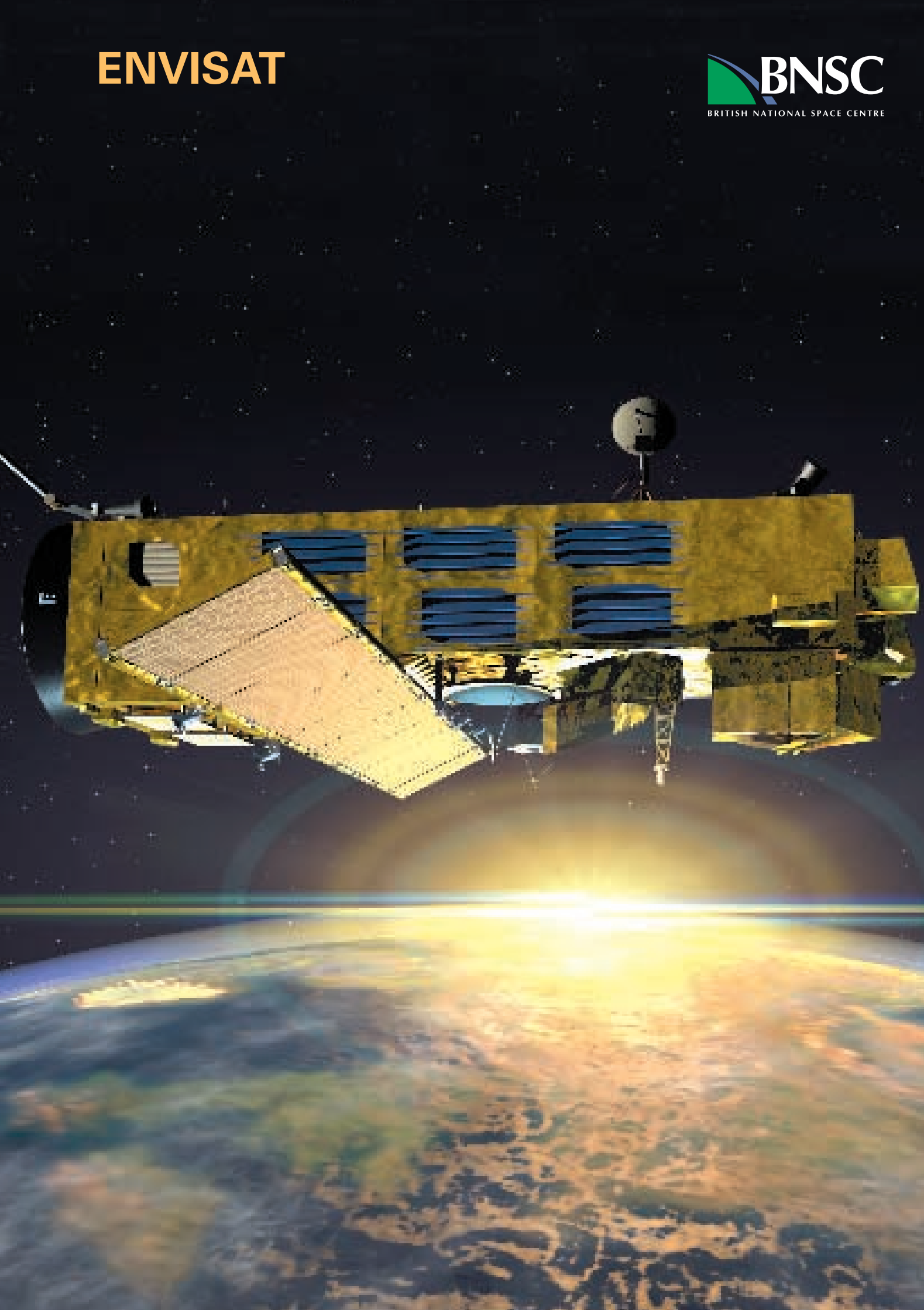
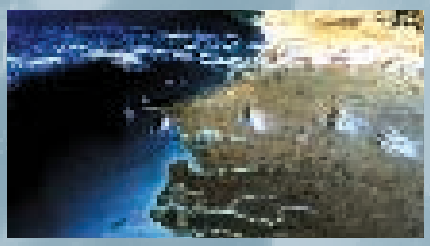
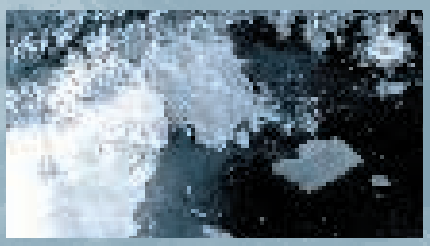
ENVISAT

BNSC
BRITISH NATIONAL SPACE CENTRE





The first image returned from the Envisat Earth observation satellite shows the coast of West Africa



ESA's CryoSat mission will focus on polar regions

Launched by ESA on February 28th 2002, Envisat is the most advanced Earth observation satellite. It will be giving our planet a thorough health check, providing us with crucial information about global warming, depletion of the ozone layer and environmental change.

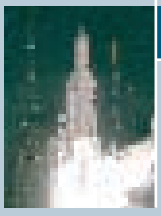
Envisat, ESA's £1.4 billion Earth observation satellite, was launched from Kourou spaceport in French Guiana on February 28th, 2002. The launch represented the culmination of years of planning by UK and European scientists and engineers, with BNSC, which steered the £300 million investment from the UK Government, playing a major role in its success.

The world's largest and most advanced Earth observation satellite, Envisat now begins its important journey to study the planet and investigate how our environment is changing. It orbits the Earth every 100 minutes, monitoring the oceans, ice caps, vegetation and the atmosphere as it goes. Envisat will be building on the vital information that has already been gathered by ESA's Earth observation satellites, ERS-1 and 2.

By the end of March 2002, Envisat had already started sending back its first images, as ESA began to test the instruments on-board and the processes used to transmit data back to Earth. Envisat's Medium Resolution Imaging Spectrometer (or MERIS), which was designed to observe ocean colour, can measure the concentration of phytoplankton and detect chlorophyll concentrations of less than 1/10,000,000 of a gram per litre.

The first MERIS observation clearly showed an extensive phytoplankton patch on the Mauritanian coast of West Africa. In this area, north-east trade winds bring deep and nutrient-rich water up to the surface, feeding phytoplankton, in a process called 'up-welling'. However, the intensity of the upwelling is affected by changes in climate, with dramatic consequences for marine ecosystems, fisheries and the local economy. It is these changes that will be continuously monitored by MERIS.

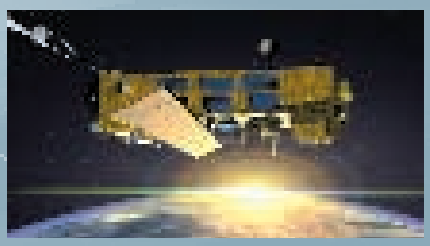
Another of the initial images returned by Envisat shows the Antarctic Peninsula, where the ice shelves can reach a thickness of 300 metres along the 1000 kilometre stretch. Envisat's Advanced Synthetic Aperture Radar (ASAR) is ideal for observing these ice shelves. The Antarctic Peninsula has experienced extensive atmospheric warming over the last 50 years, increasing in temperature by an average of 2.5°C, and is of vital interest to environmental researchers.



ENVISAT SUPPORTS GLOBAL AIMS

Envisat also represents a major step forward in Europe's objective to harmonize all the efforts of the 15 member states of the European Space Agency in the area of Earth observation, under the banner of the Global Monitoring for Environment and

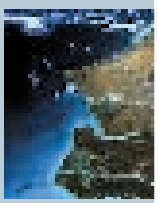
Many UK firms took part in the development of Envisat



Envisat circles the Earth every 100 minutes

Security initiative, or GMES. The GMES initiative gained a strong commitment from ESA's Ministerial Council in November 2001.

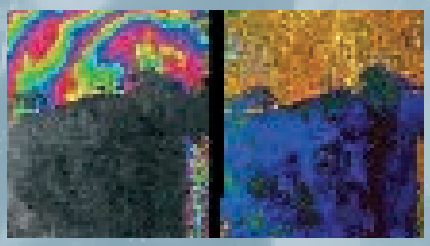
A long-term project, GMES aims to look at regional, national and local requirements for environmental information and to co-ordinate the overall space resources in order to satisfy these requirements. Through GMES, ESA will be looking at where the gaps in Earth observation information are and how they can be filled in. This is undoubtedly an international issue of importance, and it is widely believed that it is only through co-operation that we can make the best progress. A European global monitoring service for environmental monitoring and security purposes is set to come into effect by 2008.



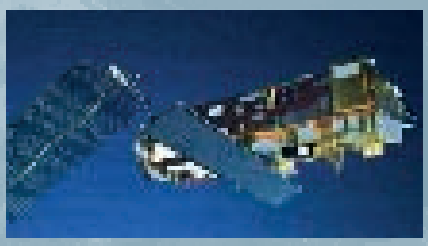
UK COMPANIES CLOSELY INVOLVED

Thirteen UK firms played key roles in the development and construction of Envisat, not to mention the many organisations that will be using the data that it produces in their own environmental applications.

- **Astrium UK** - the project's lead contractor, developed a radar to study ocean waves and a radiometer to measure sea temperatures
- **BAe Systems** - developed eight infrared detectors used to measure air temperature, pressure and trace gases in upper atmosphere
- **CODASciSys plc** - designed a simulator for testing flight procedures, on-board software updates and operator training
- **COM DEV Europe Ltd** - provided an ultra-high strength amplifier for output of infrared detectors
- **ESYS plc** - will help to bring the data to end-users
- **Infoterra** - developed the Envisat archive facility and will operate the UK Processing and Archive facility
- **Logica UK Ltd** - designed the ground segment
- **Marconi Applied Technologies** - supplied imaging components to collect data on atmospheric chemistry, the oceans and land surfaces
- **Nigel Press Associates** - will distribute Envisat data to end users
- **QinetiQ** - co-ordinating data distribution and processing, particularly of Advanced Synthetic Aperture Radar (ASAR) data
- **Rutherford Appleton Laboratory** - as well as input into the design and development of the radiometer, RAL will co-ordinate promotion to end-users
- **SIRA Electro-Optics Ltd** - delivered the electro-optical subsystems for the ozone monitoring instrument called GOMOS, which will be measuring ozone concentration changes, producing as much data as 360 ground-based stations



Envisat's instruments gather different types of environmental data



Envisat observes us from an orbit 800km above Earth

- **Vega Space Systems** - technical management support for the satellite radiometer, and also responsible for electrical integration and testing of Envisat's payload

Among those who will use data produced by Envisat are the Natural Environment Research Council's Centres of Excellence. These are:

- **Data Assimilation Research Centre (DARC)**
  Using data assimilation techniques based on satellite data for issues as varied as weather prediction, pollution transport modelling and flood control.
- **Centre for the Observation and Modelling of Earthquakes and Tectonics (COMET)**
  Satellite observations provide the opportunity to determine the accumulation and release of crustal strain and to reveal the effects of past earthquakes and faulting. In conjunction with theoretical analysis this can be used to study earthquake cycles and to quantify seismic hazard.
- **Environmental Systems Science Centre (ESSC)**
  Using Earth observation satellite data to improve our understanding of the environment and help alleviate extreme natural events.
- **Centre for Polar Observation and Modelling (CPOM)**
  Studying processes in the Earth's polar regions affecting the planet's capacity to reflect radiation, as well as understanding climate change issues, such as rising of global sea levels and the permanence of polar ice sheets and caps and how it affects Britain's climate.
- **Centre for Terrestrial Carbon Dynamics (CTCD)**
  Understanding the role of terrestrial ecosystems, forming a critical component in the release and storage of carbon dioxide - the dominant greenhouse gas - in the carbon cycle.

For more information on the Envisat satellite, contact Alice Bunn at BNSC.
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