

Luxembourg and Croatia prepare to join EUMETSAT

EUMETSAT looks set to expand once again as Luxembourg and Croatia took major steps towards becoming the next Member and Cooperating States respectively, following official signings in July this year.

Luxembourg Minister for Foreign Affairs and Commerce, Lydie Polfer, signed the Agreement with Dr. Tillmann Mohr at Ministry headquarters on 4 July 2001, and two days before, the Director-General was in Zagreb to participate in the signing with Dr. Hrvoje Kraljević, the Croatian Minister of Science and Technology. Both Agreements have to be ratified by the countries' respective governments before full accession to EUMETSAT takes place, but this is expected to be achieved before the end of this year.

As EUMETSAT's 18th Member State, Luxembourg will have full voting rights in the Council and benefit from access to all EUMETSAT services. It will contribute to EUMETSAT funding according to a scale based upon Gross National Income.



Luxembourg, 4 July 2001, Dr. Tillmann Mohr signs the Accession Agreement with Mme Lydie Polfer, Minister for Foreign Affairs and Commerce, in the presence of Dr. Henri Malcorps, Chairman of the EUMETSAT Council

Croatia will become the next Cooperating State and will have the same rights and obligations for access and use of EUMETSAT data and services as a full Member State, but with a financial contribution amounting to 50% of the full membership fee. As a Cooperating State, Croatia may not participate in EUMETSAT's decision-making, contract bidding or staff recruitment but the opportunity exists for full membership at a later date.

The Luxembourg and Croatian National Meteorological Services are already making increasing use of Meteosat and other satellite data in their operational forecasting activities and research programmes. In addition to the financial contributions to the EUMETSAT budget, the increased interaction from the new States on training and the evolving use of satellite data will stimulate new ideas, benefiting the wider EUMETSAT user community.



Zagreb, 2 July 2001, Dr. Tillmann Mohr signs the Accession Agreement with Dr. Hrvoje Kraljević, Minister of Science and Technology

index page

Membership status discussed in Bratislava 2

User Forum highlights status transition



Worldwide access to virtual training 3

Education project to provide online material

EUMETSAT's first optional programme 4

Proposal for altimetry data on an operational basis



MSG prepares for launch 6

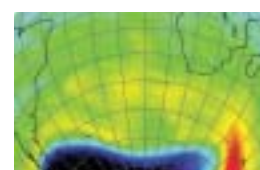
Removed from storage for intensive testing

Profile: Peter Hirschfeldt 7

Head of the Finance Division

Ozone experts present processing plans 7

SAF workshop on satellite ozone measurements



Global satellite update 8

Latest launch and technical information

PUMA gets ready to run

Project management and expertise have been secured for the Preparation for Use of MSG in Africa (PUMA), thanks to a contract awarded to the French company ACRI S.A. at the beginning of October, marking the kick-off for the 11 million Euro project.

Based in Sophia-Antipolis, the company will recruit experts to manage the procurement and installation of MSG workstations, user training and future activities. The PUMA project will provide reception equipment and training on the use of MSG data for all African countries and Indian Ocean islands, as well as four African regional training centres.

In addition to the new contract, the invitation to tender for the procurement of MSG workstations is planned for issue in the Official Journal of the European Communities towards the end of November.

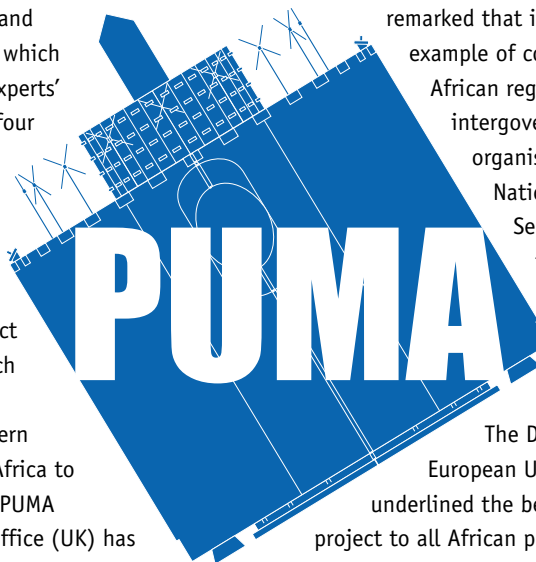
Dr. Joseph Mukabana, Director of the Kenya

Meteorological Department, is the Delegated Regional Authorising Officer for PUMA. His department is providing logistical support and offices in Nairobi, which will be the ACRI experts' base for the next four years. The World Meteorological Organization (WMO) has established a trust fund to collect contributions which will enable the countries in northern Africa and South Africa to participate in the PUMA project. The Met Office (UK) has recently indicated that it will significantly contribute to this trust fund

during 2002–2004.

The Kenyan Minister of Transport, while being briefed in July on the PUMA project, remarked that it was an excellent example of cooperation between African regional intergovernmental organisations, African National Meteorological Services and international organisations (EUMETSAT, European Commission, WMO).

The Delegate of the European Union in Kenya underlined the benefits of the PUMA project to all African populations and affirmed the Union's commitment to its successful implementation.



Membership status discussed in Bratislava

The transition from Cooperating State status to full EUMETSAT membership plus joint procurement of MSG reception equipment were topics in the spotlight at a User Forum in the Slovak Republic on 29–31 August 2001. Strengthening the links between EUMETSAT

and the user communities of central and eastern European countries attending was the objective of the forum, which was hosted by the Slovak Hydrometeorological Institute. This was the fourth in the series of EUMETSAT forums for meteorological and hydrological services of central and eastern European countries, and was held in the capital city of Bratislava.

In addition there were detailed presentations on Satellite Application Facilities (SAF), current and future EUMETSAT activities and the possibilities for future

cooperation and access to data.

The forum was attended by 29 participants, including 11 Directors of National Hydrometeorological Services and Mr. Michel Jarraud, Deputy Secretary-General of the World Meteorological Organization.

The Croatian Meteorological and Hydrological Service has offered to host the Fifth EUMETSAT Central and Eastern European Forum in 2003. The circle of invitees will be extended eastwards to include representatives of Byelorussia, Moldavia and Ukraine.

image

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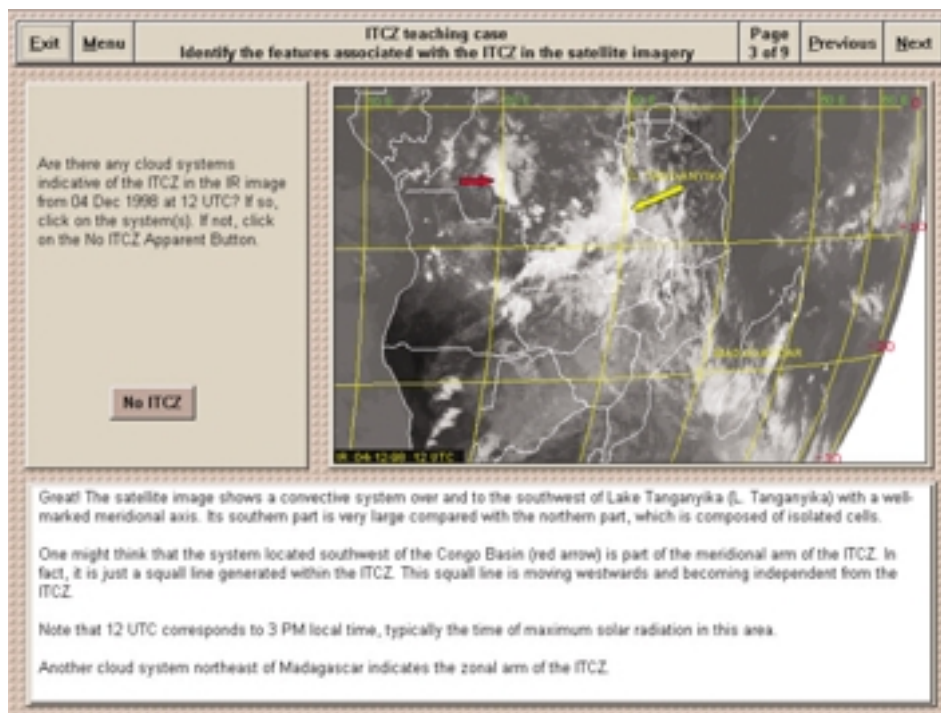
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Participants of the Central and Eastern European Forum in Bratislava, 29–31 August 2001



An example of a display seen by students using the ASMET III CAL modules

Worldwide access to virtual training

Students will soon have worldwide online access to a host of training material via a Web-based portal, thanks to an innovative new project driven by EUMETSAT. The training material will either be installed on so-called Virtual Training Laboratory servers or will be accessible via onward links to wherever it is hosted.

The development of two prototype servers is now under way at EUMETSAT and the Australian Bureau of Meteorology, and eventually it is foreseen that centres of excellence in satellite meteorology training at the Regional Meteorological Training Centres of the World Meteorological Organization will take over hosting and maintaining the system.

EUMETSAT is also concentrating on four Computer Aided Learning (CAL) projects, as well as working on the training material distribution infrastructure.

A contract has been placed with the companies Intrallect and Adalink to develop three CAL modules on Meteosat Second Generation. Included in this project will be the tools necessary for the modules to be maintained and updated and for further modules to be added. These first modules, due to be delivered in mid-2002, will be made

available via the EUMETSAT website and the virtual learning infrastructure.

Following the great success of the so-called SATREP modules developed for EUMETSAT by a consortium involving the National Meteorological Services of Austria, the Netherlands and Finland, a further set of training material based on conceptual modules and case studies is currently being developed by the same partners. This project, known as SATMANU, will enhance this widely-used resource.

In 1998 the award-winning EuroMET CAL material was developed and has since been extensively used in many training environments. A project to assure the future maintenance and development of the resource, now renamed EUMETCAL, has been initiated by EUMETNET* with EUMETSAT as a contributing partner.

The development of CAL modules for use in Africa is now largely under the control of trained African experts with EUMETSAT playing a supporting and coordinating role. The latest results from this project are the ASMET III modules which should be ready for use in classrooms in Africa in the near future.

*The Network of European Meteorological Services



Director-General's Desk

Worldwide cooperation between meteorologists is vital in an environment where weather systems disregard national boundaries and political divides. With severe weather events so often in the news, the climate and its changes need to be monitored on a global scale, and future trends have implications for us all.

A primary aim of organisations such as EUMETSAT is the provision of observational data from space, improving predictions of dangerous phenomena and the potential for climatic changes. The land, the oceans and the atmosphere all interact to influence weather systems and the global climate. Against this background worldwide cooperation between the scientific communities has increased, promising significant future benefits.

Since our modified Convention came into force in November last year, our remit has been widened to cover operational monitoring of the climate and the detection of global climatic changes as well as meteorological observation from space. On 27 September 2001 we held the first potential participants' meeting for an optional programme on altimetry, a significant step towards operational monitoring of the oceans from space.

Our distributed ground processing facilities also play a significant role in the harnessing of related scientific expertise. These Satellite Application Facilities (SAF) use specialised expertise to develop new products and processing algorithms for satellite data. The seven facilities already well under way will help the monitoring of climate change, ozone concentrations, land surface and ocean conditions as well as providing benefits to meteorology.

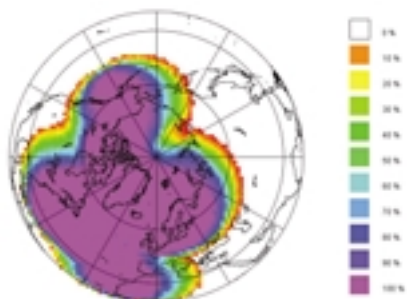
Looking to the future of satellite meteorology, a meeting was held in Darmstadt on 13-15 November 2001 to consult the user community of our Member States on their requirements for geostationary observing systems to follow Meteosat Second Generation. This demonstrated that the cooperation is well founded and has a long future.



Fast access to satellite data for Europe

European satellite users will soon be reaping the benefits of a new service that provides high-speed, cost-efficient information on temperature and humidity in the atmosphere.

The aims of the agreement, made by the EUMETSAT Council in June 2001, are to provide up-to-date polar orbiting sounder data covering data-sparse sea areas around Europe, with a timeliness suited to the needs of European operational short-range regional numerical weather prediction models.



Initial geographical coverage of the data collected by the EUMETSAT ATOVS Retransmission Service

The retransmission service will use data from a set of instruments called ATOVS (Advanced TIROS Operational Vertical Sounder) on the satellites operated by NOAA (the USA's National Oceanic and Atmospheric Administration). The service will provide information on the vertical profiles of temperature and humidity, which is vital to the performance of all numerical forecasting model systems. Advanced techniques developed for operational use over the last ten years will assimilate the radiation measurements from the ATOVS instruments in numerical atmospheric models.

The EUMETSAT ATOVS Retransmission Service will mean improvements to the existing methods of reception, by combining increased geographical coverage with timely transmission.

End-users in the European region will receive data within 30 minutes of the collected instrument measurement, thanks to a network which will be established between existing High Resolution Picture Transmission receivers. Reception of data soon after transmission from the NOAA satellites only requires an 80 cm antenna dish and a standard PC equipped with a digital video broadcast card.

Altimetry as EUMETSAT

Plans to establish EUMETSAT's first optional programme through involvement in the follow-on satellite to the Topex/Poseidon and Jason-1 altimetry programmes have been discussed, with the objective of EUMETSAT becoming the European operational partner alongside CNES (France), NOAA and NASA (USA).

Delegations from 11 Member States attended the first meeting of Potential Participants in the EUMETSAT Optional Jason-2 Altimetry Programme, in Darmstadt on 27-28 September 2001. They were able to agree a draft programme proposal and draft Declaration that will be put to the EUMETSAT Council in December 2001.

The need for the continuation of precise non-sun-synchronous orbit altimetry data has been clearly expressed by the ocean user community. In particular, this has been in the form of the requirements of the Global Ocean Data Assimilation Experiment (GODAE), the Integrated Global Observing Strategy

Partnership (IGOS-P) and the European Global Ocean Observing System (EuroGOOS).

The primary objective of the programme will be to ensure that the EUMETSAT user community continues to receive altimetry data on an operational basis, with the unique accuracy, continuity and coverage of the Topex/Poseidon and Jason-1 missions. The data will support operational activities in marine meteorology, seasonal forecasting and oceanographic services. It will also support the monitoring of the climate through its contribution to the description and understanding of the ocean circulation and its variability on all scales.

The main EUMETSAT involvement will be in the reception and distribution of data, in particular real-time wind/wave observations with an accuracy better than two metres per second and with an orbit accuracy better than 50 cm and a range accuracy better than 4.5 cm. Within five hours, 95% of the data recorded

Rapid Scanning Service goes

Weather presentations, nowcasting, training and research applications are all set to benefit from image sequences provided by the new operational Rapid Scanning Service (RSS) introduced by EUMETSAT on 18 September 2001.

As with the rapid scan imaging support provided to the Mesoscale Alpine Programme in Autumn 1999, the new service will utilise the stand-by Meteosat spacecraft at 9°W (Meteosat-6) and redundant ground segment equipment. This is an excellent source of information and the service is expected to continue until at least the end of 2003.

The baseline for the RSS is ten-minute scans covering the approximate latitude range of 15-65°N (see figure). These rapid scans are geometrically corrected in near real-time. In parallel to this, the infrared and

water vapour images are corrected for the effects of the Meteosat-6 radiometric anomaly by cross-calibrating them with Meteosat-7 images. Each corrected and calibrated rapid scan image will be made available to registered users via the Internet within ten minutes of the end of the scan.

As part of the new service, the EUMETSAT Meteorological Products Extraction Facility produces a set of wind products derived from the rapid scan image data. These wind products are disseminated via the Global

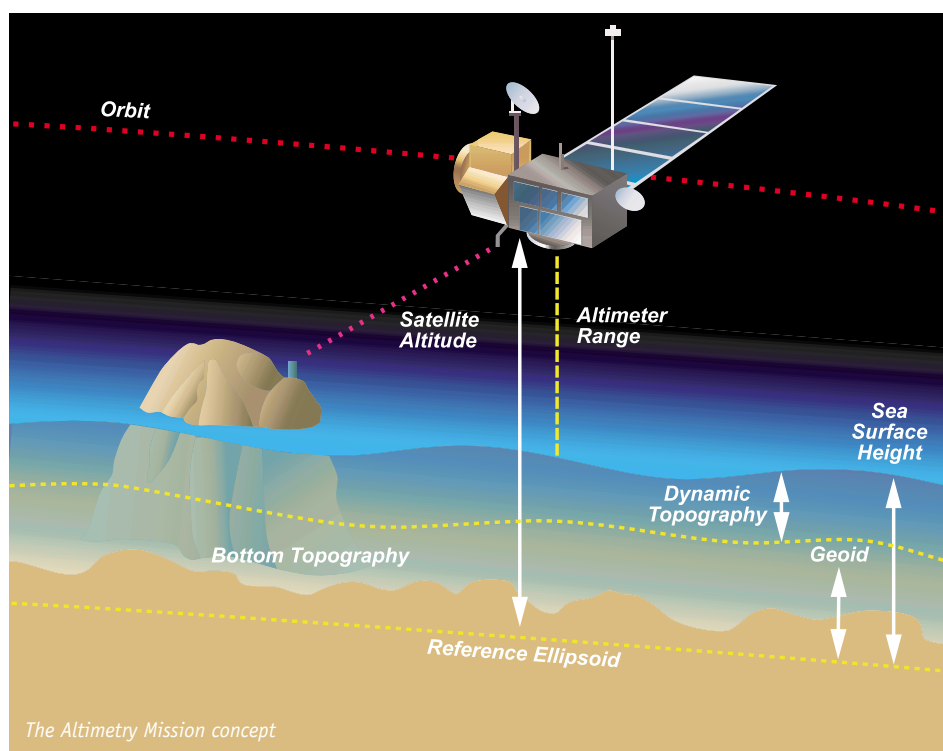


SAT's first optional programme

will be available. Higher precision products, based on improved understanding of the actual orbit restitution, will be available on a three and a 30-day basis, and all data will be archived.

The programme is also an important element in the overall altimetry data system. In addition to the precise non-sun-synchronous altimetry data from Topex/Poseidon and Jason, ESA's ERS/Envisat satellites will provide high-inclination sun-synchronous data. Merging the data from these two systems provides maximum synergy for applications such as ocean mesoscale circulation. The long-term objective beyond 2010 is to have a single global altimetry system, supported by at least Europe and the USA, covering both the non-sun-synchronous and the sun-synchronous orbits.

Further details of Jason and Topex/Poseidon can be seen at: www.cnes.fr and topex-www.jpl.nasa.gov.



es operational

Telecommunication System of the World Meteorological Organization.

The RSS anticipates rapid scan imaging being performed every day of the week. However, it will be necessary to interrupt rapid scan imaging for a period of 12 hours every three days to perform the full Earth disc imaging needed to stabilise the image processing system. The RSS will also be interrupted for about three days every month for spacecraft orbit determination activities.

More information on the RSS and how to register for it can be found on the EUMETSAT website at www.eumetsat.de/en/dps/dissemination/rss.html.

The area covered by the Rapid Scanning Service (15-65°N)

MSG prepares for launch

The first Meteosat Second Generation (MSG-1) satellite has been removed from storage. During the eight months in storage at the Alcatel facility in Cannes on the Mediterranean coast of France, MSG-1 underwent activities to improve performance in potential risk areas. These activities have been conducted in line with planning agreed at the flight acceptance and pre-storage reviews, and intensive testing is now being conducted on the satellite to ensure that it will be fit for launching next year.

The current plans are to launch the satellite on an Ariane-4 in Summer 2002 from Kourou in French Guiana. Readers of previous editions of IMAGE will recall that the shock levels imposed by the first version of Ariane-5 were too high for MSG and so the well-tried Ariane-4 launcher has been selected until the compatibility is achieved.

Following the problem encountered on Ariane-5 flight 142, there remain some uncertainties about the availability of an Ariane-4 launch vehicle due to the backlog of Ariane-5 clients. Preparatory launch activities are currently being

conducted in parallel for a launch on the later version of the Ariane-5 that has lower shock levels.

The availability of a 'co-passenger' satellite has also to match that of MSG for the schedule to work, and this aspect is under evaluation at Arianespace.

After evaluation of the readiness status and residual development risks at overall programme level, the decision to take the satellite out of storage was made in coordination with ESA. Significant progress has been made in the most critical areas and EUMETSAT is pushing hard for the launch preparation and the readiness for operations to ensure that users do not experience further delays to the provision of MSG data. A July time-frame would be extremely favourable for optimising the orbit life of the satellite.

Whilst MSG-1 was in storage, the integration and test activities of MSG-2 continued, and it will now be kept in storage until after the launch of MSG-1.

From the archive

Both the ocean and atmosphere are fluids, in constant motion. The phenomenon that is shown in the Meteosat-7 visible channel image of the Canary Islands at 10.00h UTC on 4 April 2001 is a vortex street, a linear chain of spiral eddies called von Karman vortices. This manifestation is named after Theodore von Karman (1881-1963, co-founder of NASA's Jet Propulsion Laboratory) who first described the phenomenon in the atmosphere.

Von Karman vortex streets form at all scales of fluid motion. They consist of two roughly parallel rows of vortices such that a

vortex in one row is situated across the mid-point of the two adjacent vortices in the other row. In the beginning, the vortices are comparable in diameter to the size of the island. As they move downstream they tend to increase in diameter and may persist to form a wake 100 km wide and several hundred kilometres long. A pair of vortices is shed by the island about once every eight hours and may last as long as 30 hours. All the vortices in one row have similar circulation, but in a sense opposite to that in the other row.



Meteosat-7 visible channel image, 10.00h UTC, 4 April 2001



Benefits for EUMETSAT and the European Meteorological Society

EUMETSAT's associate membership of the European Meteorological Society (EMS) has provided opportunities and a range of benefits to both organisations. EUMETSAT contributes satellite meteorology expertise, as well as support in the areas of publications and conferences. In turn, the EMS provides EUMETSAT with the opportunity to be in contact with representatives of many of its Member States and meteorological societies currently outside our membership area.

The EMS is an association of 25 meteorological societies – or related societies – from 22 European countries, and the aim is to achieve common meteorological goals in Europe which cannot be achieved by its members alone. EMS members include societies and organisations, but not individual persons.

A new type of membership was introduced by the EMS General Assembly on 11 July 2000, which made Associate Members active on a European level and with mutual interests. Associate Members – which are organisations, bodies and companies – attend the EMS Council and its annual meetings as observers.

The EMS is currently in the process of founding committees on accreditation, education, publications, conferences and media. The first EMS annual meeting was held in conjunction with the European Conference on Applications of Meteorology (ECAM), on 24-28 September 2001 in Budapest, Hungary.

Further details of the EMS can be found at the following Web address: www.emetsoc.org.

image profile

Peter Hirschfeldt

Head of Finance

Organisation, and Peter's aim is to provide fast, real-time access to relevant financial information for all managers and staff.

Before joining EUMETSAT, Peter worked abroad for 20 years in various international organisations, mostly in the finance domain, where he automated several systems. Peter hopes to ensure financial consistency within EUMETSAT by creating an informative and comprehensive overall picture from the mosaic of information and real-time financial data.

After graduating from Darmstadt University in computer science and tax law, Peter left Germany to head for the USA where he completed his postgraduate studies in computer science.

His student days in Darmstadt obviously held some attraction because he readily accepted EUMETSAT's invitation to return, not to a carefree student environment but to a much more demanding regime.

Peter plans to build upon the current sound financial systems used by EUMETSAT to support additional requirements such as analytical accounting and more automated monitoring algorithms. The biggest beneficiaries of the new integrated financial system will be the operational staff and managers responsible for contracts, as well as those authorising expenses and monitoring project performance against plans.

By combining the different visions and possible solutions that exist, Peter hopes to implement an efficient system appropriate to the current and future needs of EUMETSAT. After nearly a year in the Organisation, Peter says that he has the support of an excellent team and is very pleased to have joined EUMETSAT.

When time allows, Peter is a keen sailor, plays bridge and likes ballroom dancing and playing an occasional round of golf.



Peter Hirschfeldt

Equipped with a wealth of experience and a vision for change, Peter Hirschfeldt joined EUMETSAT as the Head of the Finance Division in January this year. He is undaunted by his assigned task of introducing a state-of-the-art integrated financial system throughout the whole

Ozone experts present processing plans

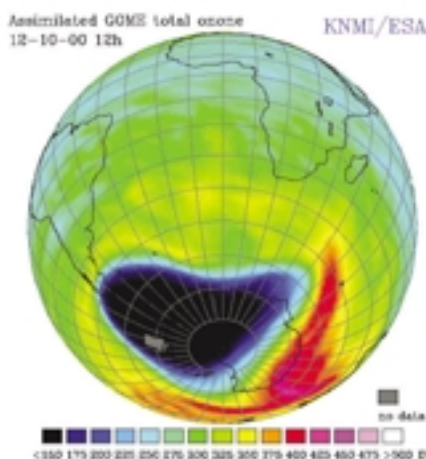
Satellite measurements, ozone monitoring and ultraviolet (UV) radiation observation were the focus of a EUMETSAT workshop in Greece on 21-23 May 2001.

The workshop, held in Halkidiki on the Aegean coast, was organised between EUMETSAT and a consortium of ten partner organisations that form the Satellite Application Facility (SAF) on Ozone Monitoring.

Led by the Finnish Meteorological Institute (FMI) based in Helsinki, Finland, the consortium includes two institutions from the workshop hosting country, Greece: the Aristotle University of Thessaloniki and the Hellenic National Meteorological Service.

A severe loss of stratospheric ozone in the high latitudes of the Northern Hemisphere as well as over the Antarctic has been detected over recent years, so the work of the SAF is particularly timely. Intensification of UV radiation which is known to be dangerous to humans as well as affecting agriculture, forests and water ecosystems, has also been observed.

EUMETSAT's Director-General opened the workshop, which included over 40 presentations dedicated to existing and planned satellite instruments related to ozone and trace gases, UV and aerosol products and operational data validation.



Petteri Taalas of the FMI provided an overview of the Ozone Monitoring SAF products and activities. He observed that a

major outstanding task concerns validation activities dedicated to assessments of data quality and in support of trend analysis using satellite and ground-based observations.

Peer Hechler of the German Weather Service described the connections between ozone monitoring activities and the Climate Monitoring SAF. Further links to research activities supported by the European Commission were summarised by Georgios Amantidis. The World Meteorological Organization is coordinating the validation activities based on the widely-agreed strategy for integrating satellite and ground-based observations of ozone.

A keynote presentation from Prof. Dr. John Burrows of the University of Bremen stressed the need for space-borne ozone and trace gas measurements in atmospheric research. In order to reinforce scientific goals, the SAF is expected to develop a comprehensive validation plan for the future of its products. Further information on EUMETSAT SAFs may be found at www.eumetsat.de/saf.

Annual EUMETSAT conference in Antalya

The EUMETSAT annual users' conference was held in Antalya on the Mediterranean coast of Turkey on 1-5 October 2001 and was host to 177 participants from 34 countries. Prof. Dr. Atilla Dorum, Director-General of the Turkish State Meteorological Service, opened the conference followed by a welcome speech from the EUMETSAT Director-General.

The conference programme was organised in six sessions:

- current and future satellite systems;
- ocean monitoring;
- observations of the atmosphere;
- precipitation;
- global monitoring: products and applications;
- operational applications.

During the week, within these six categories, 52 verbal presentations, 37 poster displays and seven software demonstrations took place. Proceedings of the conference will be published in December and will also be available on the EUMETSAT website.

Plans for the 2002 EUMETSAT users' conference are well under way. It will be held in September in the conference centre of Dublin Castle, Ireland.



Participants of the EUMETSAT users' conference in Antalya, 1-5 October 2001

Global satellite update

Europe: *Meteosat-7 supports the primary service at 0° Longitude. The Rapid Scanning Service from Meteosat-6 (back-up at 9°W) became operational on 18 September 2001. Meteosat-5 at 63°E continues the Indian Ocean Data Coverage service. MSG-1 is planned for launch in Summer 2002 and Metop-1 in late 2005.*

USA: *GOES-10 (West) at 135°W and GOES-8 (East) at 75°W continue to function with no significant changes. GOES-11 is stationed at 105°W as back-up. GOES-12 (launched in July 2001) will be placed into in-orbit storage in December 2001 after post-launch checkout. NOAA-15 is the primary morning polar satellite with NOAA-12 as back-up. NOAA-15 is experiencing HIRS and AVHRR instrument difficulties, and three high-gain downlink antennas have failed. NOAA-16 (launched in September 2000) has replaced NOAA-14 as the primary spacecraft in the afternoon orbit. The HRPT downlink on NOAA-16 was moved to 1695 MHz following degradation of the high-frequency 1707 MHz transmitter, but the VHF transmitter failure in November 2000 affects the APT broadcast. NOAA-M is tentatively scheduled for launch in March 2002.*

Russia: *Two satellites of the Meteor-2 and -3 series, in circular orbit inclined at approximately 82°, continue operating beyond their lifetimes and with reduced capabilities. The first of the new Meteor-3M generation of polar satellite, Meteor-3M-N1, is being prepared for launch into a morning sun-synchronous orbit late in 2001.*

Meteor-3M-N2 is planned for launch in 2004-2005. The second Russian geostationary satellite, GOMS-Electro-N2, is planned for launch in 2005 and will be positioned at 76°E.

China: *The FY-2B satellite (launched in June 2000) is located at 105°E. Power supply problems during the 2001 spring eclipse interfered with image transmission and the DCP subsystem. Operations have since recovered but the state of the satellite is closely monitored during eclipse periods. FY-2A (back-up at 86°E since April 2000) remains in good condition except for a de-spin subsystem defect. Because of good performance of the FY-1C polar satellite, the launch of FY-1D has been postponed to the first half of 2002. The first of a second generation of polar satellites, FY-3A, is scheduled for launch in 2004.*

Japan: *GMS-5, the current operational geostationary meteorological satellite, will continue to operate at 140°E until the next generation. MTSAT-1R is planned to be launched in early 2003 and MTSAT-2 in 2004.*

India: *INSAT-1D operates at 74°E and INSAT-2E at 83°E. INSAT-2B has an inclined orbit and is the back-up satellite. INSAT-3A and METSAT (with an imager similar to the INSAT-2E VHRR) are scheduled to be launched mid-2002. INSAT-3D is planned for launch in 2004. It will have an advanced imager with six channels and a 19-channel sounder.*

Weather satellite experts meet in Capri

International representatives of all the major meteorological satellite operators known as the Coordination Group for Meteorological Satellites (CGMS), held their 29th meeting on the Italian island of Capri.

Experts from China, India, Japan, Russia and the USA met with representatives of EUMETSAT, the World Meteorological Organization and the International Oceanographic Commission of UNESCO to discuss and formulate plans on matters of common interest. EUMETSAT acted as the secretariat for the meeting.

During the five-day meeting in October this year, the CGMS discussed a range of topics including operational continuity of meteorological satellite systems, back-up agreements, data dissemination and exchange, training and future

meteorological satellite systems.

Since 1972, the CGMS has provided a forum in which the satellite operators have studied, jointly with the WMO, technical operational aspects of the global network, to ensure maximum efficiency and usefulness through proper coordination in the design of the satellites and in the procedures for data acquisition and dissemination.

The specific design of each of the satellites is based on national and regional requirements for data and services and therefore some differences in design and mission are inevitable. However, the regular meetings of the CGMS have permitted a gathering and exchange of results during the course of the development of each system. A considerable measure of coordination and standardisation has been achieved.