



# GMOSS

Global Monitoring for Security and Stability

## INTEGRATING RESEARCH ACTIVITIES

The network of Excellence GMOSS has been launched in March 2004 in the context of the GMES programme comprising 22 contractors from 11 European countries. The primary objective of GMOSS is to integrate the European community concerned with the use of Earth Observation for civil security applications through joint research and training activities, sharing resources and infrastructure, and exchange of expertise and staff.

Joint activities included an analysis of the potential of remote sensing data for threat analysis and early warning, the monitoring of critical infrastructure and damage assessment, monitoring of borders and the migration of people; as well as benchmarking of recent data analysis and visualisation concepts and techniques.

The GMOSS approach is research-oriented rather than operations-oriented. GMOSS addresses a wide and heterogeneous community covering academic research, service providers, user organisations, Commission services. By integrating remote sensing data analysis, social science and the analysis of key threats and risks, GMOSS contributes to the EU awareness of the security dimension of GMES.

## IRAQ, IRAN, ZIMBABWE AND KASHMIR: WHAT CAN WE LEARN FROM EARTH OBSERVATION?

The GMOSS work program has focused on joint work on 4 test cases relevant for European security or prone to natural disasters: Iraq, Iran, Kashmir, and Zimbabwe. Methodologies such as rapid mapping, specific feature extraction, image automatic interpretation, geographic information system modelling for decision support have been tested and different solutions have been compared and benchmarked. Information have been provided to representatives of the European Commission on pipeline sabotage in Iraq, nuclear facilities in Iran, land reform in Zimbabwe and damage assessment in Kashmir.

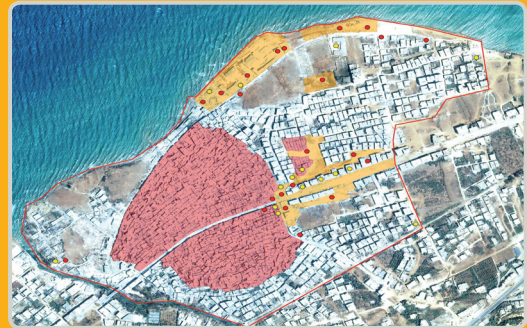
## NEAR-REAL TIME CRISIS MANAGEMENT

Two near real-time exercises have been performed evaluating the efficiency of internal collaboration and the effectiveness of tools and strategies in a realistic emergency scenario. End users and various Directorates General of the European Commission have been integrated in these exercises.

## TALKING TO USERS...

*GNEXX'07, the second near real-time exercise organized by GMOSS, focused on a crisis situation in the Eastern Mediterranean, a region suffering from inner conflict and general instability. The GMOSS network was tasked to provide detailed decision support information on the following urgent issues:*

- Damage & Situation Assessment
- Safe places, evacuation routes
- Transportation & response facilities
- Analysis and possible development of the situation



Damage assessment map of a refugee camp  
Within 3 ½ days the GMOSS teams produced the information requested by the users. It was presented to representatives from the European Commission in Brussels.

## SPREADING GMOSS EXPERTISE

The expertise of GMOSS is disseminated through summer schools and training seminars, targeting primarily young professionals in both the research and the end-user domains, such contributing to capacity building of EU and non-EU institutions. GMOSS supports the development of GMES services through its work on:

- the integration of socio-political background assessment and remote sensing methodologies
- benchmarking of data suitability and data evaluation strategies
- training and seminars
- near real-time exercises and rapid mapping.

The GMOSS proposal of possible new applications for remote sensing data analysis concerns among others the use of:

- night lights data for monitoring the impact of disasters and the movements of refugees
- low-spatial high-temporal resolution sensors for monitoring conflict-related explosions and/or fires
- automatic satellite image matching techniques for precise damage assessment of buildings
- radar and optical sensors for automatic detection of moving targets.

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## LIST OF PARTNERS

### The GMOSS Consortium

- Deutsches Zentrum für Luft und Raumfahrt e.V., DLR, Germany
- Forschungszentrum Jülich GmbH, Germany
- Technische Universität Bergakademie Freiberg, Germany
- Bundesamt für Geowissenschaften und Rohstoffe, Germany
- Department of Computer and Information Science, Linköpings Universitet, Sweden
- OD Science Application, Sweden
- FOI Swedish Defence Research Agency, Sweden
- Commissariat à l'Énergie Atomique, France
- Centre National d'Études Spatiales, France
- King's College London, UK
- QinetiQ, UK
- Centro di Ricerca Progetto San Marco, Italy
- Dipartimento di Ingegneria e Fisica dell'Ambiente - Università della Basilicata, Italy
- Joanneum Research, Austria
- University of Salzburg, Center for Geoinformatics, Austria
- Patrimony of the Royal Military Academy, RMA, Belgium
- Technical University of Denmark, Denmark
- The Netherlands Organisation for Applied Scientific Research, the Netherlands
- European Union Satellite Centre, Torrejon, Spain
- The Joint Research Centre, International Organisation
- United Nations Office for Project Services, International Organisation
- Swisspeace, Switzerland

### Associated partners

- Fachhochschule Hof, Germany
- International Institute for Geo-Information Science and Earth Observation (ITC), The Netherlands
- Institute of Methodologies for Environmental Analysis (CNR-IMAA), Italy
- Threat Analysis and Solutions (TAAS), Austria
- Centre Morris Janowitz, France
- Definiens AG, Germany
- Laboratorio di analisi e modelli per la pianificazione (LAMP), Italy
- University of Salamanca, Spain
- Technical University of Vienna, Austria
- Bonn International Centre for Conversion (BICC) Germany
- University of Pavia, Italy
- European Academy Bozen/Bolzano, EURAC, Italy
- Service Régional de Traitement d'Image et de Télédétection (SERTIT), France

## COORDINATOR

### Deutsches Zentrum für Luft und Raumfahrt e.V., DLR

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## PROJECT INFORMATION

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Network of Excellence  
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