

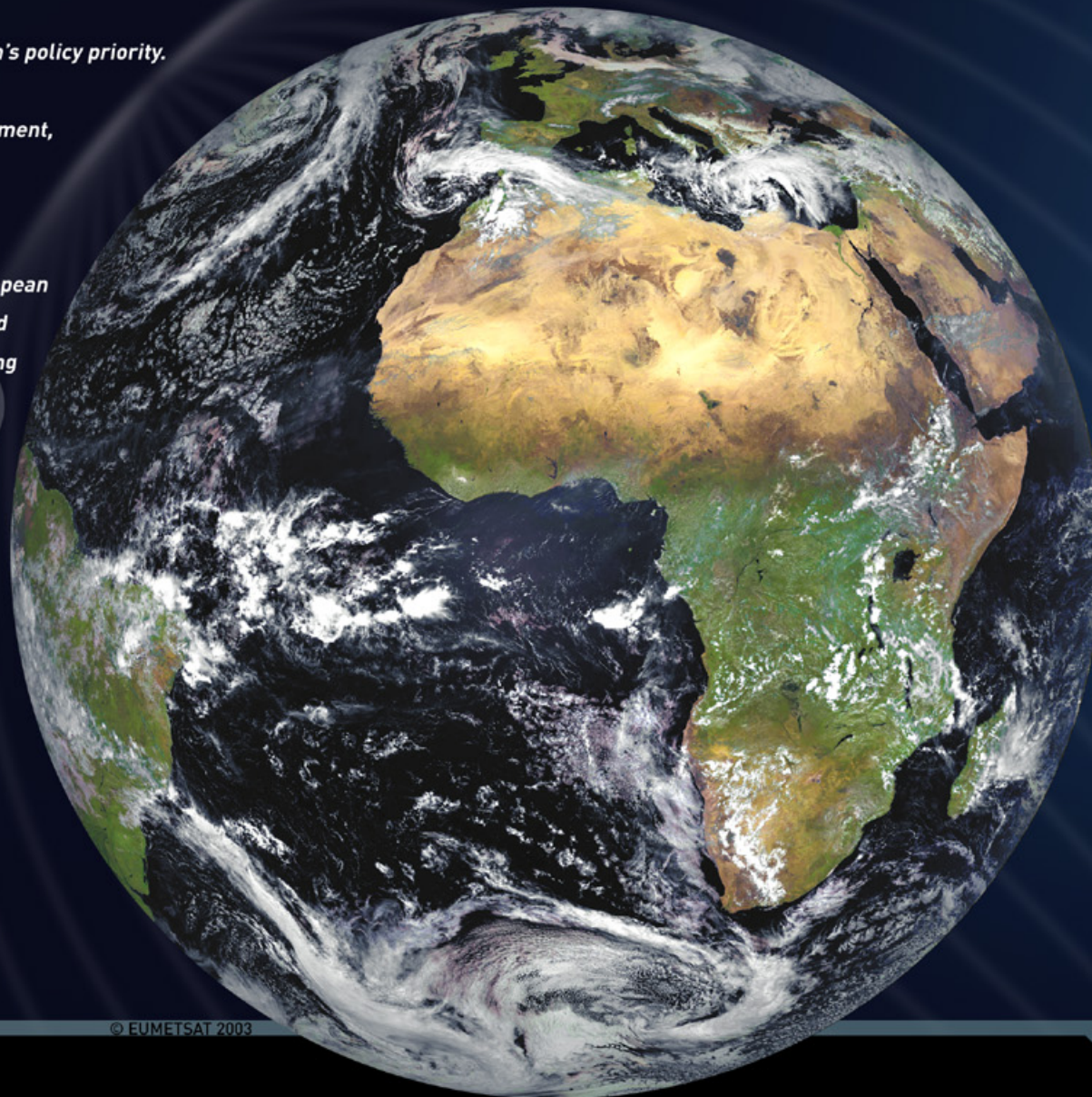
www.esa.int/gmes

MANAGING OUR PLANET

Managing our planet is a European Union's policy priority. Europe needs autonomous information to support policies in the area of environment, security and sustainable development.

Space data and space based services are an essential tool to meet such a European requirement and ESA is strongly engaged in the GMES programme and in developing its Space Component.

Jean-Jacques Dordain,
Director General ESA



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GMES (Global Monitoring for Environment and Security) is the next flagship initiative for space in Europe, after Galileo.

It was confirmed as the European Union's priority at the 2001 Summit in Gothenburg, where the Heads of State and Government requested that "the Community contribute to establishing by 2008 a European capacity for Global Monitoring for Environment and Security".

ESA is the main partner to the European Union in GMES and has contributed with programmatic activities since 2001 to the GMES endeavour. ESA has worked on the development of GMES pilot services in close conjunction with a large community of operational users. ESA is also working on multi-mission facilities and ground segment operations and is preparing the Space Component for GMES with a series of studies and preparatory activities for the development of a series of satellites missions (the sentinels) and the integration of national and European missions to guarantee continuity of data and services.

GMES is the response to the need by Europe for geo-spatial information services. It provides autonomous and independent access to information for policy-makers, particularly in relation to environment and security.

GMES represents also the European contribution to the international Global Earth Observation System of Systems, GEOSS, which was established at the third Earth Observation Summit in Brussels, in February 2005.

Volker Liebig
Director of ESA Earth Observation Programmes

LAND CRISIS RESPONSE

LAND

“Environmental protection is a key EU priority. Particular concerns include water and air pollution and climate change. We expect GMES land thematic information to provide a major monitoring component responding to these concerns.”

Jacqueline McGlade - European Environment Agency (EEA)



Forest covers more than 44% of European land mass and supports 10% of our manufacturing industry. Soil degradation affects 17% of our territory although the major cause of biodiversity loss in Europe is habitat fragmentation. Water quality remains an area of concern across Europe.



■ Forests once covered 46% of the land surface, half are now gone

Land use mapping and assessment allows more accurate assessment of nitrate and phosphate discharges into river basins to ensure the quality of our drinking water. For trans-national river basins, such integrated approaches are critical.



■ Inland water quality and contamination map

CRISIS RESPONSE

“World Food Programme works in countries where information infrastructure may not exist. GMES information is essential for logistics planning such as passable roads and functioning airstrips as well as more accurate damage analysis and assessment.”

Dr. Menghestab Haile - Food Security Early Warning Advisor (WFP)

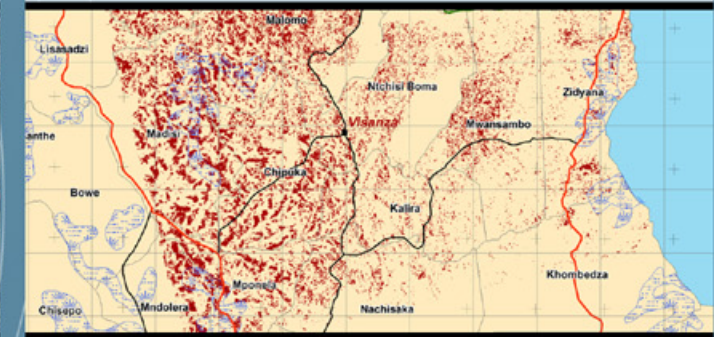


Europe is the largest provider of humanitarian assistance. To ensure an effective response, accurate information is needed on the location and extent of the disaster, plus the level and nature of aid required. Too much food aid or aid that arrives too late risks destroying local markets for food, while too little aid results in avoidable death by starvation and disease.



■ Earthquake devastation in Muzaffarabad - Pakistan

Regional and district level indications of crop cover and yield levels enable identification of potential crop failures earlier in the growing season than would otherwise be possible. This ensures a more accurate assessment of aid requirements and a more effective response.



■ Vegetation productivity indicator map using Satellite Data

MARINE & COASTAL

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“ You can say there is a war in the Baltic against illegal polluters. GMES information provides more rapid detection of illegal oil discharges to support more effective response and better protect our marine environment. ”

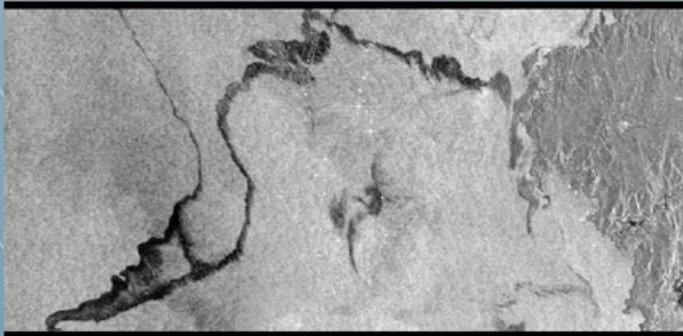
Thomas Fagö - Chairman of Helsinki Commission Response Group

Europe's marine and coastal environment is under stress from pollution and habitat deterioration. 90% of European oil imports travel by sea while eutrophication levels are increasing in many European coastal areas. For Northern Europe, Arctic ice thickness has decreased by 40% causing significant degradation to Polar habitats.



■ Oceans under pressure, impacting even the food chain

Integration of satellite imagery with vessel traffic information systems enables rapid identification of illegal pollution. Coupling satellite imagery with state of the art oceanographic models improves the accuracy in forecasting the evolution of major slicks (such as that caused by the Prestige) and ensures appropriate responses are put in place.



■ Oil spill from the Prestige tanker - Envisat

ATMOSPHERIC POLLUTION

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“ GMES local air pollution information has enabled all of our residents to see exactly where pollution levels are higher each day on a street by street basis and avoid unnecessary exposure. ”

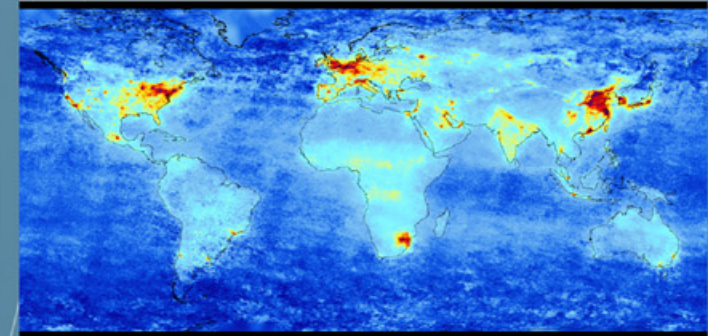
Stephen Potter - Pollution manager, London Borough of Croydon

European policies will result in a reduction of land-based air pollutants, but considerable variation will remain over the EU territory and emissions from other areas will continue to impact on our health and our ecosystems.



■ Polluted air around urban centres

Enhancing existing measurement networks with leading edge models and new satellite observations ensures that air pollution can be effectively monitored at all scales – from Global or European level right down to an individual city street.



■ Global NO2 pollution tracking - Envisat

Benefits and Impacts

GLOBAL MONITORING FOR ENVIRONMENT AND SECURITY

GMES will support Europe's strategic environmental and security priorities.

The case for implementing GMES rests on the nature and scale of the benefits to be realised.

These include strategic and political as well as economic benefits, based on more effective policy definition and implementation.

Additional cost effectiveness will come from enhanced collection and analysis of information required to support policy.

ECONOMIC BENEFITS

The total present value of benefits is estimated to be in excess of €390 Billion in the period to 2030, with one third of these benefits occurring in Europe and the rest being realised at global level.

Examples include:

€47 Billion due to reduced global deforestation

€3 Billion due to conflict resolution reducing health and welfare losses in Africa alone

€3.5 Billion within Europe through risk and civil protection applications

In addition, better informed climate change adaptation policy based on more accurate local and regional GMES-supplied information could generate benefits of more than €250 Billion.

Quantifying the Benefits

Europe a Global Player

STRATEGIC BENEFITS

Engagement with many of the world's most urgent environmental and security issues is being led by Europe.

Without GMES, Europe cannot easily organise an evidence-based response during international negotiations.

GMES guarantees Europe's strategic independence and international effectiveness.

It gives Europe the opportunity to lead the way in negotiating environment agreements and influence international policy and practice.

EFFICIENCY BENEFITS

GMES will contribute to improved cost effectiveness through common monitoring approaches, shared analysis infrastructure and more effective exchange of data.

This is expected to realise savings in excess of €130 Million per annum within Europe.

In addition, the monitoring burden on European industry would be reduced, supporting significant savings and an improved competitive position.

Common Monitoring Approaches

*The Earth was small, light blue,
and so touchingly alone,
our home that must be defended
like a holy relic.*

*Cosmonaut Alexei Leonov
First man to walk in space*

• The GMES Space Component programme is an end-to-end system which will fulfil the space-based observation requirements in response to European policy priorities - ESA is the implementing Agency of the GMES Space Component.

• The GMES Space Component includes the development of a series of satellite missions, to support data needs of users and GMES Services from 2011 onwards.

The missions will include radar and optical imaging, altimetry and atmospheric chemistry instruments for ice monitoring, coastal management, emergency management, land cover information, ocean colour and atmospheric pollution.

• The GMES Space Component will also integrate national and other international missions.