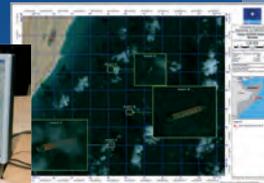


EUSC Annual Report 2009



European Union Satellite Centre

EUSC Annual Report 2009



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A great deal of additional information on the European Union is available on the Internet.

It can be accessed through the Europa server (<http://europa.eu>).

Cataloguing data can be found at the end of this publication.

Luxembourg: Publications Office of the European Union, 2010

ISBN: 978-92-95034-02-0

doi:10.2820/10353

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Printed in Spain

Printed on white chlorine-free paper

The Council

- welcomed the support provided by the EUSC to the military operations of the EU, in particular its support to the operations Atalanta and EUFOR Chad/RCA, as well as its increasing role in support to the EU civilian missions, in particular in the support to the EU Monitoring Mission in Georgia,
- encouraged the facilitated access of the EUSC to governmental imagery, ()
- encouraged the EUSC to continue to explore cooperative opportunities where benefits for further improvement in EU crisis response capabilities could arise.

(Council conclusions on ESDP, 18 May 2009)



Photos, from left to right: Members of the EU Military Committee attending an EUSC briefing; Visit of the Political and Security Committee to the Centre.



Foreword by the Director

Dear Madam/Sir:

Space-based intelligence is one of the key fundamentals for sound European Union decision-making as well as successful planning and execution of EU civilian missions and military operations. Whether for monitoring of pirate-plagued waters off the coast of Somalia or for crisis management of conflicts in Africa or Asia, analytical products and services based on satellite imagery prove time and again invaluable for both senior decision-makers and civilian and military forces on the ground. In order to answer the requirements from its customers, including Operational Headquarters of EU NAVFOR, the EU Civilian Planning and Conduct Capability, EU Military Staff, EU Joint Situation Centre, EU Member States and the United Nations, the EU Satellite Centre, in 2009, further consolidated its access to high resolution governmental and commercial imagery. While the offer of commercial satellite imagery increased, the EUSC continued to closely integrate valuable governmental data from EU Member States into its products, especially from satellites like Helios (France, Italy, Spain, Belgium, Greece), COSMO-SkyMed (Italy) and soon also SAR-Lupe (Germany).

However, satellite imagery is just one part of EUSC products. The other part is the result of the human capacity to understand this data and, through interpretation and enrichment with collateral data, turn it into a relevant, timely and useful analytical product. In the business of information management, data represent only ca. 40 % of the end product, whereas analysis can represent 60% or more. Experienced imagery analysts at the EUSC – optical and radar experts, functional and regional specialists, military and civilian – create the added value that turns satellite imagery into relevant geospatial intelligence. The EUSC has been



developing this core activity for more than a decade now, and 2009 has again proven us right in insisting on this number one priority for capability development.

I hope that with this annual report the reader will gain a better insight into the many-faceted activities of the EUSC in 2009 and learn more about how the Centre supports the EU Common Security and Defence Policy in helping the European Union become a true global actor.

Sincerely,

Tomaž Lovrenčič

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EUFOR Tchad/RCA, Polish patrol, march 2009
© The Council of the European Union

1. Continuous evolution of customer demand

The EU as a major player in the international arena is relying on Common Security and Defence Policy (CSDP) institutions for its external action. In this context, timely, accurate and guaranteed GEOINT is considered a key enabler for both policy planning and execution.

This development provides the framework for the growing demand of the Centre's high-quality and timely products. In 2009, the EUSC has thus been facing the challenge of continuously developing its core area of competence - analysis of satellite imagery - in order to meet the growing expectations of CSDP customers.

Despite the staff's high motivation and expertise to provide a first-class service in imagery analysis to its stakeholders, it became increasingly apparent that the resources devoted to EUSC operations no longer matched the increased tasking by the EU and its Member States.

The EUSC therefore welcomed the opportunity provided by its Board to start a discussion about the Centre's fundamental development and growth strategy, titled the Kiruna debate following a Board meeting in the Swedish city of Kiruna. In 2009 and beyond, the EUSC supports the initiative of fostering this discussion with all stakeholders to provide answers to the developing needs of its customers within the framework of the continuously evolving EU foreign, security and defence policy.



Mission of the EUSC

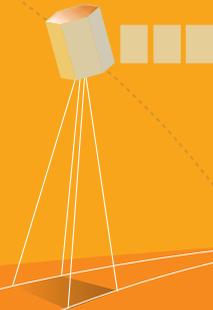
The EUSC supports the decision-making of the European Union in the field of Common Foreign and Security Policy (CFSP) and in particular the European Security and Defence Policy (ESDP). This support consists in providing products and related services resulting from the analysis of satellite imagery and collateral data to:

- the EU Council and its bodies;
- EU Member States or the Commission;
- Third states that have agreed to specific provisions;
- international organisations such as the UN, the OSCE and NATO if the request is relevant to the CFSP, in particular to the ESDP.



Imagery analyst

Today's imagery analysts are requested not only to *extract* information about features on a given location of interest and their mutual relationship, but also to *evaluate* their relevance to specific human activities or environment-related events in the territory. This requires a multifaceted knowledge of the subject being dealt with, often including political, social, economic and industrial issues.



2. Analysis of satellite imagery operational activities

2.1. Development of tasking and products

In 2009, the EUSC continued to support its users in the prevention and management of the following key threats, in coherence with the European Security Strategy:

- Terrorism,
- Proliferation of weapons of mass destruction,
- Regional conflicts,
- Failed States,
- Organised crime.

The Centre carried out tasks in support of the following requirements:

- ESDP operations
 - Support to humanitarian and rescue missions,
 - Support to peacekeeping missions,
 - Tasks of forces in crisis management.
- Early warning and monitoring of crises
 - Battle Damage Assessment,
 - Monitoring of military activity.
- Contingency planning
 - Support to special events security planning,
 - Support to Non-combatant Evacuation Operations.
- Verification of arms control and non-proliferation agreements
 - Monitoring of nuclear related installations,
 - Monitoring of ballistic missile programmes,
 - Monitoring the decommissioning of nuclear weapons.

IMINT versus GEOINT

IMINT (Imagery Intelligence) describes the exploitation of information from satellite and aerial imagery. Analysis of this imagery by specialists turns the information into intelligence for further use.

GEOINT (Geospatial Intelligence) comprises the comprehensive analysis of geospatial information to describe, assess and visually depict physical features and geographically referenced activities on earth. GeoInt data sources include imagery and mapping data as well as collateral data, using all spatial skills and disciplines, including photogrammetry, cartography, imagery analysis, remote sensing and terrain analysis for exploitation.

- General security surveillance over areas of interest
 - Analysis of military installations and activity,
 - Monitoring of sensitive installations and critical infrastructures.
- Exercises
 - Support to and participation in EU and NATO exercises.

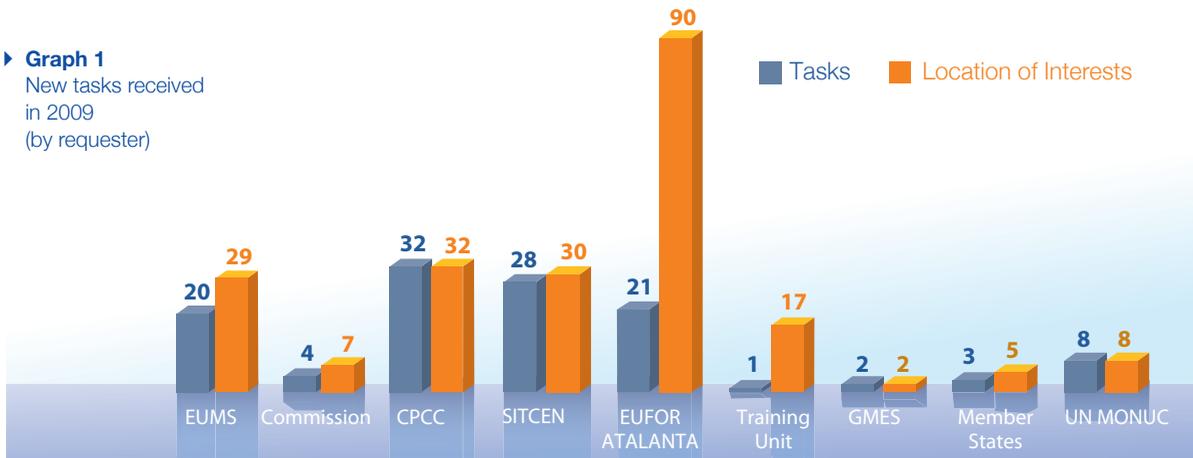
In 2009, the EUSC worked mainly on Council tasks, consolidating the trend from previous years. 116 new task requests were received, representing a small decrease with respect to 2008 (127 tasks).

The distribution of tasks by requester is given below.

These figures do not reflect those monitoring tasks, primarily for non-proliferation and support to EU Operations, for which the Centre continued to provide regular updates, usually on a monthly basis. This cumulative effect on the number of analysis products generated by the Centre is not reflected in the statistics on new tasking.

The breakdown by type of new tasks received by the EUSC (graph 2) shows clearly that these new requests were mostly focused on general surveillance. Major areas of tasking include Somalia, Georgia and DR Congo. Monitoring of military

► **Graph 1**
New tasks received in 2009 (by requester)



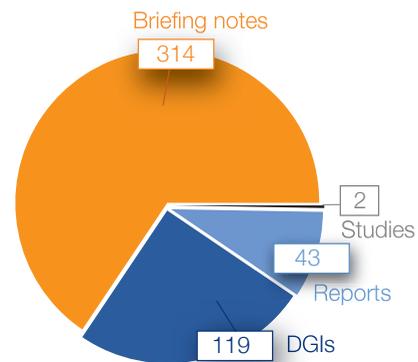


Graph 2
Tasks received in 2009 by type

activity, crisis areas and support to operations became the most requested and highly prioritised tasks.

To the right, the breakdown of product issues by type is given.

The questions asked throughout 2009 called mainly for fast answers, as reflected by the number of briefing notes produced. The call for Digital Geographic Intelligence (DGI) products resulted in the second most requested analysis product, followed by reports.

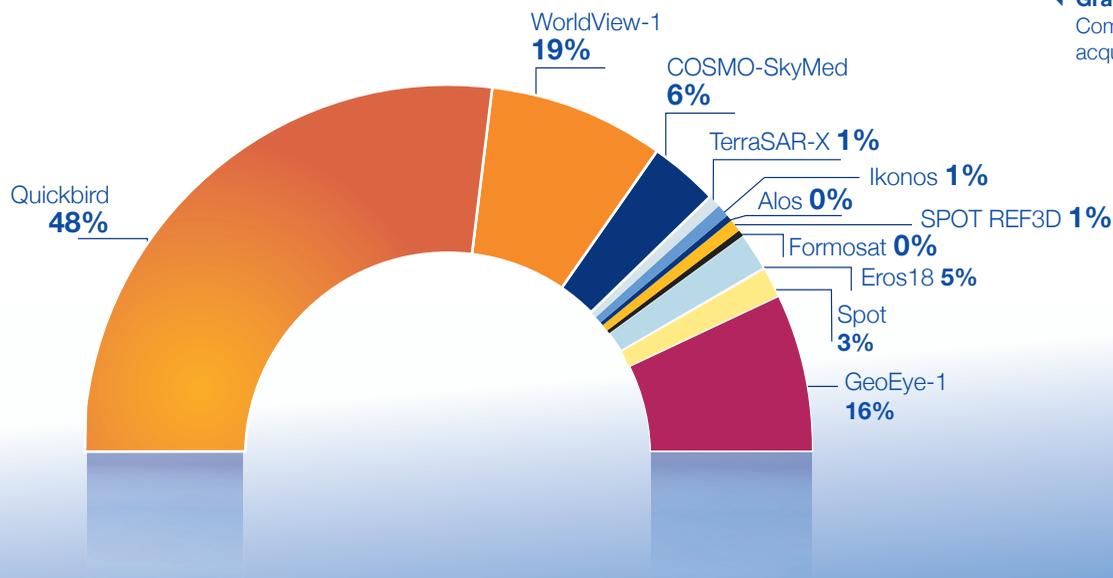


Graph 3
Product overview 2009 (by type)

2.2. Satellite image and collateral data

Acquisition of timely and high-quality satellite imagery is a core prerequisite of the Centre's work. In 2009, the EUSC greatly improved its access to satellite data.

Graph 4
Commercial imagery acquired in 2009

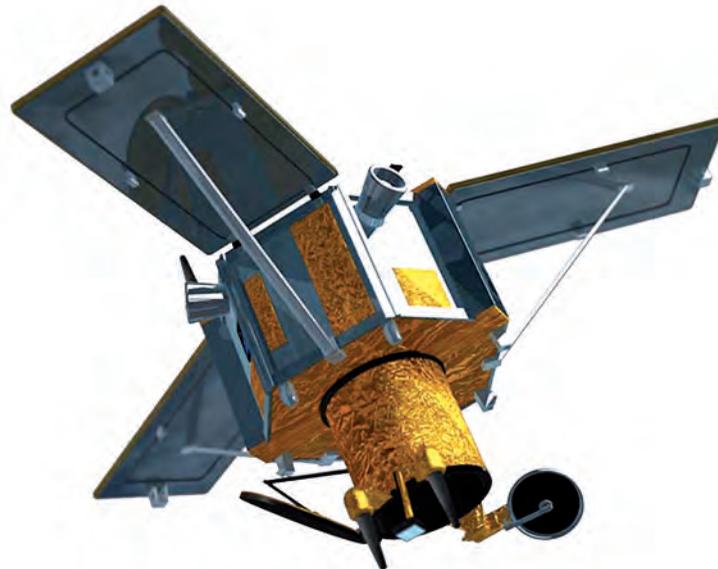


2.2.1. Commercial imagery

The EUSC negotiated contract amendments with the major data providers in order to optimize the budget use, to access new satellite systems, such as WorldView-2, Rapid-Eye, GeoEye-1 and Radarsat-2, and to be granted priority access to imagery. Moreover, discussions took place to prepare agreements for the next generation of imaging satellites (Pleiades, Eros C and others).

Special satellite programming options led to significant improvements in access time to data (i.e. seconds on orbit programming for QuickBird, WorldView-1 and WorldView-2). The EUSC also maintained the urgent reaction procedures with some providers.

Ad-hoc monitoring acquisition plans have been successfully implemented with some providers in order to accomplish the most relevant monitoring tasks, optimizing the costs and the delivery time.





2.2.2. Governmental imagery

Access to governmental imagery has a high relevance to the EUSC due to its high performance guaranteed operational autonomy.

In 2008, the EUSC had signed an agreement on the access to Helios II (France, Italy, Spain, Belgium, and Greece) governmental imagery. This imagery was used in 2009 to support the EU operation in Somalia.

COSMO-SkyMed is an Italian dual-use system which comprises both commercial and governmental satellite imagery. In 2008, the EU had signed an arrangement for access to governmental COSMO-SkyMed imagery. On this basis and in coordination with the Council General Secretariat, a drafting for implementation modalities was initiated in 2009 with expected signature in the near future.

A similar agreement for access to the German SAR-Lupe governmental imagery system was also drafted, and signature is expected for the near future.

2.2.3. Open source collateral data

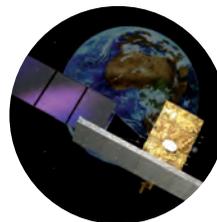
The EUSC is continuously developing its capabilities in the field of open source intelligence to support GEOINT and IMINT.

After a one year trial period, the EUSC adopted a commercial open source search engine, able to find information coming from Internet and other documental source, using a semantic search engine.

The system is now operational and is used to produce a daily internal open source information report over task-related areas of interest.

Helios Satellite (credits CNES)

A second-generation, high-resolution governmental optical imagery satellite for security and defence applications developed by France in collaboration with Italy, Spain, Belgium, and Greece. Imagery is classified at confidential level or above.



COSMO-SkyMed Satellite (credits Telespazio)

An Italian governmental and commercial, dual-use, high-resolution SAR system. It comprises of a constellation of four satellites, of which three are already in orbit. The fourth is scheduled for launch in 2010. The commercial imagery is unclassified and the governmental imagery is classified at confidential level.

SAR-Lupe (credits DLR)

A German governmental high-resolution SAR system, comprising of a constellation of five satellites. The imagery is classified at secret level.



2.3. Support to CSDP operations and missions

2.3.1. Support to CSDP operation in Chad

During the first half of 2009, the EUSC continued to support the EUFOR Tchad/RCA Operation by providing fast response geospatial products to the Operations Headquarters.



"The EUSC () contribution to the geospatial support of the deployed soldiers on the ground with detailed and updated maps of key areas has been an important factor in the overall success of the mission."

"In particular the possibility to benefit from your specially established mission analyst team in support of the EU military mission with access also to non-commercial H lios-imagery was of great assistance."

"I believe that co-operation of this kind could be used as a model for future EU crisis-management operations in order to facilitate and execute operations and get more value from the common resources allocated by the Member States."

*EUFOR Tchad/RCA Commander
General Patrick Nash, May 2009*

2.3.2. Support to EU NAVFOR Somalia

The EUSC received extensive tasking related to pirate activity in Somalia and produced geospatial products to support the Operations Headquarters of EU NAVFOR. These tasks included the monitoring of known pirate bases, not only along the coast, but also around the major offshore islands of Somalia. The known pirate bases were monitored for their infrastructure and activity, including evidence of preparations for pirate attacks. The reporting on the offshore islands included detailed assessments of the suitability of the islands to support pirate operations. A detailed description of the types of vessels used by pirates was provided. In addition, the accurate locations of hijacked merchant ships off the coast of Somalia were also determined.

Also in support of EU NAVFOR, the EUSC completed tasks on other aspects like the search for terrorist training camps in the southern part of the country, the analysis of military activity on the Ethiopian / Somali border, in central Somalia and a Battle Damage Assessment Report on rebel fighting in Somali towns.

[left] Village analysis in Somalia

GeoEye original data
© GeoEye Inc. 2009,
distributed by e-GEOS
© EUSC

[right] Ship activity at Somali shoreline

QuickBird original data
© Digital Globe 2009,
distributed by e-GEOS
© EUSC



2.3.3. Support to EUMM Georgia



Romanian monitors
with IDPs from
Abkhazia in
Saguramo
© EUMM Georgia.

The conflict in Georgia generated an increase in tasking on this area. Initially the requests were related to mapping and GIS products for the planned EU observer mission. Subsequent requests concerned products related to the detection and monitoring of military activity, especially to the movement of military vehicles and personnel. Identification and analysis of Vehicle Check Points and new road construction were also requested by several organizations including CPCC, SITCEN, EUMS and EUMM to support the assessment of the situation on the ground. Currently, the EUSC is still carrying out regular analysis over several specific areas of interest and newly tasked locations.

2.3.4. Support to EU mission to Uganda

Detailed analysis products were created over Uganda. The infrastructure and the surrounding environments were assessed in view of their possible future use in training of Somali Government Forces.

2.3.5. General security surveillance over areas of interest

Tasking of general security interest consisted mainly of detailed analysis of border crossing points in the Caucasus and of infrastructures in the Arabic Peninsula.

2.3.6. Contingency planning - Support to special event security planning (EUSC-NGA Cooperation Project)

The objectives of this joint project was summarised as a way to evaluate the feasibility and desirability of a formal agreement creating a geospatial information exchange between NGA and EUSC .

The expected outcomes are geospatial information packages for a major international event. The products, at unclassified/limited dissemination level, are

intended for situational awareness and security planning, including contingency planning for potential threats to the event.

2.3.7. Verification of arms control and non-proliferation agreements

The EUSC continued to monitor nuclear installations, particularly in those countries suspected of developing an independent nuclear fuel cycle or the means to manufacture nuclear weapons. The latest generation of very high-resolution commercial satellites have proved very useful for the more in-depth analysis of those facilities particularly associated with nuclear weapons manufacturing, such as nuclear fuel enrichment, heavy-water plants, nuclear fuel reprocessing and plutonium production.

Similarly, the monitoring of suspected facilities in states believed to be developing a ballistic missile capability, or space launched vehicle programmes that could be adapted for weapon delivery purposes, was continued.

Other major tasks under this heading concerned the monitoring of the decommissioning of nuclear powered submarines.

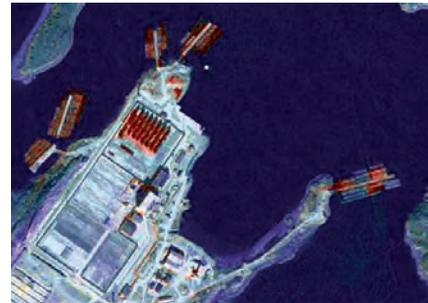
2.4. Operational value of Synthetic Aperture Radar

Synthetic Aperture Radar (SAR) data is particularly useful over regions or locations which cannot be imaged by optical sensors due to cloud coverage, insufficient daylight or during the night (hidden processes or nocturnal activity). The analysis of SAR data in combination with optical images can provide relevant information via change detection. Specific training is a precondition to perform the complex analysis required for the exploitation of SAR data. The EUSC thus conducts twice per year introductory courses on SAR processing and analysis within the GEOINT context.



Airfield analysis

Geoeye original data © GeoEye Inc. 2009, Distributed by e-GEOS © EUSC



Storage of high level radioactive waste.
COSMO-SkyMed data merged with optical QuickBird image

© DigitalGlobe, © e-GEOS, © EUSC

2.5. Improvement of products and services

EUSC continuously strived for further improvement of its products as mandated by its stakeholders.

Products directly related to the elevation model are:

- Creation of relief maps
- Base mapping
- Rendering of 3D visualizations
- Rectification of satellite imagery
- Geographic Information Systems (both standalone and available on the Web)
- Line of sight analysis
- Surface analysis

In order to obtain the above mentioned products in a reliable, efficient, coherent and accurate way, the Centre was using a low cost but efficient approach with the use of Landsat 7 orthorectified imagery as horizontal reference and SRTM data as vertical reference.

In order to meet the growing requirements from the EUSC stakeholders for better accuracy, a change to more reliable and accurate reference data started in 2009. The SPOT Reference 3D products have now been used in several areas of the world where the Centre considers more precision crucial.

TIES

The Tactical Imagery Exploitation Station (TIES) can receive, manage and exploit data from tactical sensors and satellites and elaborate and disseminate IMINT and GEOINT products. It is designed to be used at the operational headquarters of EU operations or deployed further forward.

The European Defence Agency (EDA) demonstrator project TIES (Tactical Imagery Exploitation System) satisfactory ended in December 2008. By then, three TIES workstations were installed in the Operations room of the EUSC.

In May 2009, the EUSC participated with TIES in the exercise European Endeavour 2009 which took place in Wildflecken (Germany). For the first time, a TIES workstation and two image analysts were successfully deployed out of the Centre. GIS products and 3D reports have been produced in response to specific requests and tailored to the scenario.



3D GIS product generated with TIES.
European Endeavour 2009 exercise in
Wildflecken, Germany

© EUSC

The TIES facilities were also used during the TANGO exercise in the Madeira Island. Processing of SAR data and merging of images from different sources were introduced in the exercise.

The global capability of the TIES system has recently been upgraded providing enhanced storage capacity and additional functions.

In October a deployment of a TIES workstation in an exercise with the Spanish UME took place. Georeferenced images from ground were transmitted by satellite communications in near real time. A GIS was updated based on recent satellite image.

TIES is currently available at the EUSC for users' trial purposes. An effective deployment of TIES, at a larger scale, close to an OHQ is under consideration.

2.6. Participation in exercises

Lessons learnt during exercises constitute an invaluable input for the improvement of the planning and decision process. Through its participation, the EUSC is practising the involvement in the EU decision-making process for crisis management.

For the exercises MILEX09 and CME09, the EUSC provided geographical background scenarios as GIS products and thus supported the development of a generic strategic situation with sufficient operational details for the planning and conduct of the exercise.

CME09

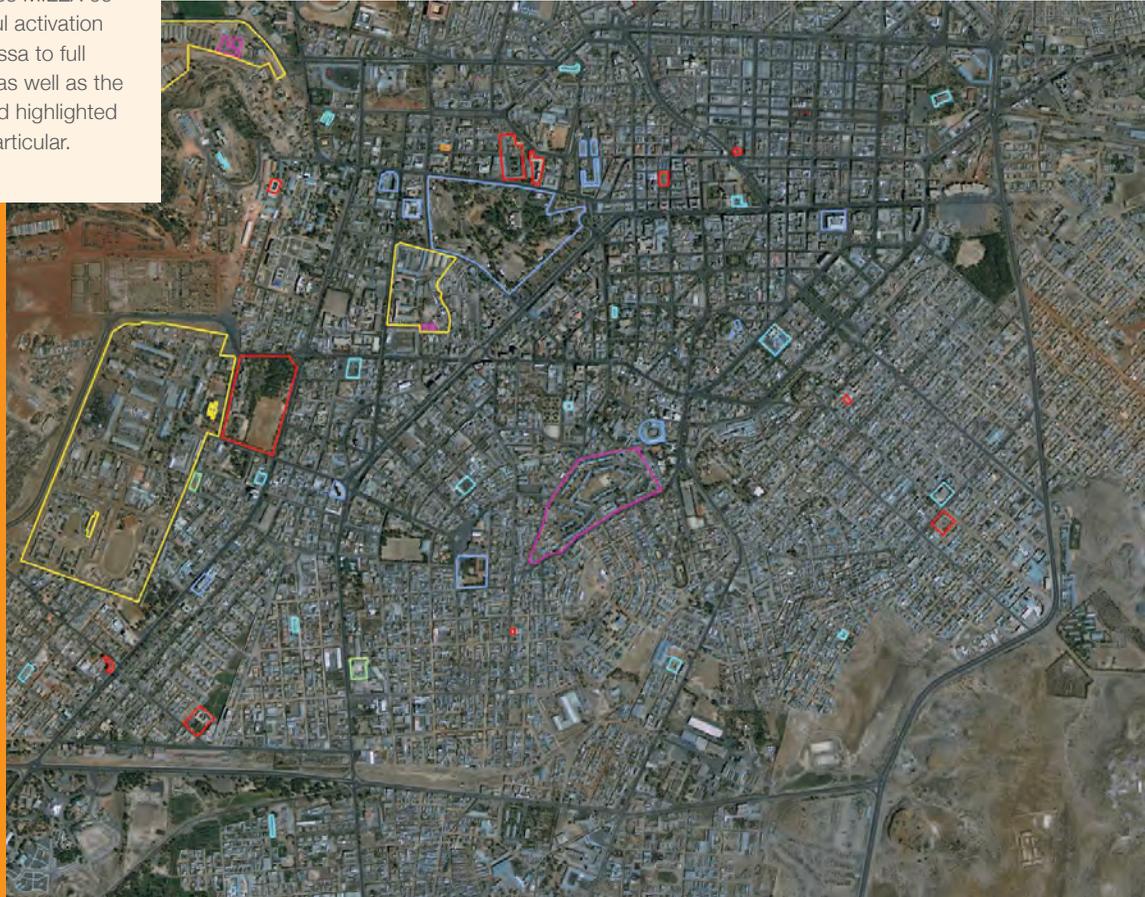
CME 09's aim was to evaluate a range of EU crisis management structures and procedures in the context of a crisis management operation requiring a rapid response without recourse to NATO common assets and capabilities.

MILEX09

The EU Military Exercise MILEX 09 involved the successful activation of the EU OHQ at Larissa to full operational capability as well as the EU FHQ in Naples, and highlighted maritime aspects in particular.

2.7. EUSC Brussels Office

The EUSC Brussels office continued to prove its value in providing support and specialist technical advice on imagery analysis to core EUSC stakeholders. In particular it was of highest relevance in improving specifications of tasking, increasing speed and execution of work, and representing the EUSC in meetings of operational relevance.



CME 09 analysis

Quickbird original data
© Digital Globe 2005,
Distributed by e-GEOS
© EUSC

3. Cooperation in space & security programmes

3.1. Progress on GMES in the security dimension

The EUSC is actively engaged in the Global Monitoring for Environment and Security Programme (GMES). The Centre's current main role, together with its institutional, political and industrial partners, is to develop the programme to an operational level. The EUSC cooperated with the Council General Secretariat and other GMES stakeholders in the definition of the GMES security dimension by:

- providing expertise to the EDA Maritime Surveillance meetings, in particular PT MARSUR,
- participating with the European Space Agency, the EDA, the Joint Research Centre, the Directorate-General for Justice, Freedom and Security, and other stakeholders in the GMES security border surveillance activities organised by the GMES Bureau in the context of EUROSUR,
- contributing to the GMES Advisory Council,
- contributing as experts to the Council Security Committee sub area GMES Data Policy Security working group in charge of writing recommendations on GMES Data Security policy.

During 2009, potential roles for the EUSC in GMES were further defined. These range from introducing the EUSC as a main GMES interface within the CFSP community, and extending the EUSC services to user communities outside ESDP, to placing the EUSC as a key player in accessing future high resolution satellites.

3.1.1. Ongoing projects

The project Land and Sea Integrated Monitoring for Environment and Security (LIMES) has developed applications and services relating to security by combining innovative solutions based on Earth Observation systems and satellite communication and positioning technologies. The services are clustered into three groups.

EUSC potential roles in GMES

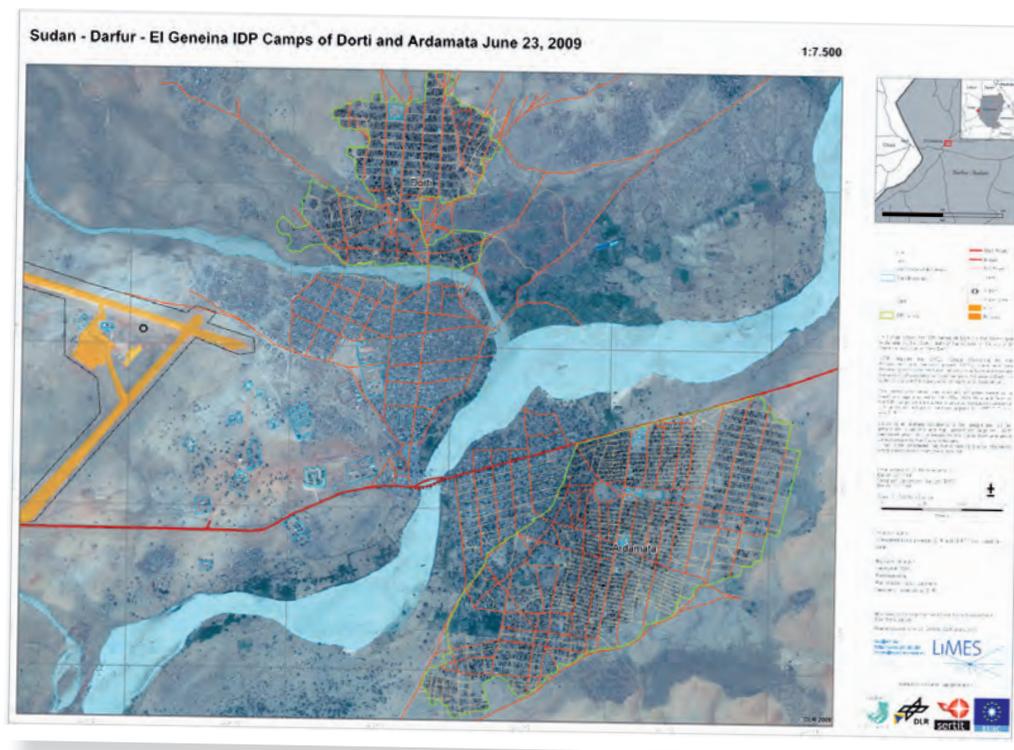
AXIS A EUSC to act as interface between CFSP/ESDP users and GMES services relevant for security and defence applications.

AXIS B EUSC to provide services to customers beyond the sole remit of CFSP/ESDP users, for example civilian first-responders to emergencies or crises inside or beyond EU territory.

AXIS C EUSC to act as a coordinating entity for access to data from space-based systems in support to security applications.

Population
estimation,
IDP camps
West Darfur

© GeoEye (2000),
map produced in the
frame of the LIMES
project



- Maritime Surveillance and monitoring. Several experiments were organized with the participation of referenced users in different areas such as the Atlantic, the Mediterranean and the Baltic, the Caribbean and the Gulf of Aden. These experiments tested the tasking and exploitation of Earth Observation satellites and their associated products for different users in operational situations such as the control of drug or other illicit traffic, the monitoring of sensitive cargo in a piracy context, the monitoring of maritime traffic and the detection of possible threats.
- Land and Infrastructures Monitoring. Tools and services were developed in the field of critical infrastructure monitoring (e.g. nuclear power stations, pipelines, harbours...) and planning of events and border control.
- Support to humanitarian missions. Services have been experimented in the field of monitoring of critical resources or population migrations, management of humanitarian relief and reconstruction in the aftermath of humanitarian disasters.

Regarding Maritime Surveillance, the EUSC participated in a Joint Demonstration on Cargo Ship Surveillance and Non-EU Water Surveillance.

The EUSC hosted a workshop on Non-Proliferation Treaty Monitoring in which analysis tools were presented through training sessions.

The EUSC worked on the Darfur area to contribute to humanitarian aid projects.

3.1.2. New projects

During 2009, the EUSC took part in two new GMES projects within the Seventh Framework Programme for Research and Technological Development G-MOSAIC and SAFER.

3.1.2.1. GMES Services for Management of Operations, Situation Awareness and Intelligence for Regional Crisis (G-MOSAIC)

The G-MOSAIC project aims at supporting EU operations in the prevention and management of external regional crises. In this context, the EUSC is responsible for geospatial support to crisis management operations as well as user engagement, coordination and training. It is also involved in planning for response to crises, treaty monitoring and non-proliferation of armaments.

Numerous global actors in the security domain have been engaged during the year. These include EU entities and national ministries, intelligence centres, armed forces, international organizations, national civil organizations and cartographic centres.

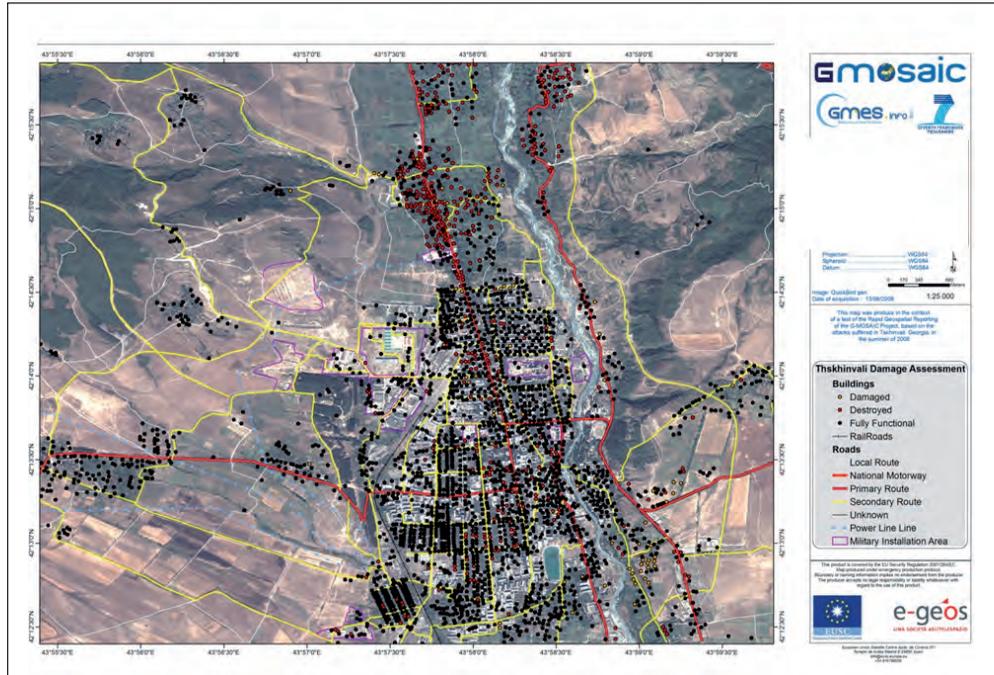
The objective was to support decision making and situation assessments after the crisis in Georgia. The results of the test showed that the service is ready to provide pre-operational support to crisis management operations in a timely fashion.

3.1.2.2. Services and Applications for Emergency Response (SAFER)

SAFER is intended to reinforce the European capacity to respond to emergency situations. Its main objective is to prepare the operational implementation of the Emergency Response Core Service (ERCS).

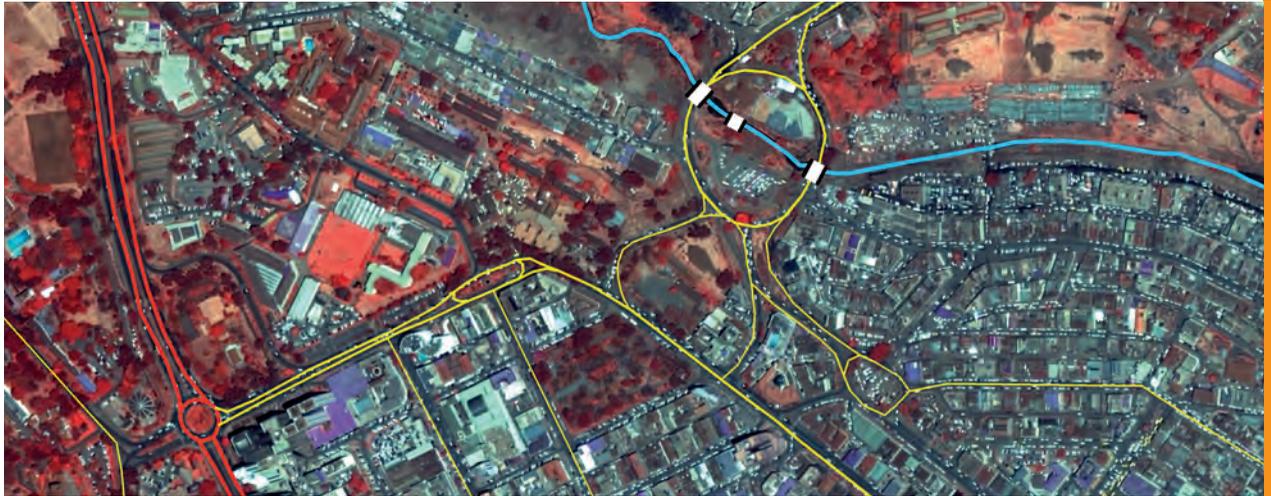
Damage assessment — visual analysis

© QuickBird (2008), map produced in the frame of the G-Mosaic Rapid Geospatial Reporting service



In the frame of this project the EUSC provided rapid mapping services, detailed geographic reference maps and contributed to the implementation of evacuation plans over areas in which emergency situations such as natural disasters, humanitarian disasters might occur. Furthermore, the EUSC had a strong participation in the set up of the operational procedures to be implemented during an emergency service.

During the first year of the project the operational procedures definition has been put in place. These procedures are continuously refined on the basis of the experience acquired. The first image within SAFER project had been received in December 2009



3.2. TANGO project

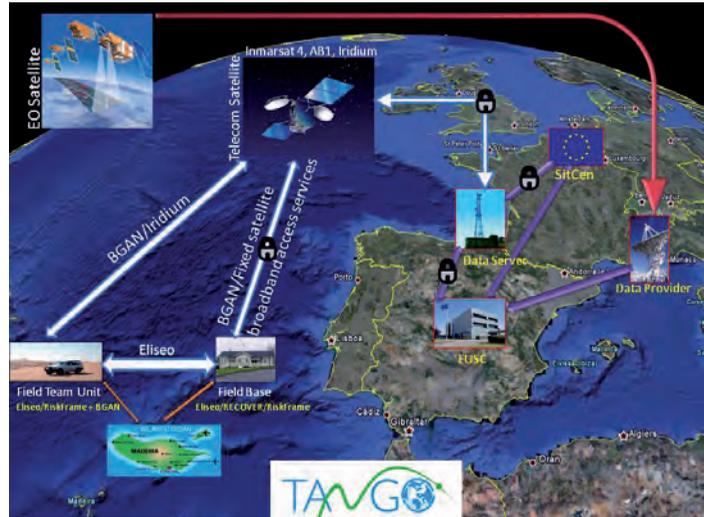
The EUSC-lead evacuation demonstration of the TANGO Project (Telecommunications Advanced Network for GMES Operations) was held on Madeira Island (under the code name of Alania). The scenario simulated a foreign capital that suffered a major crisis requiring the evacuation of EU nationals. Due to the lack of suitable communications, the EU evacuation team deployed its own satcom equipment to communicate through Iridium and Inmarsat satellites that allowed the bi-directional communications with delivery of maps, pictures, voice, text and simultaneous teleconferencing with all the actors in the demonstration. These were the EU SitGen, EUSC as provider of geospatial data, and the deployed team in Alania formed by the Field base and the Mobile unit that was leading the evacuation convoys. The evacuation routes were tracked by GPS by the Field base that delivered the evacuation requirements and its progress to the participants outside of Alania. When evacuation incidents took place, the Mobile unit requested and obtained updated maps of alternative evacuation routes from EUSC. All the satcoms during the demonstration were encrypted.

Evacuation planning

© Ikonos (2009), provided under EC/ESA GSC-DA. Map produced in the frame of the SAFER project.

Satcom architecture of the evacuation demonstration of Madeira Island

Background map: Google Earth; © EUSC



The demonstration was attended by military and civil experts from EU countries and has provided relevant input to increase the operational capability of EUSC as well as its inter-relationship with the EU SitCen. The results of the Evacuation demonstration have been presented in various EU fora.

The EUSC also played an important role in the Maritime Surveillance demonstration of the TANGO project. The objective of the demonstration was to monitor suspect ships in EU waters. To this aim, three situation centres were located in the Port of Rotterdam, in Toulon and at EUSC. These SitCens were equipped with servers receiving Automatic Identification System (AIS) and Long-Range Identification and Tracking (LRIT) data in near-real time. The suspect ships, carrying transmitters, were detected in medium and high resolution SAR imagery.

The TANGO maritime surveillance system installed at EUSC has been demonstrated extensively to EU stakeholders and it could become a relevant EUSC resource to be used operationally in future maritime surveillance tasks.

The EUSC also participated in the CISTIC telecommunications exercise organized by the Spanish UME (Unidad Militar de Emergencias). The objective of the exercise was the use of the mobile telecommunications of UME so that EUSC could receive

and deliver geospatial products from and to UME headquarters in the field where EUSC had deployed the TIES workstation.

The flexibility of UME communications allowed autoswitch for a number of sophisticated telecommunications resources. Bidirectional communications between EUSC and headquarters in the field were facilitated by satellite Internet. This exercise was a useful experience to increase the operational capacity of EUSC and to facilitate future cooperation in this field.

3.3. Cooperation with the European Defence Agency

During 2009, EUSC personnel participated in OSINT (Open Sources Intelligence) pilot courses at EDA having direct relation with their current tasks. A total of ten imagery analysts participated to five different courses for a total duration of ten weeks.

The EUSC also contributed to the demonstration phase of the CSUI (Common Standardised User Interface) project led by EDA.

The EUSC participation in the EDA MARSUR (Maritime Surveillance) project team and attendance to its working group and the visit of the Wise Pen Team shed light on the priorities to be developed in support of EU NAVFOR Atalanta.

The EUSC participated for the first time in a workshop organised by EDA on MUSIS aiming at evaluating the access to next generation dual-use and governmental satellites from 2015 onwards.

The participation in the Project Team on Intelligence Surveillance Recognition and in the Project Team on NEC (Network Enable Capability) continued during the 2009.

3.4. Space Situational Awareness

The Space Situational Awareness (SSA) programme refers to the knowledge of location and function of space objects and space environment, including operational satellites, space debris, near earth objects and space weather. The development of a European system will underpin the exploitation of space assets,



a key capability contributing to autonomous access to space for the EU (as requested by the European Space Policy, drawing on existing capabilities and infrastructures at national as well as European level).

During 2009, the EUSC cooperated with the European Space Agency and the European Defence Agency on their respective activities for SSA. The operational experience of the EUSC in managing commercial and governmental data together with its experience in handling different levels of confidentiality is seen as a key asset in this context.

In December 2009, the EUSC submitted a supporting action proposal within the seventh research framework programme of the European Commission to contribute to the technical definition of SSA services and to participate to the validation of critical precursor SSA services such as satellite conjunction warning, satellite over flight alert and space debris re-entry prediction.

4. Training activities

The primary objective of the Centre's training service is to enable its analysts to deepen, update and capitalize their knowledge. In line with the lately modified EUSC mission statement, any available training places have been offered to Member States which routinely send national experts to attend courses at the EUSC.

4.1 EUSC training courses

The EUSC offered the following training courses in 2009:

- **Initial Training** (officially *Formation Initiale*) is given to EUSC newcomers to familiarize them with the Centre's procedures and practice. It includes training on digital image processing, satellite and sensor characteristics, EUSC standards, imagery analysis and basic reporting of different categories such as airfields, ports and harbours, lines of communication, industrial installations and terrain analysis. The course was given twice in 2009.
- **Interpreting Industrial Installations** consists of two consecutive modules focusing on the use of commercial satellite imagery to monitor specific industrial installations such as oil refineries, water treatment plants and heavy industries. Part of the course is dedicated to the analysis of case studies with ad-hoc assignments.
- **Interpreting Nuclear Installations** details the use of commercial satellite imagery to monitor the status of nuclear facilities. It illustrates the entire nuclear fuel cycle, gives satellite interpretation guidelines and includes practical exercises.
- **Radar course** provides an introduction to Synthetic Aperture Radar processing and analysis within the ImInt / GeoInt context. The course includes a tutorial about image generation and interpretation guidelines for several categories (i.e. STANAG 3596). It is composed of theoretical lectures and in depth practical exercises.

- **Interpreting Military Forces** contains information on the basic structure of military forces. It enables attendees to assess composition, capability, role, readiness, etc. of different types of military units and identify their role within a particular military force. Theory is supported with practical examples and exercises.
- **Introduction to GIS** focuses on the use of geographic information systems when collecting, organising, analysing, disseminating and using geospatial information. Theoretical fundamentals of GIS architecture and functionalities are supported with practical exercises.

In total 88 trainees – 31 EUSC and 57 external – attended the above-mentioned courses.

4.2 Other training activities

The EUSC organised a set of short courses for staff only, e.g. to strengthen the use of GIS tools and products or to refresh given elements of the Nuclear Fuel Cycle. Furthermore, for external attendees, a two week GIS Introduction course had been delivered at EUSC for FRONTEX; a two week Introduction to IMINT course had been delivered in Helsinki for the Finnish MoD; and a two day NFC refresher course had been held at the Scuola di Aerocooperazione, Rome, in the frame of the training agreement with the Italian MoD. In total, 35 personnel were trained on these courses.

An in-situ visit to the Trillo Nuclear Power Plant, Spain was arranged for EUSC analysts. Several external lecturers gave ad hoc seminars, particularly on nuclear proliferation. The Training Section was also heavily involved in the preparation of an SSA-related support action proposal within the third FP7 space call.

5. Resource management

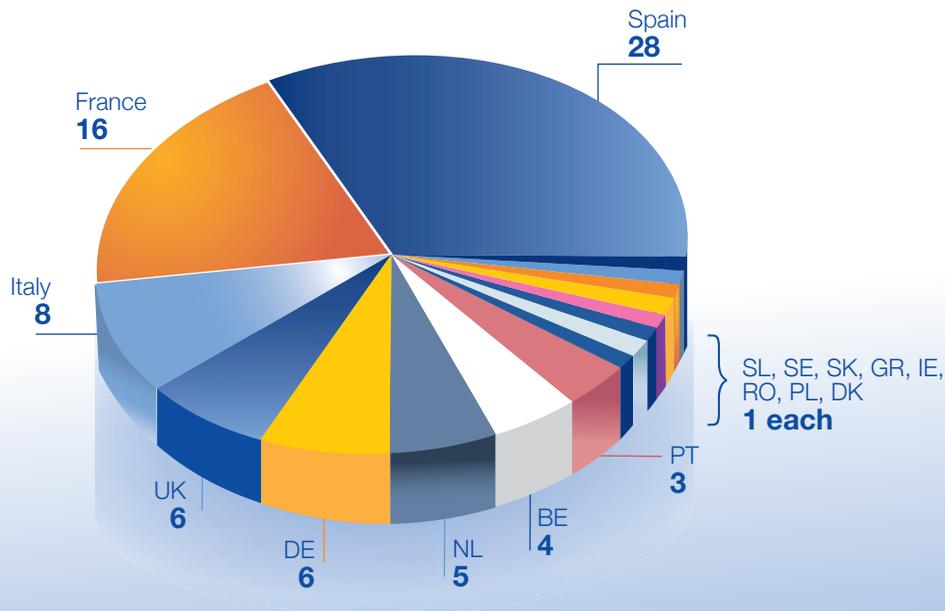
5.1 Personnel

5.1.1. Staff

On 31 December 2009, the EUSC Director Frank Asbeck completed his second mandate. He was succeeded by Tomaž Lovrenčič, elected to the post by Member States on 23 September 2009 to start his mandate on 1 January 2010.

In 2009, six vacancies were filled, including four posts as imagery analysts and two Heads of Division. As at December 2009 the Centre comprised 84 staff members and 11 local staff.

The geographical distribution of EUSC staff is shown below.



◀ **Graph 5**
Distribution of posts
by nationality,
2009

With the new Staff regulations in effect, internal vacancy notices for the posts of the Deputy Director and the Head of Finance were published, followed by external vacancies. Due to the resignation of one staff member, the post of the GMES Financial Assistant was internally published.

During 2009, the Centre hosted three seconded national experts (SNEs) from Finland, Greece and the UK.

5.1.2. New Staff Regulations

On 28 April 2009, the Director presented his recommendation for amendment of the Centre's Staff Regulations to the Council General Secretariat. At its meeting on 8 June 2009, the Foreign Relations Counsellors Working Party examined the proposal and reached agreement on it.

After the EUSC Staff Regulations were finalised by legal/linguistic experts, the Council Secretariat suggested the Permanent Representatives Committee on 25 August 2009 to include the document in the agenda of its meeting on 3 September 2009. This Committee adopted the Staff Regulations at its meeting on 3 September 2009 and they came into force on 1st October 2009.

5.1.3. Pension scheme

The Satellite Centre signed agreements on transfer of pension rights with EUROCONTROL, ECMWF, WEU, OECD and ESA. These agreements will allow a smooth transfer of pension rights in case a staff member moves from one organisation to another and will be applicable to both the EUSC Pension Scheme and the EUSC New Pension Scheme.

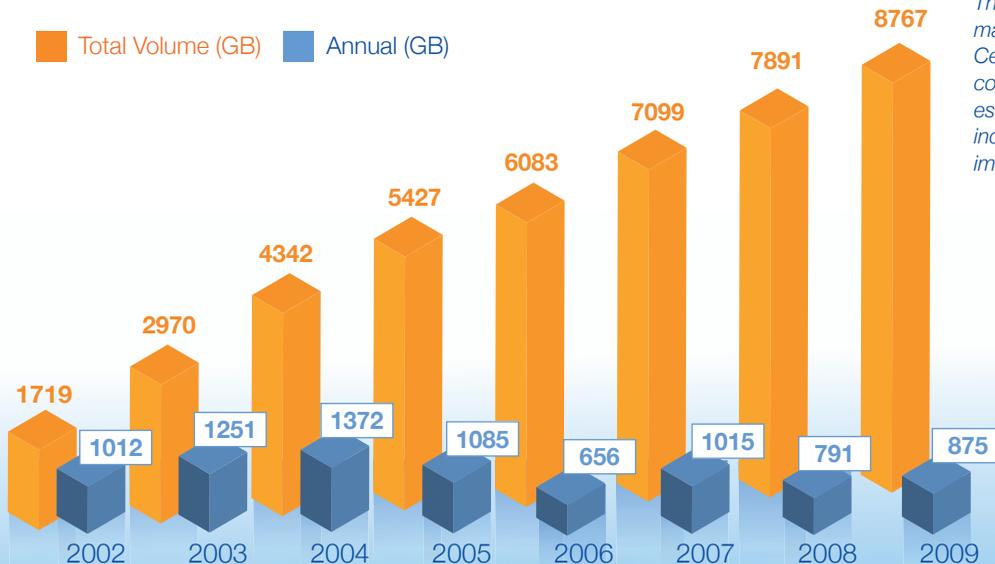
5.2. Information and communication technology

Reliable and secure information and communication technology is critical for the daily functioning of the Centre. As an operational agency working with classified data, full compliance with the EU Council Security Regulations has to be ensured.

5.2.1. Infrastructure

Increase of performances: In order to cope with the increasing volume of data to be processed, the performance of the operational network of the EUSC has been greatly improved in terms of speed and storage capacity.

Simplification of networks: The general IT infrastructure of the EUSC is in the process of being simplified from 4 to 2 networks (classified and unclassified) in order to ease the internal workflow through collaborative tools and paperless administrative procedures.



► Graph 6

Data Volume in gigabytes.

The data volume managed in the Centre's archive is constantly growing, essentially due to the increasing size of the imagery data.

Reclassification of the Operational Network: This SECRET EU network is regularly inspected to maintain its classification level. Each inspection identifies updates to follow the evolutions of risks, standards and regulations. Modifications were conducted in 2009 and the corresponding inspection is scheduled to take place in the first half of 2010. On this basis, the interconnection between this operational network and the EU OPS WAN system could be a next step.

5.2.2. Development projects

Data Dictionary: The work has centred on the effort towards a common data dictionary and data model, aimed at enhancing interoperability of spatial data sets and services. It is driving the in depth specification of upcoming EUSC online products (e.g. layers coherence, symbology management, product identification and versioning). It is supporting the EUSC data dissemination strategy, including means for a customized and secure online product dissemination infrastructure to EUSC end-users and operational partners.

Electronic tasking process: The current tasking process of the EUSC is done today through paper or simple electronic documents. The goal of the electronic tasking process project started in 2009 has been to develop a tool to automatically generate and transfer tasking requests from the originator through the EU Council to the Centre.

5.3. Quality

The EUSC continued directing its improvement actions to strengthen the effectiveness of the Centre's management and its general functioning.

The Centre systematically collects user feedback. This practice aims at evaluating the perceived quality of the Centre's products and services and triggering improvement actions as appropriate. Quality is measured in terms of completeness, consistency, accuracy, usability, understandability and timeliness.

The level of user satisfaction with the EUSC products and services in 2009 confirmed a high and very balanced distribution over all the quality factors.



5.4. Security

The security system of the EUSC is one of the defining points of the institution. It is of prime importance for the EUSC to be able to guarantee operational security, safeguard EUSC employees, create a secure working environment, protect EUSC assets, resources and information, protect EUSC activities and justify the trust of the Centre's stakeholders.

This objective was achieved by strengthening procedural, technical and architectural security, by appropriate functioning of the security office and security guards, and by ensuring a high level of employee awareness and commitment.

The EUSC continued liaising with the Council Security Office (the Council Security Regulations are applied directly to the EUSC) and with the Spanish National Security Authority.

As part of a permanent process, the EUSC performed regular review of procedures and inspections of compliance and applied corrective measures after due process.

▲ Graph 7

User Feedback Analysis 2009 — user satisfaction vs. product quality factors

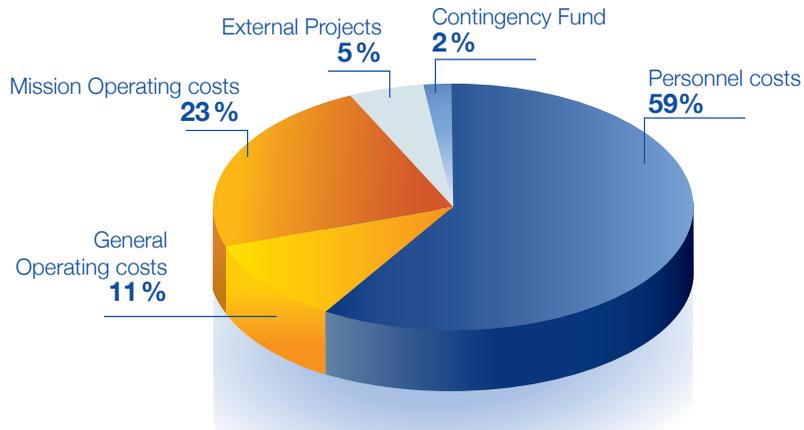
5.5. Finance

5.5.1. Approval of the Budget for 2009

At its 54th meeting, the Board approved the 2009 Budget with a total amount of 15.917.631 EUR. Out of this, 12.200.335 EUR were financed through Member States contributions representing an increase of 0.84% over the inflated 2008 contributions.

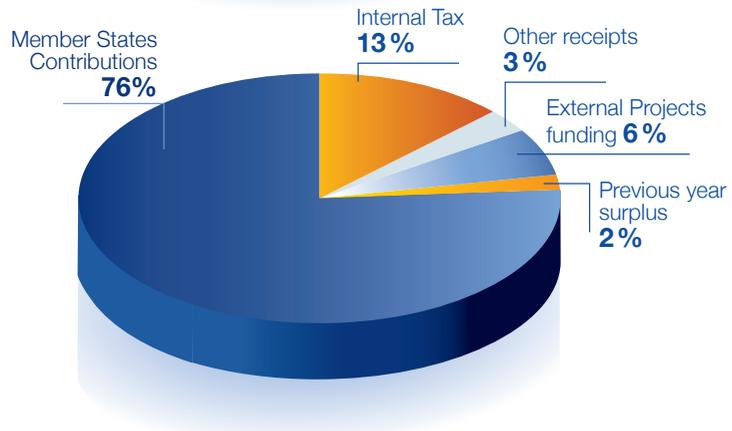
The following chart shows the composition of the initial EUSC Budget by expenditure chapters.

► **Graph 8**
Budget 2009
by cost categories



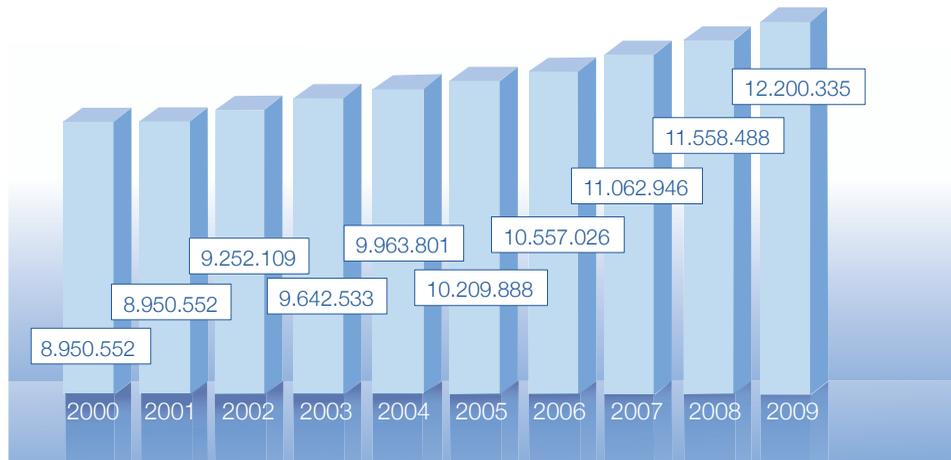
The income sources of the EUSC Budget 2009 are depicted below.

► **Graph 9**
Budget 2009
by funding sources



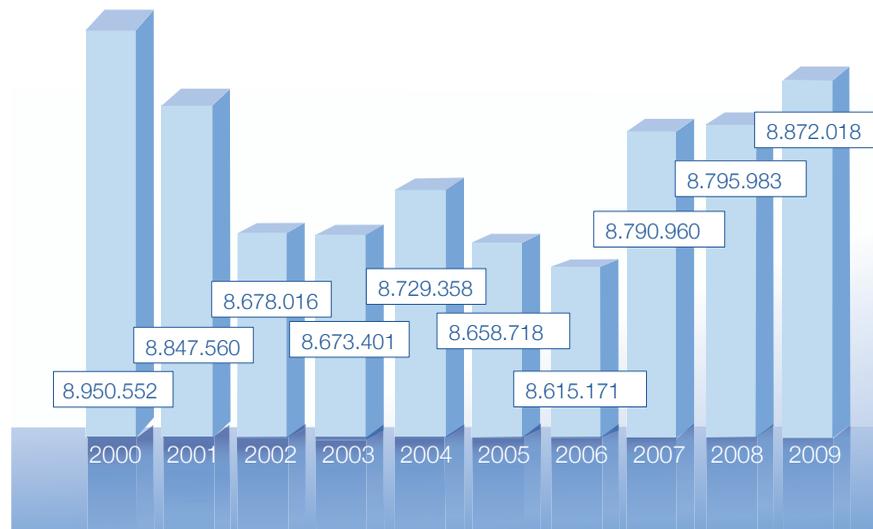
5.5.2. Budget evolution

The charts below compare the evolution of the Centre's approved budget (Member States contributions) in nominal and in real terms from 2000 to 2009.



◀ **Graph 10**
Budget evolution
in absolute value
(Member State
contributions)

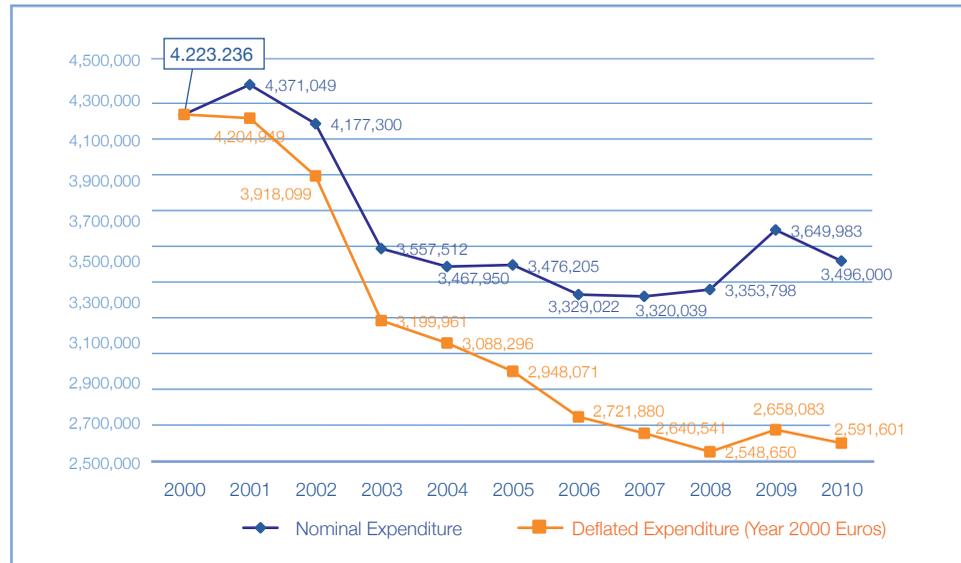
Despite the increasing trend shown above, the following table shows the flat trend when comparing the different budgets given in year 2000 fixed euros. It can be seen that the 2009 budget still remains below the year 2000 level.



◀ **Graph 11**
Budget evolution
in real terms
(Year 2000 fixed
Euros)

The decreasing trend of the expenditure in Chapter III, the Operational funding chapter, also has to be highlighted. In deflated figures the expenditure in Chapter III in 2009 amounts to 63% of the Chapter III expenditure in year 2000. This decreasing trend will continue with the 2010 Budget.

► **Graph 12**
Operational costs expenditure
(Comparison nominal expenditure vs. deflated expenditure)



5.5.3. Financial Management

A new accounting system was implemented after customizing it to EUSC needs. It allows for a more efficient workflow and for new reports to support the financial control.

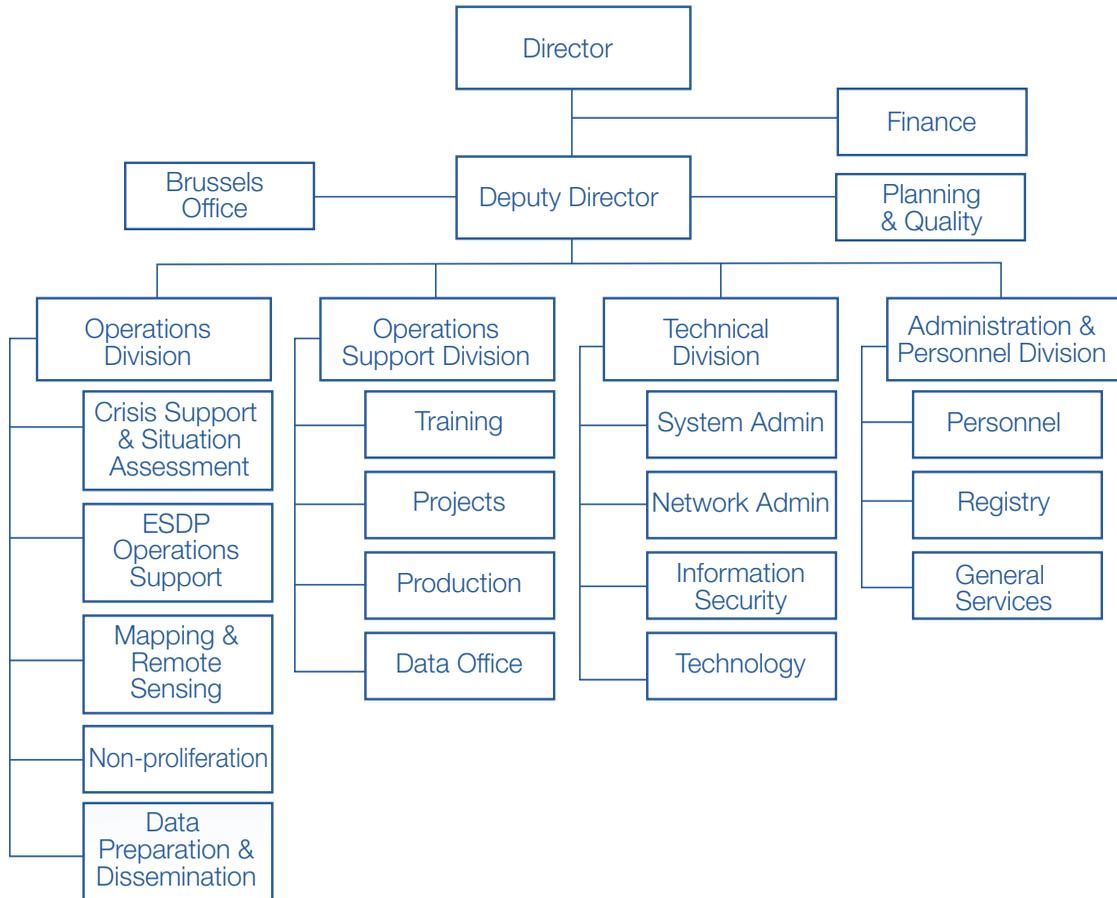
During 2009, most indicators of the financial management have improved.

5.5.4. College of Auditors

The EUSC College of Auditors completed the 2008 audit in March 2009 with a positive result.

ANNEXES

Organisation chart



ANNEX II

Meetings and events

The Centre has received and organised the following visits and meetings:

- 8 January: Mr. Dumont, Minister Counsellor, Belgian Embassy, Spain
- 14 January: ..cole Sup rieure des Forces Arm es, France
- 10 February: Assembly of the Western European Union
- 17 February: Dr. Franz Josef Jung, Minister of Defence, Germany
- 18 February: Mr Mark Lee, Chief, Intelligence Engagements Division, and Mr. Gordon Brenner, Imagery Intelligence PoC, United States European Command (EUCOM), Stuttgart, Germany
- 11 March: EADS Astrium, Paris, France
- 11 March: Mr Akira Awasawa, Director of International Relations Department, and Kazuyuki Tasaki, Director of JAXA Paris Office, Japan Aerospace Exploration Agency (JAXA)
- 12 March: H.E. Pasquale Terracciano, Ambassador of Italy, Spain
- 12 March: H.E. Neven Pelićarić, Ambassador of Croatia, Spain
- 26 March: Mr. Rob Dukker, Defence Intelligence and Security Service, Ministry of Defence, The Netherlands
- 27 March: Mr Jacques Baute, Director of Safeguards Information Management Division, International Atomic Energy Agency, Vienna, Austria
- 30-31 March: National Geospatial Intelligence Agency, Washington, US
- 22 April: NATO CC-Land HQ, Pozuelo de Alarc n, Madrid, Spain
- 23 April: Ms Sara Anzororena, Centro para el Desarrollo Tecnol gico Industrial, and delegation from the Spanish Ministry of Defence, Madrid, Spain
- 29 April: Capt. Valter Zappellini, Joint General Staff, Roma, Italy
- 7 May: ..cole du Commissariat de l'Arm e de l'Air Fran aise, Salon de Provence, France
- 25 May: EADS/Astrium, Paris, France
- 15 June: Deputy State Secretary, Ministry of Foreign Affairs, Switzerland
- 19 June: Mr. Pieter de Crem, Minister of Defence, Belgium
- 03 July: DLR, German Aerospace Centre
- 07 July: Representatives from the Spanish Ministry of Defence
- 8 July: H lios Retex EUFOR Chad/RCA
- 13 July: Mr William Shapcott, Director, Joint Situation Centre, Brussels

- 07 September: Mr Francisco Fonseca, Head of the Representation of the European Commission in Spain
- 15 September: Wise Pen Team, European Defence Agency, Brussels
- 20 October: Mr Pedro Duque, Deimos Imaging, S.L.
- 27 October: The Army Geographic Institute, Portugal
- 10 November: Technical meeting with ESA on Space Situational Awareness
- 13 November: Lt. Col. Henrie Doreleijers, Defence Attaché, The Netherlands
- 25 November: European Defence Agency and Instituto Nacional de Técnica Aeroespacial, Spain
- 26 November: Commissariat de l'Énergie Atomique, France
- 26 November: WEU Parliamentary Assembly, Mr Robert Walter, Mr Colin Cameron, Mr José Manuel Pedregosa
- 3 December: European Parliament, Subcommittee on Security and Defence

The Director and the Deputy Director have carried out the following missions:

- 13 January: Industrieranlagen Betriebsgesellschaft GmbH, Munich, Germany
- 19 January: Crisis Room, DG RELEX, European Commission, Brussels
- 20-23 January: DGI Europe 2009, London, UK
- 26 January: Mr. Klompenhauer, Civilian Planning and Conduct Capability, Council of the EU, Brussels
- 28 January: European Space Operations Centre, ESA, Darmstadt, Germany
- 28 January: Joint General Staff, 2nd Dept., Ministry of Defence, Rome, Italy
- 29 January: Kommando Strategische Aufklärung, Gelsdorf, Germany
- 30 January: Ministry of Defence, Bonn, Germany
- 5 February: Structured Dialogue on Space, Brussels
- 6 February: Briefing to the Political and Security Committee, Brussels
- 11 February: Budapest Club Conference, Bucharest, Romania
- 23 February: Mme. Claude-France Arnould, Council General Secretariat, Brussels
- 24 February: Meetings at EU Commission, Brussels
- 4 March: Hélios Cell, OHQ Mont Valérien, France
- 10 March: Meeting with Adm. Giuffrida, Italian EUSC Board Member, and Italian representatives on Space and Security, Rome, Italy
- 13 March: High-Level Space Policy Group, Brussels
- 17 March: European Security Round Table, European Parliament, Brussels

- 19-20 March: EUSC Board Meeting and visit to ESRANGE, Swedish Space Cooperation, Kiruna, Sweden
- 23-25 March: Military Space Operations and Security 2009, London, UK
- 26 March: Meeting on Council Security Regulations, Brussels
- 20 April: Meeting with the Czech Presidency, the EU Council and the European Commission, Brussels
- 27-28 April: MilSpace 2009 Conference, Paris, France
- 6 May: Hélios Cell, Paris, France
- 8 May: Political and Security Committee, Brussels
- 11 May: DG RELEX, European Commission, Brussels
- 11-13 May: Geospatial Intelligence Middle East, Dubai, UAE
- 12 May: Meeting on MUSIS with DG E VIII and EDA, Council General Secretariat, Brussels
- 14 May: European Endeavour Exercise, Wildflecken, Germany
- 29 May: Mr. Samuel Žbogar, Slovenian Minister of Foreign Affairs, Ljubljana, Slovenia
- 2-4 June: Assembly of the Western European Union, Paris, France
- 4 June: Meeting on Governance and Data Policy of the Space Situational Awareness Initiative, EU Commission, Brussels
- 04 June: Meeting of Directors of Military Intelligence Schools, European Defence Agency, Brussels
- 8 June: DG RELEX, Brussels
- 10 June: Heads of Agencies Meeting, Brussels
- 22 June: NATO Imagery Conference, NATO Headquarters Brussels
- 26 June: Commandment Passation Ceremony, Creil, France
- 16 July: Passation Ceremony, Scuola di Aerocooperazione, Guidonia, Rome, Italy
- 24 July: Meetings at EU Council Secretariat and EU Commission, Brussels
- 24 July: Bundesnachrichtendienst, Pullach, Germany
- 29-31 August: Bled Strategic Forum, Slovenia
- 3 September: Gen. Jos Emilio Roldán Pascual, UME, Spanish Military Emergency Unit, Torrejón, Spain
- 10 September: German Ministry of Defence and Foreign Office, Berlin, Germany
- 11-13 September: IISS Global Strategic Review, Geneva, Switzerland
- 14 September: Swiss Ministry of Foreign Affairs, Bern, Switzerland
- 8-10 September: World Satellite Business Week, Paris, France

- 16 September: EU Commission, European Space Agency and European Defence Agency Workshop on Space for Security and Defence, Brussels
- 21 September: European Space Policy Institute study presentation, Brussels
- 24 September: 4th European Commission Security Symposium, Brussels
- 25 September: ATHENA Committee, Brussels
- 2 October: High-level Space Policy Group, Paris, France
- 12 October: Meeting on SAR-Lupe, German Ministry of Defence, Bonn, Germany
- 15-16 October: Conference: The Ambitions of Europe in Space, Brussels, Belgium
- 15 October: Conference: Environment, Climate Change and Security, Stockholm, Sweden
- 22-23 October: Budapest Club Conference, Rome, Italy
- 22-23 October: Annual Conference of the European Union Institute for Security Studies, Paris, France
- 26 October: Conference: Could Europe do better on pooling intelligence?, Brussels, Belgium
- 18 November: Security and Defence Day, Security and Defence Agenda, Brussels, Belgium
- 20 November: Ministry of Defence and Ministry of Foreign Affairs, Ljubljana, Slovenia
- 23 November: Czech PSC Ambassador and Czech EUSC Board Member, Brussels, Belgium
- 23 November: EU Military Staff Intelligence Directors Conclave, Brussels, Belgium
- 3-4 December: Conference: Space for Security & Defence in Europe, Paris, France
- 7-9 December: Global Space Technology Forum 2009, Abu Dhabi, United Arab Emirates
- 8-9 December: 8th Congress on European Security and Defence, Berlin, Germany
- 14 December: Athena Committee for EU NAVFOR Atalanta, Brussels, Belgium
- 6 November: GMES Advisory Council meeting on security, Brussels
- 20 November: MONUC, Council of the EU, Brussels
- 26-27 November: Intelligence Directors Conclave, Council of the EU, Brussels
- 2-4 December: WEU Assembly, Paris, France
- 10-11 December: Helios Cell, OHQ Mont Valerien, France
- 12 December: Structured Dialogue on Space, Brussels
- 16 December: Intelligence in Science, Brussels
- 16 December: Mr. Weissenberg, Director, DG Enterprise & Industry
- 16 December: Mr. Weis, Director, European Defence Agency, Brussels, Belgium

Glossary

AIS	Automatic Identification System
CFSP	Common Foreign and Security Policy
CME09	Crisis Management Exercise 2009
CPCC	Civilian Planning and Conduct Capability
CSDP	Common Security and Defence Policy
CSUI	Common Standardised User Interface
DG E VIII	Directorate-General E - External Economic Relations, Politico-Military Affairs, Defence Aspects, General Secretariat of the Council of the EU
DGI	Digital Geographic Information
DLR	Deutsches Zentrum für Luft- und Raumfahrt
DR Congo	Democratic Republic of Congo
ECMWF	European Centre for Medium-Range Weather Forecasts
EDA	European Defence Agency
ERCS	Emergency Response Core Service
ESA	European Space Agency
ESDP	European Security and Defence Policy
EU	European Union
EUCOM	United States European Command
EUFOR	European Union Force
EUMM	European Union Monitoring Mission
EUMS	European Union Military Staff
EU OPS WAN	European Union Operational Wide Area Network
EUROCONTROL	European Organisation for the Safety of Air Navigation
EUROSUR	European border surveillance system
EUSC	European Union Satellite Centre
FP7	Framework Programme 7
FRONTEX	European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union
GEOINT	Geospatial Intelligence
GIS	Geographic Information System
GMES	Global Monitoring for Environment and Security
G-MOSAIC	GMES Services for Management of Operations, Situation Awareness and Intelligence for Regional Crisis
IDP	Internally displaced person
IMINT	Imagery Intelligence

IISS	International Institute for Security Studies
LIMES	Land and Sea Integrated Monitoring for European Security
LRIT	Long-Range Identification and Tracking
MARSUR	Maritime Surveillances Project Team
MILEX 09	EU Military Exercise 2009
MONUC	United Nations Mission in the Democratic Republic of Congo
MUSIS	Multinational Satellite-based Imagery System for Surveillance, Reconnaissance and Observation
NATO	North Atlantic Treaty Organisation
NEC	Network Enable Capability
NFC	Nuclear Fuel Cycle
NGA	National Geospatial-Intelligence Agency
OECD	Organisation for Economic Co-operation and Development
OHQ	Operational Headquarters
OSCE	Organisation for Security and Co-operation in Europe
OSINT	Open Source Intelligence
PSC	Political and Security Committee
PoC	Point of Contact
RCA	Republic of Central Africa
SAFER	Services and Applications for Emergency Response
SAR	Synthetic Aperture Radar
SITCEN	EU Joint Situation Centre
SNE	Seconded National Expert
SRTM	Shuttle Radar Topography Mission
SSA	Space Situational Awareness
STANAG	NATO Standardization Agreement
TANGO	Telecommunications Advanced Network for GMES Operations
TIES	Tactical Imagery Exploitation System
UME	Unidad Militar de Emergencias
UAE	United Arab Emirates
UN	United Nations
UK	United Kingdom
US	United States of America
VSGS	Virtual Satellite Ground Segment
WEU	Western European Union

This Report is published in accordance with the Article 8 of the Council Joint Action of 21 December 2006

European Union Satellite Centre
Luxembourg: Publications Office of the European Union
2010 - 52 pp. - 20 x 21 cm
ISBN: 978-92-95034-02-0
doi: 10.2820/10353

OO-AA-10-001-EN-C
ISSN 1831-0753



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European Union Satellite Centre
E-28850 Torrejón de Ardoz
Madrid, Spain
www.eusc.europa.eu



Publications Office

ISBN 978-92-9503402-0



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