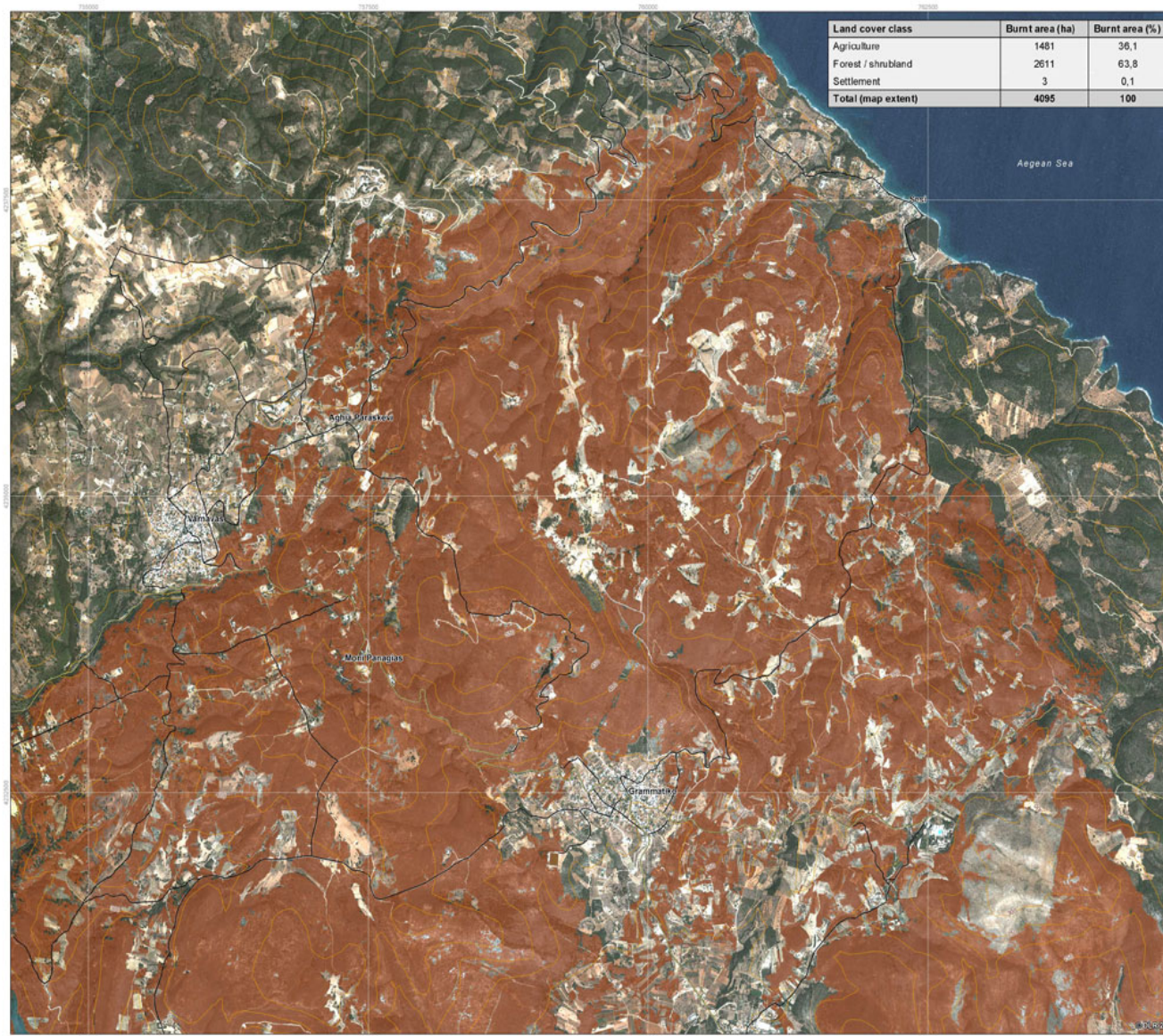


# Floods in Albania (7 January 2010)





# Forest Fires, Greece (August 2009)



Glide No.: WF-2009-050182 GRC  
Product No.: 05

## GREECE - Northern Grammatiko Disaster Extent

Burnt Areas - August 26, 2009  
Scale 1:15,000

**Location Diagrams**

**Legend**

Satellite image information

Analysis layer

- Burnt area
- Topography
- Contour line

Infrastructure

- Major road
- Minor road

**Interpretation**

Several forest fires occurred since August 21, 2009 in the prefecture Attika, north-eastern of Athens, Greece. Many residents had to be evacuated from their homes. The map shows detailed damage information for the region around Grammatiko derived from IKONOS satellite data acquired on August 26, 2009. Streets have been digitized on the basis of Open Street Map data and do not show the entire road network. All information is superimposed on a natural colour image of the IKONOS image from August 26, 2009.

**Cartographic Information**

0 250 500 750 1.000 Meters

Local projection: UTM Zone 34 North, Datum: WGS 84  
Scale: 1:15,000 for A1 prints

**Data Sources**

- IKONOS © e-GEOS (2009), provided under ECE/SA CSC-CA
- SRTM C-BAND © USGS 2000
- Vector Data © Open Street Map, Google Earth 2009
- CORINE Land Cover © AVM 2004

**Framework**

The products elaborated for this Rapid Mapping Activity are realized to the best of our ability, within a very short time frame, during a crisis, optimizing the material available. All geographic information has limitations due to the scale, resolution, date and interpretation of the original source materials. No liability concerning the content of the use thereof is assumed by the producer.

Map produced August 27, 2009 by ZKI  
© DLR 2009  
zkj@dlr.de  
http://www.dlr.de/

Center for Satellite Based Crisis Information  
- Emergency Mapping & Disaster Monitoring -  
www.esa.int

## ESP objectives lead to:

- Exploring policy and programmatic avenues for further implementation of ESP and support to European policies
- Improving civil and defence synergies
- Reducing dependence on non-European critical space technologies
- Strengthening operational, sustainable, cost-effective, integrated security services under European control

## Nature of ESA and cooperation with the EU:

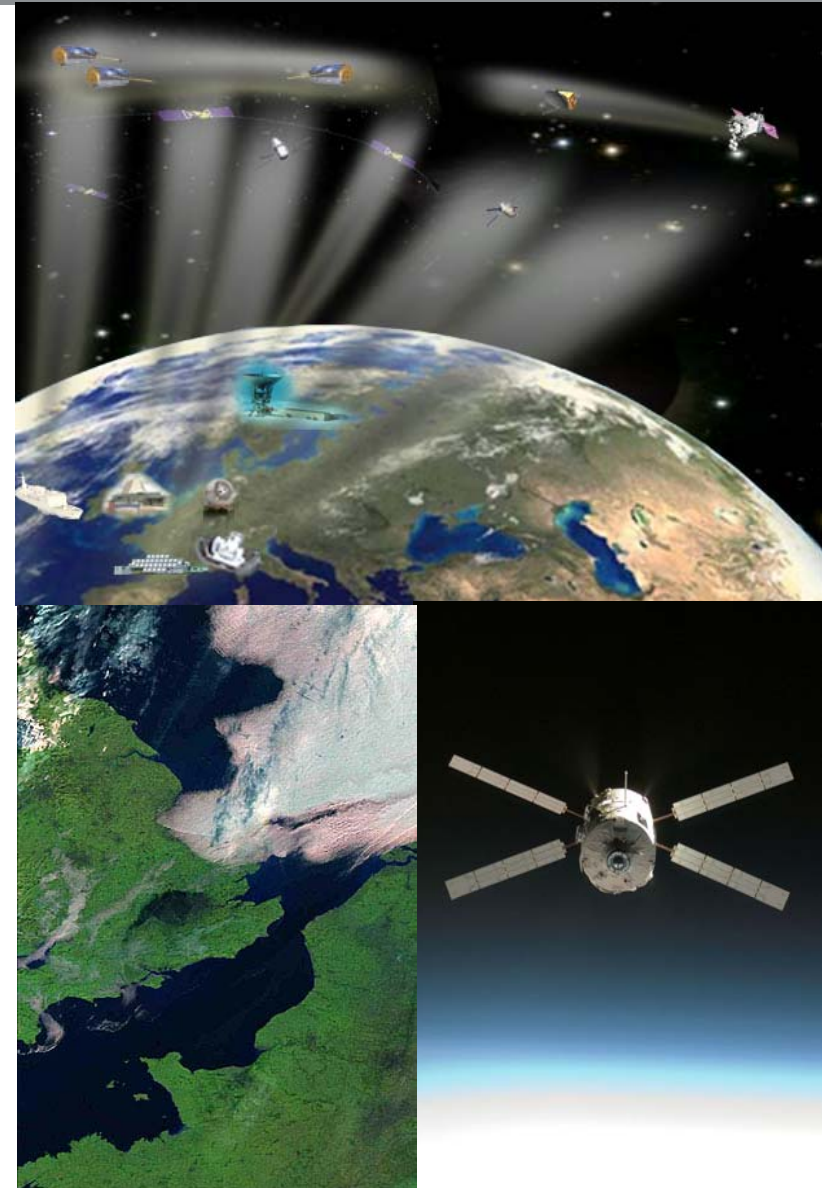
- The ESA Convention does not say that ESA is a civil agency
- The Convention provides that activities must be for “peaceful purposes” interpreted in the light of international space law as “non-aggressive”
- The only element making ESA de facto civil is the source of its funding, today almost entirely civil\*; military funding not excluded; technologies may serve dual purposes
- As per the ESP and respective institutional mandates, political initiatives regarding space for security and defence rest with the EU and its Member States

\* The SSA programme benefits of a 4% contribution from the MOD of one MS

# Taking Forward the Security Dimension of the European Space Policy



- Security as ESP policy priority, highlighted by 5<sup>th</sup> Space Council
- Creation of Structured Dialogue on Space and Security
- 2 ESA-EDA-Commission Workshops
- European Framework Cooperation (EFC)



# Areas of On-Going ESA-EU Cooperation in Space and Security



On top of Galileo and GMES:

- Critical technologies
- Civil/military synergies in Earth Observation
- EFC
- SSA
- UAS Command & Control and ATC Interface via Satellite Link
- Maritime Surveillance

# 2010: A Year of Opportunities



- 2010 will be a key year to further explore avenues in space for security and defence and strengthen on-going programmes taking advantage of the Structured Dialogue process
- Spanish Presidency of the EU will organise a Workshop on Space and Security in March 2010, providing further momentum
- The Commission, EDA, and ESA are reflecting on a possible third joint space for security and defence Workshop in mid-2010
- Further solidify the European Framework Cooperation
- The Seventh Space Council, scheduled in November 2010 under the Belgian Presidency of the EU will be a further opportunity to make progress on space and security cooperation

# Space for Crisis Response Challenges



- During the 16/09/2009 EC-EDA-ESA Workshop on Space for Security and Defence, several users expressed concern regarding the need for more timely access to space data to perform their operations
  
- *"[...] ESRIF also sees a need to continue research on new imaging/sensing capabilities from various platforms: microsattelites, sensors (optical, hyper spectral), and development of standard satellite platforms with autonomous capabilities to increase responsiveness."*
  
- Dependence on foreign sources
  - EUSC uses commercial imagery mostly of non-EU origin (largely US sources)
  - During the first days after the Haiti earthquake, less than 30% of the satellite imagery available to the GMES Emergency and security service were produced by European satellites

# Space for Crisis Response Analysis (1/2)



- A variety of space-based security services are available to European security actors but the majority are not under European control  
⇒ **Demand for European control**
- Existing/currently planned European space-based security services are usually developed in a monothematic framework (e.g. Earth Observation, telecommunications or navigation)
- Even if existing or currently planned programmes could progressively evolve to serve multi-sectoral applications, a large margin for improvement remains with respect to the potential effectiveness of an approach truly integrated from the *early conceptual phase*.  
⇒ **Demand for a more integrated approach**

# Space for Crisis Response Analysis (2/2)



- Based on European existing and available resources, a capability gap exists.<sup>1</sup>
- More responsive services are needed, in particular during the crisis response phase.

⇒ **Demand for more responsiveness**

## The Contribution of Space

To provide European and national security actors with a comprehensive set of space-based services for their missions within and outside EU borders, focusing on support to crisis response with the objective to bring the right information and services to the right people when they need it

⇒ **Space can be an asset**

[1] See e.g. presentations by EUSC, French Civil Protection, EU Military Staff and UNOSAT at the “Space and Security” Workshop, jointly organised by EC, EDA and ESA, 16 September 2009, Brussels; PIRASAT project conclusions; LIMES project conclusions; ESRIF report.



# Towards a European Integrated Approach to Crisis Response



- ESA has begun to reflect on a European integrated space architecture able to support the management of European operations, providing better responsiveness during the crisis response phase
- This architectural concept is based on an integrated space solution within a system-of-systems (SoS) configuration (Earth Observation, Telecom, Navigation), based on the subsidiarity principle, complementing the available infrastructures and services, preparing the relevant enabling technologies, while moving towards future European infrastructures and services

## Users

- Aimed at satisfying primarily civilian needs
- Potentially interested *national* institutions include: Civil Protections, Fire Brigades, Police, Customs, Coast Guards, and officers from Ministries of Defence and Foreign Affairs
- EU institutions, services and agencies active in these domains include: EU Council SitCen, EMSA, EuroPol, MIC and EUSC.

# Further Exploring a European Integrated Approach to Crisis Response



- This architectural concept needs to be further explored through reviews:
  - in the frame of the Structured Dialogue process
  - with ESA Member States in ESA Council
  - in the frame of the EFC as appropriate (as a space contribution)
  
- 2010 will serve as an opportunity to reflect on this concept based on the outcome of the planned consultation with users: the Commission has proposed to take advantage of the process already in place with the GMES Working Groups on Security.