

# The Future ESA Earth-Observation Strategy and 'Living Planet' Programme

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## Earth observation in Europe

The 'Living Planet' programme sits firmly within the overall ESA programme, contributing strongly to each of its four primary axes:

- the pursuit of scientific knowledge
- dedication to enhancement of the quality of life
- an independent capability for Europe as the key to cooperation
- promotion of a European industry based on innovation and added-value services

as given in the ESA Director General's proposal for the next ESA Council Meeting at Ministerial Level.

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**Our space capabilities are continually evolving and must be at the service of mankind both for research and for new applications. As an integral element of the Director General's proposal for a European Space Strategy, the ESA Earth Observation Strategy is an essential contribution to allow Europe to face up to the environmental, economic and political challenges of the next century. For a budget 25% less than the current annual expenditure, the 'Living Planet' programme provides the scale and the continuity for Europe to mount a broad and effective programme. It will enable Europe, its researchers and its industry to advance the use of space for obtaining critical information in many fields, such as environmental and climate change, resource and disaster management, sea, air and land transport, regional and development policies, and support to Developing Countries.**

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Europe began to establish its position in Earth Observation (EO) in the 1970s, both through ESRO/ESA initiatives (initially with Meteosat) and via national programmes (most notably, through the French SPOT programme). It has developed strong EO capabilities since, and through programmes like ERS-1 and ERS-2, Envisat and the Meteosat series, as well as other national programmes, Europe has become a front-line player in Earth Observation.

However, Europe's position at the forefront of EO science and technology, the competitiveness of European EO industry, its presence in growing

global markets and the related highly qualified employment are now in serious jeopardy. Apart from cooperative activities with Eumetsat (the European Organisation for the Exploitation of Meteorological Satellites), the present Agency EO programme has no planned space mission beyond Envisat, which is planned to be launched in 1999.

In recent months, the Agency has interrogated the major players in European Earth Observation, the Member State Delegations, Europe-wide entities like the European Commission (EC), Eumetsat, the Western European Union, and the European Environmental Agency. Both industry and the scientific community have given their inputs on what should be the future approach. The overall consensus is that the days of pure technical demonstration are over: Europe has already proved its capabilities. However, Europe's global position is also under threat.

For Europe, there are three fundamental objectives for Earth Observation:

- developing our knowledge of the Earth
- preserving the Earth and its environment
- managing life on Earth in a more efficient way.

To achieve these objectives new approaches are now needed: new ways of working, new user-orientated technical solutions, and new procedures for rapid implementation.

Decisions critical to the future of our independence in terms of industrial, research and policy-making capabilities need to be taken now. Industry has emphasised the need for immediate action. It finds itself in a very competitive situation, in a global market destabilised by newly released technology following the end of the Cold War. Furthermore, major initiatives in the USA in particular, where public money is underwriting both technical and market risk, threaten Europe's ability to

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compete and there is a real risk of Europe becoming a captive market for products developed elsewhere. As we enter a new century in which increasingly there will be needs to manage the environment more effectively, to monitor resources efficiently, and to understand evolving climate conditions, Europe must react effectively to maintain its skills and independent sources of information.

The 'Living Planet' programme is the response to the challenges posed. It combines an Earth Observation Envelope Programme (EOEP) and dedicated optional Earth Watch applications missions, as we describe below. Research and applications are combined in a programme whose implementation approaches are tuned to the new user-driven requirements.

## The origin of the new ESA Earth Observation Strategy

In Toulouse in 1995, the ESA Council of Ministers had already set a course for a European Earth-Observation Strategy, endorsing a 'Proposal for a European Policy for Earth Observation from Space' put forward jointly by ESA, the European Commission (EC) and Eumetsat.

Objectives were set for Europe in Earth Observation at that time: developing our knowledge of the Earth, preserving the Earth and its environment, and managing life on Earth in a more efficient way. But the meeting also set conditions. Any European Earth Observation programme must seek to satisfy user needs on a permanent basis. It should stimulate industrial profitability and competitiveness by promoting the widest possible market (including military). It should achieve strategic objectives, ensuring guaranteed access to data essential to the security of Europe and to the preservation of its environment. The aims and conditions set in Toulouse have been incorporated into the Living Planet approach and are subsumed in the three basic objectives given earlier in the introduction.

The principle of two types of Earth Observation missions was also adopted in Toulouse:

- **Earth Explorer:** research/demonstration missions to advance the understanding of the different Earth system processes, including the demonstration of new observation techniques
- **Earth Watch:** prototype operational



missions serving the operational applications-oriented needs of the market.

Further guidance was provided by the ESA Council at Ministerial Level in Paris in March 1997, where it was agreed that two overall principles should guide the review of the Agency's mission and strategy. These are:

- a scientific and technological policy fostering the improvement of human knowledge, innovation, quality of life and economic development in a cost-effective manner
- an industrial policy aimed at improving the worldwide competitiveness of European firms.

In order to respond to these challenging guidelines, an ESA Earth Observation Strategy Task Force was established in April 1997, which completed its work in early 1998 and outlined an ESA Strategy for Earth Observation. This Task Force was chaired by ESA's Director of Scientific Programmes (R. Bonnet) and comprised representatives of the European Commission (C. Paternmann, M. Paillon) and Eumetsat (T. Mohr, D. Williams), the chairmen of, respectively, PB-EO (S. Briggs), EARSC (C. Borg) and ESAC (G. Megie), as well as a senior consultant (R. Gibson).

The Task Force was supported by an ESA Ad Hoc Industrial Working Group (see also 'Report of the ESA Ad Hoc Industrial Working Group on Earth Observation', 28 November 1997, prepared by Eurospace), a wide consultation of European and Canadian industry (undertaken by Eurospace), and by an industrial workshop held at ESTEC in October 1997. The Task Force also made use of the work of the Earth Sciences Advisory Committee (ESAC), which developed 'The Earth Explorer Document'. A further document, 'ESA Strategy for Earth Observation', builds on the tri-lateral coordination and co-operation between ESA, the European Commission and Eumetsat, which has been further strengthened since the Toulouse Ministerial Council Meeting, and on the strong support for action voiced by the European Parliament in January 1998.

In summary, the key elements of the new ESA Strategy for Earth Observation are:

- a user-driven approach through improved communication with users, better response to scientific and market requirements, and improved exploitation of Europe's scientific and technological capabilities for research and applications

