EARSeL

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European Association of Remote Sensing Laboratories

Front Cover – Turkish, Lebanese mountains and the Golan plateau are the main water reservoirs in the far-East. Important equipments were and are being built up to manage these resources. Their use can cause many disputed issues. Changes in sub-regional climate with a trend to seasonal pattern changes and overall precipitation reduction could only worsen that situation. Severe consensus measures have to be adopted to face it. IRWM DSS tools may prove useful to build up relevant parts of the answers. MERIS/ENVISAT Image; February 8th, 2008, © ESA

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CONTENTS

1. EDITORIAL

Dear members,

We hope you have enjoyed the 28th EARSeL Symposium in Istanbul as much as we did. For those that did not manage to attend, we are sorry to say that you have missed a very well organised event, and a series of very interesting presentations. It has certainly set high standards to meet for the next EARSeL Symposium that we will be organising in Chania. It was also very encouraging to see a large number of young scientists participating and presenting, along with the veterans.

Speaking of veterans, the book on EARSeL's History has now been published and many of you already hold a copy. It is an incredible compilation of information on the history of EARSeL in these 30 years of its existence. Gunnar Østrem described the process of realising this project at the General Assembly in Istanbul, but for those who missed that presentation, an article on that presentation is included in this issue, by Gunnar Østrem.

If you take a look at the title of the news articles of this issue, you will realise that there is a great focus on particular topics: the applications of earth observation data on disaster monitoring and climate change. In addition, there is also news on plans for the implementation of new sensors and platforms that can potentially serve those two applications, including the eagerly awaited Sentinel series. The news suggest that earth observation data have proven their value in dealing with the two global issues of monitoring disaster and climate change, to the national and international administrations.

We would like to wish you a very nice summer and we hope you all enjoy your summer vacations.

Sincerely,

The Editorial Team

2.NEWS FROM MEMBERS

2.1 28th EARSeL SYMPOSIUM AND WORKSHOPS: "REMOTE SENSING FOR A CHANGING EUROPE"

After Voss (Norway, 1981), Igls (Austria, 1982), Brussels (Belgium, 1983), Guildford (UK, 1984), Strasbourg (France, 1985), Lyngby (Denmark, 1986), Noordwijk (Netherlands, 1987), Capri (Italy, 1988), Helsinki (Finland, 1989), Toulouse (France, 1990), Graz (Austria, 1991), Eger (Hungary, 1992), Dundee (UK, 1993), Göteborg (Sweden, 1994), Basel (Switzerland, 1995), Malta (1996), Lyngby (Denmark, 1997), Enschede (Netherlands, 1998), Valladolid (Spain, 1999), Dresden (Germany, 2000), Paris (France, 2001), Prague (Czech Republic, 2002), Ghent (Belgium, 2003), Dubrovnik (Croatia, 2004), Porto (Portugal, 2005), Warsaw (Poland, 2006), and Bolzano (Italy, 2007), the EARSeL family met in a city where the continents meet. The '*28th EARSeL Symposium and Workshops'* with the title *'Remote Sensing for a Changing Europe'* took place in Istanbul, Turkey on 2-7 June 2008. Both the symposium and the accompanied two workshops were hosted by the Remote Sensing Division of the Istanbul Technical University (ITU) at the Süleyman Demirel Convention Centre in the ITU Maslak Campus. The Symposium was chaired by Prof. Dr. Derya Maktav, Head of ITU Remote Sensing Department and co-chair of EARSeL SIG Urban Remote Sensing, and Prof. Dr. Rudi Goossens, Chairman of EARSeL. The Turkish Chamber of the Cadastre and Mapping Engineering, and the Scientific and Technological Research Council of Turkey (TÜBİTAK) also supported the meeting.

Technical presentations were on all fields of geo-information and remote sensing, and especially on:

- Geoinformation and remote sensing
- New sensors and instruments
- Image processing techniques
- Time series analysis, data fusion
- Imaging spectroscopy
- Urban remote sensing, land use and land cover
- Radar remote sensing, LIDAR
- Land degradation and desertification
- Hydrology, land ice & snow, coastal zone
- Forestry, agriculture
- 3D spatial analysis
- World heritage

The meeting welcomed 220 registered participants from all over the world.80 papers were presented during the symposium (2-5 June) at the 21 oral sessions including the three special sessions. Besides, 60 papers were presented at the poster sessions which were also presented during two 'oral communications' sessions, where the authors had the opportunity to present their poster papers for 4-5 minutes and invite the participants to visit their posters for detailed information. The ITU Süleyman Demirel Convention Centre with one conference hall, one senate hall and four workshop rooms served for the event.

In addition to these topics, the symposium also included three special sessions:

- The special session 'ASTER' jointly held by ASTER and EARSeL, included applications of ASTER, such as the usefulness of thermal remote sensing images in the study of wet permafrost, and crop and water monitoring at the scale of a small agricultural region from ASTER data.
- "SPOT" special session, jointly held by SPOT and EARSeL, focused on the new ASTROTERRA mission; a global database designed to build consistent and accurate geospatial datasets; assessing agri-environmental impact in the French West Indies and French Guiana; and the operational use of SPOT imagery for population and housing census in Africa.
- The third special session 'Seismic Geohazards' chaired by Freek van der Meer, chair of the SIG Geological Applications, integrated valuable presentations on ASTER and geo-hazards; evaluation of the damaged provoked by seismic events through remotely sensed imagery; application of an integrated airborne hyperspectral and lidar dataset in resolving the frequency and intensity of earthquakes; predicting topographic aggravation of seismic ground shaking by applying geospatial tools; and tropical volcanic islands, coastal landslides and tsunami risk.

To encourage the establishment two new SIG's, "*Remote Sensing for Archaeology and Cultural Heritage*" (3 June) and "*Thermal Remote Sensing*" (4 June), in addition to the already existing 14 SIG's, two lunch meetings were organized where the chairmen had the opportunity to advertise their new groups.

The 'SIG on Remote Sensing for Archaeology and Cultural Heritage', co-chaired by Dr.Rosa Lasaponara and Dr.Nicola Masini (Italy), addressed the researchers interested in the application of active and passive remote sensing technologies (ground, aerial and satellite) and in the information technologies for archaeological investigation, protection and valorization of cultural heritage.

Dr. Claudia Kuenzer of the German Remote Sensing Data Centre, DFD of the German Aerospace Centre, DLR presented the newly founded 'SIG on Thermal Remote Sensing', has been presented by About 20 participants joined the lunch meeting and presentation, during which the goals of this new SIG were introduced. SIG-TRS envisages bringing the thermal community among the EARSeL laboratories closer together, and promoting a platform for exchange about methods, applications, new sensors and in-situ approaches in the field of thermal remote sensing.

The ITU Centre for Satellite Communications and Remote Sensing (ITU-CSCRS) where we had the technical visit is located at the ITU Maslak Campus and is one of the forthcoming institutions around the world with a highly capable ground receiving station unit. It is the first centre established in Turkey to conduct application oriented projects in remote sensing and satellite communications technologies and serve national-international civil-military companies in their research, development, and educational activities. CSCRS has the capabilities of acquiring images from remote sensing satellites, processing data, and sending the products via satellite links to resident and foreign users. The station can receive images of the Earth's surface within a radius of 3000 km., which covers from Sweden to Sudan, and England to Kazakhstan. In the centre the data acquired from SPOT-2, SPOT-4, RADARSAT-1, ERS-2, NOAA-11, NOAA-14, and METEOSAT satellites are archived, formatted and processed with the state-of-the-art technology.

The audience of a presentation on ITU-CSCRS activities.

After the technical visit at ITU-CSCRS on 2 June the icebreaker party of the symposium was organized in the same place on the same day.

In addition to the technical meetings, EARSeL-bureau meeting, Council meeting, co-editors meeting, and General Assembly took place on different dates during the event.

The participants of the symposium discovered the wealth of impressive sights all along the shores in a Bosporus boat trip along Istanbul's famous waterway dividing Europe and Asia.

Symposium dinner took place at a restaurant close to the leg of the Fatih Sultan Mehmet Bridge from where a beautiful picture of the Bosporus could be viewed.

In conjunction with the symposium two workshops ran parallel and after the end of the symposium:

The 1st Workshop "Earth Observation From Research to Teaching in Schools and Universities" of the "Special Interest Group (SIG): Education and Training" of EARSeL chaired by Mario Hernandez, UNESCO; Rainer Reuter, University of Oldenburg, Germany; and Alexander Siegmund, University of Education Heidelberg, Germany, on 6 June, aimed at making the results obtained from more than 250 EARSeL member institutes available to the public. The workshop further addressed the Global Environment and Security (GMES) programme of the European Commission (EC) and the European Space Agency (ESA).

The topics of the workshop included: earth observation for kids; science education at schools, high schools and universities; applications in biology, chemistry, geography, physics and mathematics curricula;

training activities in (GMES); the Global Earth Observation System of Systems (GEOSS) and other international programmes; and public outreach of environmental sciences and global change.

On 7th of June, a meeting of the EARSeL project "Science Education through Earth Observation for High Schools (SEOS)" followed the workshop, which was an initiative for using remote sensing in science education curricula in high schools funded under the 6th Framework Programme of the EC. 11 different partners from several European countries in cooperation with the ESA have so far implemented the project.

The second workshop of the symposium was organized as the 4th Workshop of the EARSeL SIG on Developing Countries (chaired by Gürcan Büyüksalih, Turkey; Richard Sliuzas, Holland; and Peter Lohmann, Germany), in conjunction with 8th workshop of the GIS in Developing Countries network (GISDECO 8), with the title "Integrating GIS and Remote Sensing in a Dynamic World" on 4 -7 June 2008.

This workshop brought together experts from EARSeL and GISDECO networks for the first time. Especially for developing countries, integration of remote sensing and GIS offers unique access to primary data on the status of land surfaces, as well as possibilities for analysis, visualisation and development of possible solutions to problems associated with dynamic changes of the nature and humanity. Global urbanisation, climate change and its effects on natural and human systems, land use and land cover changes, and salinisation are imminent dangers. The workshop provided a forum for presenting and discussing results, and for exchanging expertise and experience among researchers and users engaged in solving the problems of developing countries.

The topics of this workshop included:

Adapted sensor and mapping methods (TerraSAR-X, ALOS, ASTER, IKONOS, QUICKBIRD, dynamics of urban development, biomass), environmental monitoring (land degradation, desertification, erosion), model development and integration (land use and cover models, biosphere model, effects of climate change), DEM generation for developing countries (SRTM, Cartosat-2, ALOS-PRISM), innovative remote sensing and GIS education (distance learning, professional development), theory and practice of participatory GIS (case studies on community mapping and PGIS), GIT and poverty alleviation (food and water security, resilience), hazards and risk mitigation (measuring risks and adaptive planning systems), and managing global urbanisation (slum mapping, sustainable transport systems).

I would like to thank to the members of the scientific committee who have contributed to the abstract review process, to the artist Beygü Gökçin who artistically combined space and music with piano; the band of the Turkish Air Force Academy for their exceptional performance at the opening session, to my colleagues from my department, and, of course, to my students for their great efforts before, during and after the symposium.

Finally, I wish good luck and success to my Greek colleagues who will organize the 29th EARSeL Symposium in Crete, Greece in 2009. See you in Crete.

With my best regards,

July, 2008, Istanbul

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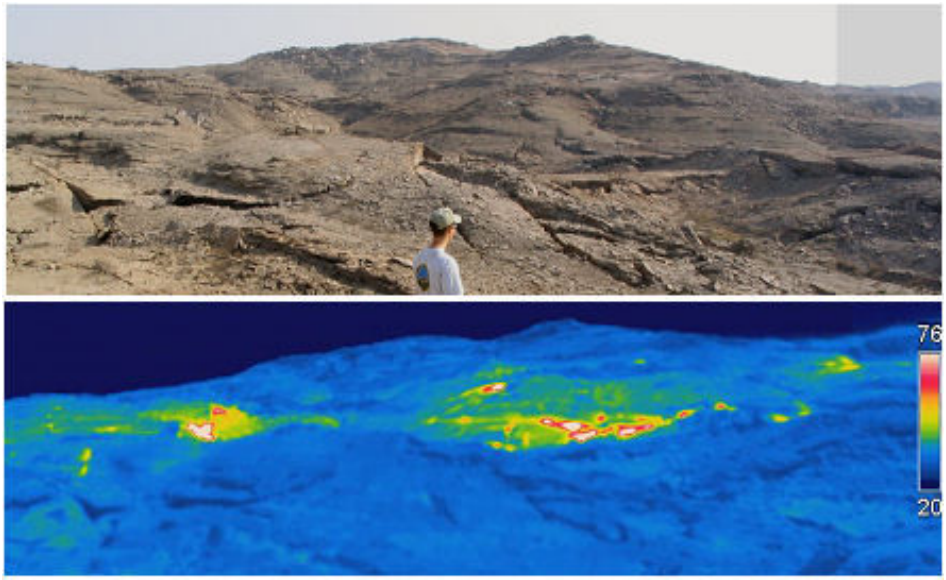
dmaktav@ins.itu.edu.tr

The band of the Turkish Air Force Academy performing at the opening session.



Coal fire area in China: Cracked bedrock due to volume loss underground. Top: normal camera image, bottom: thermal camera image revealing distinct hot spots, where the fires are raging underground, Source: DLR-DFD

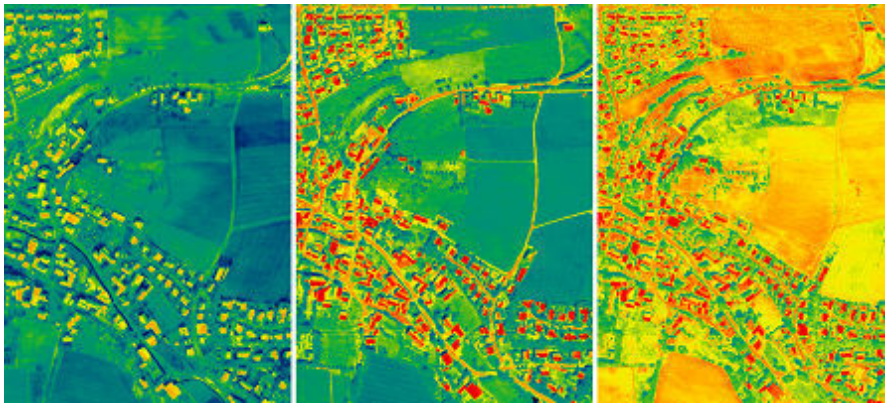
2.2 NEW SPECIAL INTEREST GROUP: THERMAL REMOTE SENSING

As of this year a new EARSeL Special Interest Group on Thermal Remote Sensing has been founded, which is chaired by Dr. Claudia Kuenzer of the German Remote Sensing Data Center, DFD, of the German Aerospace Center, DLR, and Chris Hecker, of the International Institute for Geo-Information Science and Earth Observation, ITC. Both chairs have several years of experience in the field of thermal remote sensing, focussing amongst others on thermal anomaly extraction from multi-sensor data, multi-diurnal and multi-band analyses of hot spot variability, thermal quantification, emissivity analyses, and *in-situ* and laboratory emissivity measurements.

The main objectives of the new SIG-TRS are manifold. It is envisaged that SIG-TRS will bring together European thermal remote sensing scientists from different disciplines, that it will encourage international exchange of knowledge and data common to all thermal research groups independent of application, and that it can lead to an overall increased awareness of the thermal remote sensing community. A strategic long term benefit of the joining of forces under the SIG-TRS should be increased visibility in order to position TRS higher on the agenda for new sensor development in Europe.

The new group aims at achieving these objectives through thermal sessions at EARSeL- and non-EARSeL conferences, and events, thermal workshops in the framework of EARSeL Symposia, and informal hands-on demonstrations, and training courses in thermal field survey or laboratory work.

As a first event of the SIG-TRS it is foreseen to have a one day thermal session during the overall EARSeL Europe conference in Crete, Greece, in April 2009. Invitation for abstracts will be published soon via the EARSeL website as well as via the soon-to-come new EARSeL SIG-TRS website. The SIG as well as the thermal session at the conference in Crete are hoped to attract and bring together diverse target groups from technical fields such as thermal anomaly detection, emissivity analyses and mapping, apparent thermal inertia approaches, sub-pixel thermal mapping, time series exploitation and change detection, thermal flux analyses, thermal field and laboratory spectrometry, and many others. These should include application fields such as LST-retrieval, evaporation studies, urban



Deadalus airborne thermal images at 0.8m spatial resolution of a suburb area near Paderborn, as seen in winter, spring and summer. Source: DLR-IMF

climatology, rock and mineral discrimination, volcano observation, geothermal analyses, coal- and forest fires, security applications, heat pollution, hydrology, and many more. During the conference in Crete a one day field trip is currently in the planning, where the group's chairs will provide hands-on training for thermal in-situ measurements. This includes emissivity spectral measurements with a thermal spectrometer, data acquisition with a thermal camera, radiometer measurements, and presentation of thermal sampling strategies.

If you are interested in joining the activities of SIG-TRS, and would like to be included in the SIG-TRS mailing list, please contact Claudia Kuenzer at DLR via: claudia.kuenzer@dlr.de and Chris Hecker at ITC, via: hecker@itc.nl.

2.3 REPORT ON EARSeL WORKSHOP: "REMOTE SENSING – NEW CHALLENGES OF HIGH RESOLUTION"

From March 5th. – 7th 2008, an EARSeL Joint Workshop entitled "Remote Sensing – New Challenges of High Resolution" was held at the Ruhr University in Bochum, Germany. It was the first workshop where four different EARSeL Special Interest Groups (SIGs) met at one location; those were: 3D Remote Sensing, Developing Countries, Radar Remote Sensing and Urban Remote Sensing.

The workshop started with an excellent opening talk given from Richard Sliuzas, ITC (International Institute for Geo-Information Science and Earth Observation), Netherlands. As an urban planner he pointed out the importance of high resolution imagery especially for the mapping of slums in Developing Countries.

In the first two sessions new techniques for the handling and processing of Cartosat (3D SIG) and the analysis of high resolution spaceborne image data (Developing Countries SIG) were presented. The mapping results of Land Use Land Cover (LULC) for Beijing and Munich were the topic of the following session (Urban SIG). The parallel Developing Countries session consisted of two talks about general mapping methods from space and the generation of a bio-geo database for the Himalaya region. Urban remote sensing leads to reliable mapping results based on hyperspectral image data and even pioneer vegetation can be extracted from satellite remote sensing imagery (SIG Urban RS). A multi-sensor image analysis of Bangladesh, the development of a poverty index and the use of Digital Elevation Models for the mapping of mountainous areas were presented in a session organized by the SIG Developing Countries. The Radar SIG session consisted of four talks, where spaceborne and airborne radar data have been used for mapping of bridges (important in case of damages) and the estimation of building heights. However, optical data has to be used in most cases additionally for visualization in true color and for comparison of the results extracted from radar image data. The following 3D SIG session had two lectures on urban 3D city modelling; one talk was about the use of high resolution image data (e.g. Quickbird) for the estimation of newly built up area in the Istanbul region. A Radar session dealt with first TerraSAR-X data and

analysis results. The huge potential of the high resolution radar data and the advantages compared to optical image data (recording at night and even through clouds) especially for the mapping of urban areas was outlined in the first two talks. The combination of TerraSAR-X data with optical data by the use of a smart image fusion algorithm was the topic of the last presentation. The parallel Urban Session dealt with long term high resolution airborne remote sensing for the City of Graz, the analysis of multi-hyperspectral data for urban change mapping and the presentation of newly developed methods for object based image analysis. Corona spy images acquired in the 1960s are still useful for the reconstruction of ancient LULC and cliff retreat along the Portuguese shore is monitored with historical aerial images (3D session). The parallel Developing Countries session presented a method for the monitoring of soil degradation processes in Ukraine and the fight against malaria outbreaks in Cameroon with additional usage of Google Earth.

A poster session was held parallel to the oral presentations. An attractive and communicative social programme was organized by the Ruhr University, namely Carsten Juergens and his eager student team. Special thanks are directed of course to Gesine Boettcher, the EARSeL secretary.

The overall resume of this first Joint Workshop is very positive. It must be stated that the synergetic findings are fruitful and the interdisciplinary scientific exchange between members of different SIGs leads to huge overall benefits. The concept of a Joint Workshop has been proofed very well and it should definitely be kept for future EARSeL meetings.

Matthias S. Moeller,
Austrian Academy of Sciences,
Salzburg, Austria

2.4 REVIEW OF "IMAGING SPECTROSCOPY: NEW QUALITY IN ENVIRONMENTAL STUDIES"

Imaging Spectroscopy: new quality in environmental studies. Zagajewski, B & Sobczak, M. (eds), European Association of Remote Sensing Laboratories / Warsaw University, Warsaw (2005). 850pp. Hardback. ISBN 83-89502-41-0. €70/€78 including postage inside/outside the EU. Order from: secretariat@earsel.org

The book is a collection of several non-peer-reviewed papers that were presented at the 4th EARSeL SIG-IS meeting in Warsaw, Poland during April 2005. The papers in this book present up-to-date research studies in the newly emerging field of remote sensing technology, namely, "imaging spectroscopy". The papers focus both on environmental issues that can be monitored by this technology, and also on sensors, missions, and modeling facilities using this technology. Although the title of the book suggests a textbook in "imaging spectroscopic" techniques, the actual contents are less promising in this regard because the book consists of a collection of papers, some of which are premature for publication. The EARSeL SIG-IS group, which was established in Europe in the past decade, is one of the best groups for studying and dissimilating IS technology. The authors of the papers are well known worldwide in the remote sensing discipline and are experts in IS technology from many perspectives. The papers appearing in this volume are very important and some serve as precursors for more studies of peer review papers to come. All in all, this book is a very interesting accumulation of scientific works that were conducted in Europe from 2003-2005 on IS technology; importantly, it summarizes the most up-to-date papers. The chapters of the book are well chosen and well represent the spirit of the workshop. This is in spite of the fact that many talks from this workshop were not included. Unfortunately, some of the papers are not classified correctly under a category, such as "using IS for quantitative determination of soil iron content in partially vegetated areas" which should be classified not in the "Environmental Modeling" chapter but in the "Geology" chapter (more examples can be found). Nevertheless, the book is a treasure for workers in the IS field and no doubt introduces the potential of this technology to many others who have not yet been exposed to this field. Except for the fact that it is hardly (if at all) mentioned in the book that it actually represents a conference proceedings, I enjoyed the book and appreciated very much the efforts of the editors to publish it.

Eyal Ben-Dor
Tel-Aviv University

2.5 NEW EARSeL MEMBER – EUROPEAN ACADEMY OF BOLZANO (EURAC)

We would like to welcome a new member to the EARSeL communitiy: The European Academy of Bolzano (EURAC).

In September 2006, the Institute for Applied Remote Sensing began its work at the European Academy of Bolzano (EURAC) with the support of the provincial government of South Tyrol. It closely collaborates with other EURAC research institutes such as Alpine Environment, Regional Development and Location Management, and Renewable Energy. Located at an exceptional place in the heart of the Alps, the Institute forms already now an important part of EURAC's competence centre for research in mountain regions.

The main purpose of the Institute is to develop new and better applications of satellite imagery and aerial photography for scientific monitoring and investigation of surface and atmospheric conditions in mountainous areas. Work of the Institute covers or will cover in near future the 'spheres' SOCIETY, AIR, WATER / SNOW & ICE and LAND.

Member details:
EURAC - European Academy Bolzano
Institute of Applied Remote Sensing
Viale Druso 1
39100 Bolzano
Italy
EARSeL Representative: Dr. Marc Zebisch

2.6 OTHER NEW EARSeL MEMBERS

In addition the following members have recently registered with EARSeL:

Ben Gurion University of the Negev
Earth & Planetary Image Facility (EPIF)
Geography
P.O.Box 653
84105 Beer-Sheva, Israel
EARSeL Representative: Dr. Dan Blumberg

Mars Inc., Catalyst Research Team
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EARSeL representative: Ms Evy Binon

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3. NEWS ITEMS

3.1 CYCLONE NARGIS HITS MYANMAR

GIS layers of Ayeyarwady district of Myanmar. At 1:50,000 scale, including settlements, major roads, rivers, relief, administrative boundaries and indicative flood extends caused by Nargis. Credits: Respond, KeyObs

On May 2nd, 2008, tropical cyclone 'Nargis' swept over Myanmar and left behind a path of destruction. Wind speeds of more than 200 km/h and a storm surge of up to 3 metres in height destroyed more than 90 percent of housing and large parts of infrastructure in some regions, especially within the low-lying coastal delta, a heavily populated area and the capital Yangon. Cyclone Nargis has left up to 2.4 million people in need of humanitarian assistance, and it is believed that 130,000 people have either died or are still missing since the storm struck Myanmar on 2 May.

UN-SPIDER has been actively involved in facilitating the access and use of space-based information to support the emergency response efforts. The United Nations, through UNOOSA as a Cooperating Body, activated the International Charter Space and Major Disasters, which once again came forward to support the work of the UN and emergency relief efforts.

Keyobs, a partner of “Respond” (one of the 2nd tranche of ESAs GMES Service Element (GSE) projects) has completed comprehensive mapping at 1:50,000 scale over Ayeyarwady district of Myanmar, a short time after the disaster occurred. This was initially supplied in preparedness for severe flooding events and provided an updated overview of the main coastal region featuring information on populated places, transportation, hydrographic network and administrative limits.

Source: Respond homepage, 30 on June 2008

3.2 ESA'S MOST ADVANCED NAVIGATION SATELLITE LAUNCHED

The Soyuz - Fregat launch vehicle carrying GIOVE-B, the second of ESA's two Galileo In-Orbit Validation Element demonstrators for the Galileo global navigation satellite system, lifts off from launch complex at the Baikonour spaceport, Kazakhstan, on April 27, 2008. Credits: ESA - S. Corvaja 2008

A further step towards the deployment of Europe's Galileo global navigation satellite system was taken earlier this year, with the successful launch of ESA's second Galileo In-Orbit Validation Element (GIOVE-B) satellite, carrying the most accurate atomic clock ever flown into space.

The GIOVE-B satellite was lofted into a medium altitude orbit around the earth by a Soyuz/Fregat rocket departing from the Baikonur cosmodrome in Kazakhstan by launch operator Starsem. Lift-off occurred at 04:16 local time on 27 April (00:16 Central European Summer Time). The Fregat upper stage performed a series of manoeuvres to reach a circular orbit at an altitude of about 23 200 km, inclined at 56 degrees to the Equator, before safely delivering the satellite into orbit some 3 hours and 45 minutes later. The two solar panels that generate electricity to power the spacecraft deployed correctly and were fully operational by 05:28 CEST.

This 500 kg satellite was built by a European industrial team led by Astrium GmbH, with Thales Alenia Space performing integration and testing in Rome. Two years after the highly successful GIOVE-A mission, this latest satellite will continue the demonstration of critical technologies for the navigation payload of future operational Galileo satellites.

Three high-accuracy space clocks aboard
Like its predecessor, GIOVE-B carries two redundant small-size rubidium atomic clocks, each with a stability of 10 nanoseconds per day. But it also features an even more accurate payload: the Passive Hydrogen Maser (PHM), with stability better than 1 nanosecond per day. The first of its kind ever to be launched into space, this is now the most stable clock operating in earth orbit. Two PHMs will be used as primary clocks onboard operational Galileo satellites, with two rubidium clocks serving as back-up.

GIOVE-B also incorporates a radiation-monitoring payload to characterise the space environment at the altitude of the Galileo constellation, as well as a laser retroreflector for high-accuracy laser ranging. Signal generation units will provide representative Galileo signals on three separate frequencies broadcast via an L-band phase array antenna designed to entirely cover the visible earth below the satellite.

The satellite is now under the control of Telespazio's spacecraft operations centre in Fucino, Italy, and in-orbit checking-out of the satellite has begun. In addition to its technology-demonstration mission, GIOVE-B will also take over GIOVE-A's mission to secure the Galileo frequencies, as that first Galileo demonstration satellite launched in December 2005 is now approaching the end of its operational life.

Beyond GIOVE-B, the next step in the Galileo programme will be the launch of four operational satellites, to validate the basic Galileo space and related ground segment, by 2010. Once that In-Orbit Validation (IOV) phase is completed, the remaining satellites will be launched and deployed to reach the Full Operational Capability (FOC), a constellation of 30 identical satellites.

"With the successful launch of GIOVE-B, we are about to complete the demonstration phase for Galileo", said ESA Director General Jean Jacques Dordain in Fucino while congratulating the ESA and industrial teams. "The strong cooperation between ESA and the European Commission has been instrumental in making progress in a difficult environment over the past few years; and, even with that being so, Galileo has already materialised, with two satellites now in orbit, significant headway made on the next four (already in the construction phase) and a fully qualified EGNOS service[1] - all this designed to serve citizens in Europe and all around the globe. ESA will begin shortly the procurement process for the overall constellation beyond IOV under EC responsibility."

Galileo will be Europe's very own global navigation satellite system, providing a highly accurate, guaranteed global positioning service under civil control. It will be interoperable with the US Global Positioning System (GPS) and Russia's GLONASS, the two other global satellite navigation systems. Galileo will deliver real-time positioning accuracy down to the metre range with unrivalled integrity.

Numerous applications are planned for Galileo, including positioning and derived value-added services for transport by road, rail, air and sea, fisheries and agriculture, oil-prospecting, civil protection, building, public works and telecommunications.

Source: ESA homepage on 27 April 2008

3.3 EUROPEAN CONFERENCE ADDRESSES INCREASING DEMAND FOR EO DATA

For more than 40 years, Earth observing satellites have delivered valuable data about our planet and have enabled a better understanding and improved management of the Earth and its environment. Demands for these data are increasing daily as decision-makers are faced with responding to environmental change, managing sustainable development and responding to natural disasters and civil security issues.

In order to address these needs, ESA, the German Space Agency (DLR) and the German Aerospace Industries Association

[1] European Geostationary Navigation Overlay Service. EGNOS is a joint programme being carried out by the European Space Agency, the European Commission and Eurocontrol. It comprises a network of more than forty elements all over Europe that collect, record, correct and improve data from the US Global Positioning System. The modified signals are then relayed via geostationary satellites to user terminals, offering positional accuracy better than two metres, compared with 15 to 20 metres for GPS alone. In addition, EGNOS provides a guarantee of signal quality that GPS does not

(BDLI) jointly organised a conference aimed at identifying the challenges ahead and exploring specific needs for the future. European experts from ESA and DLR attended the conference being held on 27 and 28 May on the occasion of the ILA Berlin Air Show in Germany to provide an overview of existing Earth observation (EO) applications in the area of climate, environmental management and the civil security sector.

Representatives from public authorities, private companies and international organisations attended the conference entitled 'Earth observation: Solutions for Decision Making' to explore specific demands for EO products.

Speaking at the conference, Dr Volker Liebig, ESA's Director of Earth Observation, outlined ESA's vigorous EO programmes, which include launching 17 satellites over the next seven years. These include the family of Earth Explorers that will measure key Earth system processes to understand their role in climate change and the Sentinels that will provide operational information services for global monitoring of the environment and security.

ESA's Head of Science, Applications and Future Technologies Department Dr Stephen Briggs introduced ESA's Climate Change Initiative, a new Programme Proposal that will be presented to the ESA Ministerial Council in November 2008.

The objectives of the programme will focus on the delivery of satellite-based 'Essential Climate Variables' to support climate change modelling and prediction.

"Satellite data are critical in providing the basic information for modelling and predicting climate change," Briggs said. "The new initiative will ensure that ESA's potential in this area is fully realised." The fleet of ESA's EO satellites has gathered enormous amounts of data relevant for providing this information. Archived over 30 years and increasing daily, these data will form the basis for extracting the variables most relevant to climate change.

ESA and its member states will process the information in a form readily usable by the scientific community and governmental bodies in order to achieve their policies and to support the Intergovernmental Panel on Climate Change (IPCC) and United Nations' conventions.

Source: ESA homepage on 28 May 2008

3.4 EARTH OBSERVATION HIGHLIGHTED AT UN BIOLOGICAL DIVERSITY CONFERENCE

Addressing the global issue of biodiversity loss, participants from all over the world recently gathered in Germany to attend the UN's Convention of Biological Diversity Conference of Parties. During the conference, data from Earth observation satellites was highlighted as playing a crucial role in the conservation of biological diversity and sustainable development.

In recognition of the importance of biological diversity in sustaining the Earth's population of six billion, the UN Convention on Biological Diversity (UNCBD) was signed by 150 government leaders at the Earth Summit in Rio de Janeiro, Brazil in 1992. As a result, world governments have agreed to significantly reduce the current rate of biodiversity loss by 2010. The Conference of Parties (COP) is the Convention's governing body and advances implementation of the Convention through the decisions it takes at periodic meetings.

COP9 meeting
The ninth meeting of the COP was held in Bonn, Germany from 19-30 May and was attended by almost 7000 participants from 191 countries. ESA hosted a side event at COP9, in which speakers from various UN agencies highlighted the overarching role that Earth observation (EO) satellites play in providing vital information to implement and assess the progress of several UN treaties related to biodiversity. The side event was chaired by Gerald Braun who is from the German Space Agency (DLR) and an ESA delegate.

Representatives from the Ramsar Convention on Wetlands, the UN Convention to Combat Desertification (UNCCD) and the UNESCO World Heritage Convention, which are all supported by ESA, expressed their satisfaction and confirmed the usefulness of EO data. Nick Davidson from the Ramsar Convention on Wetlands introduced the GlobWetland project as an example of how EO data can be used for wetland assessment, monitoring and management.

He said that, "Often made up of complex and inaccessible terrain, monitoring ecological changes in wetlands without the use of satellite data is very difficult. The project produces land-use cover and

change detection maps for use by wetland managers and policymakers. ESA EO data has considerable power and potential in providing the intelligence behind making sound decisions on management and policy."

ESA side event
Also speaking at the event, UNESCO's Mario Hernandez outlined joint programmes undertaken by UNESCO and ESA, including mapping World Heritage sites such as in ESA's Diversity project and gorilla natural-habitat monitoring. The Diversity project, which kicked-off last year, aims to contribute to the monitoring efforts that will help the UNCBD determine whether progress is being made in reducing biodiversity loss and provide insight into which policy measures are proving most effective. For example, the Diversity project has demonstrated the use of EO data for monitoring selected headline indicators of biodiversity loss such as trends in the extent of global drylands.

Licio de Rosario from the Portuguese National Focal Point Assistant for the UN Convention to Combat Desertification (UNCCD also spoke at the event and presented DesertWatch, a joint UNCCD-ESA programme designed to assist parties with implementation.

Land cover map
The importance of land-cover mapping was very evident at the meeting and was included as being an important tool by many of the speakers. In particular, Martin Herold from Global Observation for Forest and Land Cover Dynamics expressed the potential for satellite observations for the post - 2012 negotiations of the UN Framework Con-vention on Climate Change and for driving national observation progress for forests.

From an economic perspective, Jean-Louis Weber from the European Environment Agency (EEA) provided insight into a less obvious way in which EO data is helping measure how the loss of biodiversity is affecting our quality of life in terms of wealth. The current thinking is that when calculating a country's gross domestic product, a monetary value should be included to represent the costs to an ecosystem that have come about through providing various goods and services.

An extensive study on ecosystem accounts for Mediterranean wetlands is being carried out that relies on land-cover maps derived from EO data to assess economic costs to the environment. This study is part of the Economics of Ecosystems and Biodiversity report, a joint initiative of the German Ministry for Environment and the E.C..

ESA's Oliver Arino also spoke during the event outlining support for a number of multilateral environment agreements, including those governing biodiversity, desertification, climate change, wetland and marine projects. For instance, he explained how sea-surface temperature maps matched with hammerhead shark tagging experiments show how migration routes are linked to ocean conditions.

The wildlife migration service developed within the Diversity project relies on near real-time satellite-derived maps of oceanographic conditions such as sea-surface temperature, water quality and surface currents in the Tropical East Pacific Corridor. The different EO data products are derived using results from ESA's Medispiration and GlobColour projects.

The essence, discussions held at the UNCBD-COP9 highlighted how EO-derived data is proving invaluable in providing an insight into the change of land cover as well as changes in marine and fresh water environments. Since biological diversity is intrinsically linked to such changes, biodiversity loss can be assessed at local, regional and global scales through a broad-range of applications. As the world's population grows and biodiversity diminishes, it was also made clear that EO-data is becoming an increasingly important tool in attempts to achieve sustainable development.

Source: ESA homepage on 03 June 2008

3.5 CHINA EARTHQUAKE GEOSPATIAL RESEARCH PORTAL

The Harvard Centre for Geographic Analysis and Harvard Fairbank Centre for East Asian Research have established a China Earthquake Geospatial Research Portal. This website contains maps, GIS data and GIS analysis aimed at assist ongoing research on the recent earthquakes in China.

CEGRP is collecting and distributing GIS layers and related information for interac-

tive examination of the earthquake region. The site hosts a map server for the sharing and visualisation of datasets relevant to the earthquake and its after-effects.

Users are encouraged to explore and publish datasets online. Two GIS vector layers are available for download, the first showing the earthquake epicentres and aftershocks, and the second illustrating the impact zones.

Other information posted on the site includes photos and narrative documentation of specific sites, links to agencies conducting GIS analysis of the earthquake and historical and demographic information related to the earthquake region. The site also collects news articles published in the New York Times, BBC News and aid organisation, Relief Web.

CEGRP was developed by Lex Berman, project manager and lead developer of the China Historical GIS Project at the Harvard Centre for Geographic Analysis in partnership with Bao Shuming, China Data Centre, University of Michigan, and Lin Hui, Institute for Space Earth and Information Science.

Source: ASM homepage on 06 June 2008

3.6 GEOEYE MAKES PROGRESS ON A THIRD-GENERATION COMMERCIAL EARTH-IMAGING SATELLITE

Last fall, GeoEye announced it had contracted with ITT to begin the phased development of the camera for GeoEye-2, slated for launch in the 2011 timeframe. Currently, GeoEye and ITT are working on the sensor electronics and other elements of the camera's telescope, including the primary mirror. The company has also procured additional long-lead focal plane electronic components from ITT which will be integrated into the next higher level of assembly for the sensor system.

Bill Schuster, GeoEye's chief operating officer said, "By beginning work on the advanced camera and electronics early, we will keep to a schedule so we are able to launch GeoEye-2 in the 2011-2012 timeframe. With the delivery of the glass to ITT, we are demonstrating that GeoEye can be counted on in the long run to be a provider of map accurate satellite imagery as we move to select a satellite builder later this year."

GeoEye-2's glass blank mirror was completed and delivered to ITT last month. The company's Rochester, N.Y.-based Space Systems Division will begin grinding and polishing the mirror that measures 1.1 metre in diameter later this summer. The satellite will be of the same general class as GeoEye-1 but will benefit from significant improvements in capability, including enhanced direct tasking, and the potential to collect imagery of the Earth's surface at 0.25-metre or 9.75-inch ground resolution.

Rob Mitrevski, vice president and director of Commercial and Space Science Systems, ITT Space Systems, said, "The telescope and camera assembly for GeoEye-2 will benefit from decades of expertise ITT has amassed on behalf of the U.S. Government and other commercial customers. Once operational, the satellite's imaging system will provide a resolution and accuracy never achieved before in commercial remote sensing."

GeoEye believes the market will be ready for another sensor to serve the growing geospatial or location-based market in the U.S. and overseas in the 2011-2012 timeframe. While GeoEye has an operating license from the National Oceanic and Atmospheric Administration (NOAA) to build and launch a satellite constellation with this extremely high ground resolution of a quarter meter, the final decision regarding GeoEye-2's resolution has not yet been made. If the satellite is built to achieve this high resolution, under current licensing constraints, only the U.S. Government would be allowed access to imagery at this highest resolution. All other customers would receive imagery at the highest resolution allowed by U.S. regulations, currently 0.5-metre or 19.5-inch ground resolution. In addition, GeoEye's agreements with foreign customers involving large volumes of imagery generally require approval from NOAA.

For more information about the August 22, 2008 launch of the GeoEye-1 satellite visit: http://launch.geoeye.com/.

Source: GeoInformatics homepage on 11 June 2008

3.7 NASA AIRCRAFT EXAMINE IMPACT OF FOREST FIRES ON ARCTIC CLIMATE

As the summer fire season heats up, NASA aircraft are set to follow the trail of smoke plumes from some of Earth's northernmost forest fires, examining their contribution to arctic pollution and implications for climate change.

Starting June 29, NASA's DC-8 and P-3B aircraft, based at a Canadian military base in Cold Lake, Alberta, will begin their final three-week deployment of the Arctic Research of the Composition of the Troposphere from Aircraft and Satellites, or ARCTAS, mission. A third NASA aircraft, the B-200 King Air, will fly from Yellowknife, Canada. The mission is the most extensive field campaign ever to study the chemistry of the Arctic's lower atmosphere. The three airborne laboratories are equipped to fly through the smoke plumes of northern-latitude forest fires. The resulting data, when combined with simultaneous satellite measurements, could reveal the impact of forest fires on the arctic atmosphere.

"The summer campaign will focus on boreal forest fire emissions," said Jim Crawford, manager of the Tropospheric Chemistry Program at NASA Headquarters in Washington. "Coupled with the observations of arctic haze during the spring deployment based in Alaska, these data will improve our understanding of the relative importance of these two influences on arctic atmospheric composition and climate."

Boreal forests, which span Earth's northern latitudes, have seen a rise in natural forest fires during the last decade. Researchers have debated the degree to which these fires contribute to the Arctic's atmosphere compared to other sources, such as human-caused emissions from lower latitudes. The ARCTAS flights through smoke plumes, over and downwind from their source, will reveal their composition and transport path.

Researchers also will use the data to examine how the chemistry of smoke plumes changes over time and distance. Plume chemistry can contribute to the formation of ozone in the lower atmosphere. Particulates in smoke plumes can affect Earth's radiation balance with consequences for climate change. The mission also is expected to help researchers interpret data from NASA satellites orbiting over the Arctic. NASA's Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation, or CALIPSO, satellite can measure the height of various plume components in the atmosphere, information critical to predicting plume movement. Researchers will use data from ARCTAS to validate observations from CALIPSO and other satellites to improve model predictions of fire impacts on chemistry and climate.

"Aircraft experiments provide the greatest possible detail on the state of the atmosphere, but only for short, intense periods of sampling," Crawford said. "By conducting these flights in tight coordination with satellites and computer models, airborne observations lead to improvements in the interpretation of satellite observations and better representation of atmospheric processes in chemistry and climate models. This improves our confidence in models' ability to monitor and predict future changes."

The Yellowknife site also will host a portable science station from Pennsylvania State University that collects ground-based ozone and aerosol measurements, in conjunction with daily launches of balloon-borne instruments planned by Environment Canada and the National Oceanic and Atmospheric Administration.

The ARCTAS flights are being coordinated with research flights being conducted by the French space agency Centre National d'Etudes Spatiales, and the German Aerospace Centre from Kangerlussuaq, Greenland.

The summer deployment of ARCTAS follows a spring deployment based in Fairbanks, Alaska. That mission focused on atmospheric composition, pollution transport pathways, and the formation of "arctic haze," which is fuelled by sunlight that causes chemical reactions in pollutants that accumulate over the winter.

Steve Cole
Headquarters, Washington

Source: NASA homepage on 12 June 2008

3.8 EARTHQUAKE PREDICTION POST-SICHUAN

LinLin Ge and co-workers at the University of New South Wales have mapped the movement of the ground caused by the Sichuan earthquake using space-based radar interferometry. They have been using data from JAXA's PALSAR instrument on board the Diachi satellite, supplied by the Earth Remote Sensing Data Analysis Centre (ERSDAC) in Japan.

The researchers call the technique differential satellite radar interferometry (DinSAR). They have used it to map movement along the entire 300-km earthquake fault .While it is useful to monitor the exact extent of the earthquake, the technology would be even more valuable if it could be used for earthquake prediction. This may be possible.

Earthquakes occur because stress in the Earth's crust is not released. This stress causes the crust to deform immediately preceding the quake. DinSAR is accurate enough to detect this movement.

In Britain, Taiwan and the US, scientists have also been working on the question of whether remote sensing can be used to detect earthquakes. Taiwanese researchers say they have found a close link between electrical disturbances on the edge of the atmosphere and impending quakes on the ground below.

Jann-Yeng Liu from the Centre for Space and Remote Sensing Research in Chung-Li looked at over 100 earthquakes with magnitudes of 5.0 or larger in Taiwan over several decades. The researchers found that almost all of the earthquakes were preceded by distinct electrical disturbances in the ionosphere.

NASA scientists and workers at Surrey Satellite Technology in the UK have proposed a way to use the effect in an earthquake warning system. Stuart Eves, head of business development at the company, told BBC News: 'The evidence suggests we're now crossing the boundary in terms of technology readiness.'

He added: 'What we don't know is how big the effect is and how long-lasting it is before the earthquake.'

NASA's Minoru Frieund developed the scientific theory behind the effect. The idea is that when rocks are compressed – such as when tectonic plates shift – they act like batteries, producing electric currents. When these currents reach the surface, it becomes positively charged. This charge can be strong enough to affect the ionosphere.

Source: ASM homepage on 17 June 2008

3.9 NASA LAUNCHES OCEAN SATELLITE TO KEEP A WEATHER, CLIMATE EYE OPEN

A new NASA-French space agency oceanography satellite was launched from Vandenberg Air Force Base, California., on a globe-circling voyage to continue charting sea level, a vital indicator of global climate change. The mission will return a vast amount of new data that will improve weather, climate and ocean forecasts.

With a thunderous roar and fiery glow, the Ocean Surface Topography Mission/Jason 2 satellite arced through the blackness of an early central coastal California morning at 12:46 a.m.on June 20. PDT, climbing into space atop a Delta II rocket. Fifty-five minutes later, OSTM/Jason 2 separated from the rocket's second stage, and then unfurled its twin sets of solar arrays. Ground controllers successfully acquired the spacecraft's signals. Initial telemetry reports show it to be in excellent health.

"Sea-level measurements from space have come of age," said Michael Freilich, director of the Earth Science Division in NASA's Science Mission Directorate. "Precision measurements from this mission will improve our knowledge of global and regional sea-level changes, and enable more accurate weather, ocean and climate forecasts."

Measurements of sea-surface height, or ocean surface topography, reveal the speed and direction of ocean currents and tell scientists how much of the sun's energy is stored by the ocean. Combining ocean current and heat storage data is key to understanding global climate variations. OSTM/Jason 2's expected lifetime of at least three years will extend into the next decade the continuous record of these data started in 1992 by NASA and the French space agency Centre National d'Etudes Spatiales, or CNES, with the

TOPEX/Poseidon mission. The data collection was continued by the two agencies on Jason 1 in 2001.

The mission culminates more than three decades of research by NASA and CNES in this field. This expertise will be passed on to the world's weather and environmental forecasting agencies, which will be responsible for collecting the data. The involvement of the National Oceanic and Atmospheric Administration (NOAA) and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) as mission partners on OSTM/Jason 2 helps establish this proven research capability as a valuable tool for use in everyday applications.

OSTM/Jason 2's five primary instruments are improved versions of those flying on Jason 1. These technological advances will allow scientists to monitor conditions in ocean coastal regions – home to about half of Earth's population. Compared with Jason 1, OSTM/Jason 2 will have substantially increased accuracy and provide data to within 25 kilometres (15 miles) of coastlines, nearly 50 percent closer to shore than in the past. Such improvements will be welcome news for all those making their living on the sea, from sailors and fishermen to workers in offshore industries. NOAA will use the improved data to better predict hurricane intensity, which is directly affected by the amount of heat stored in the upper ocean.

OSTM/Jason 2 entered orbit about 10 to 15 kilometres (6 to 9 miles) below Jason 1. The new spacecraft will gradually use its thrusters to raise itself into the same 1,336-kilometre (830-mile) orbital altitude as Jason 1 and position itself to follow Jason 1's ground track, orbiting about 60 seconds behind Jason 1. The two spacecraft will fly in formation, making nearly simultaneous measurements for about six months to allow scientists to precisely calibrate OSTM/Jason 2's instruments.

Once cross-calibration is complete, Jason 1 will alter course, adjusting its orbit so that its ground tracks fall midway between those of OSTM/Jason 2. Together, the two spacecraft will double global data coverage. This tandem mission will improve our knowledge of tides in coastal and shallow seas and internal tides in the open ocean, while improving our understanding of ocean currents and eddies.

CNES is providing the OSTM/Jason 2 spacecraft. NASA and CNES jointly are providing the primary payload instruments. NASA's Launch Services Program at the Kennedy Space Center in Florida was responsible for launch management and countdown operations for the Delta II. NASA's Jet Propulsion Laboratory in Pasadena, Calif., manages the mission for NASA's Science Mission Directorate.

Source: NASA homepage on 20 June 2008

3.10 EARTHCARE SATELLITE CONTRACT SIGNED

The European Space Agency and Astrium GmbH have signed a contract worth €263 million to provide the EarthCARE satellite, the sixth Earth Explorer mission of ESA's Living Planet Programme. As prime contractor, Astrium GmbH is responsible for the satellite's design, development and integration.

The contract was signed in Berlin on the occasion of the International Aerospace Exhibition (ILA) by Volker Liebig, ESA's Director of Earth Observation, Evert Dudok, CEO of Astrium Satellites and Uwe Minne, Director of Earth Observation and Science at Astrium GmbH (Friedrichshafen), in the presence of German Chancellor Angela Merkel, ESA Director General Jean-Jacques Dordain and Head of the German Aerospace Centre (DLR) Johann-Dietrich Worner.

Underlining the value of this mission for a better understanding of the Earth system and climate change issues, Volker Liebig stated that "the role of aerosols in cloud formation and the interaction with radiation is not completely understood by science but plays an important role in climate and weather modelling. This is why the EarthCARE proposal was selected".

EarthCARE, ESA's Cloud and Aerosol mission developed in co-operation with JAXA, the Japanese Aerospace Exploration Agency, will address the need for a better understanding of the interactions between cloud, radiative and aerosol processes that play a role in climate regulation.

The EarthCARE mission aims to improve the representation and understanding of the Earth's radiative balance in climate and numerical weather forecast models by

acquiring vertical profiles of clouds and aerosols, as well as the radiances at the top of the atmosphere. Aerosols control cloud properties, while clouds control the production of precipitation and convection influences stratospheric humidity. The observations of EarthCARE will therefore lead to more reliable climate predictions and better weather forecasts through the improved representation of processes involving clouds, aerosol and radiation.

The satellite will weigh about 1.7 tonnes and will be placed in a quasi-polar orbit of 97° inclination at an altitude of about 400 kilometres. Its launch is scheduled for 2013. The four instruments of the payload consist of an Atmospheric Lidar, a Broad-Band Radiometer and a Multi-Spectral Imager developed by ESA, and a Cloud Profiling Radar developed by JAXA This instrument suite has been optimised to provide co-located samples of the state of the atmosphere along the satellite flight track.

Following the successful implementation of the ERS satellites and Envisat, which address Earth science issues of a global nature, Earth Explorers are focused research missions dedicated to specific aspects of our planet's environment carrying onboard leading-edge technologies. They focus on the atmosphere, biosphere, hydrosphere, cryosphere and the Earth's interior, with the overall emphasis on learning more about the interactions between these components and the impact that human activity is having on natural processes.

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Source: ESA homepage on 27 June 2008

3.11 CONTRACT SIGNED FOR ESA'S SENTINEL-3 EARTH OBSERVATION SATELLITE

The European Space Agency and Thales Alenia Space signed a €305 million contract on the 14th of April 2008, to provide the first Sentinel-3 earth observation satellite, devoted to oceanography and land-vegetation monitoring, as part of the European GMES programme. As prime contractor, Thales Alenia Space is responsible for the satellite's design, development and integration.

The contract was signed in Paris by Volker Liebig, ESA Director of Earth Observation, and Pascale Sourisse, President and CEO of Thales Alenia Space, in the presence of Jean-Jacques Dordain, ESA Director General, officials from the European Commission, the French Ministry of Research and Higher Education and Dominique Bussereau, French Secretary of State for Transport at the Ecology, Energy, Sustainable Development & Land Management Ministry.

Underlining the value of this mission for Europe, Volker Liebig commented: "This satellite is an important element of GMES and will enable Europe to observe important ocean parameters".

Global Monitoring for Environment and Security (GMES) aims at delivering environment and security monitoring services and is being led by the European Commission. It is Europe's response to the ever-increasing demands of effective environmental policies and is at the same time the European contribution to the Global Earth Observation System of Systems (GEOSS).

ESA is responsible for the implementation of the GMES Space Component, a package of earth observation missions involving ESA, EU/ESA Member States and other partners. Central elements of this Space Component are the five families of Sentinel missions.

Sentinel-3 will provide crucial data for information services to the European Union and its Member States as part of GMES. The services to be fed data cover areas such as climate change, sustainable development, environmental policies, European civil protection, development aid, humanitarian aid and the European Common Foreign & Security Policy.

The Sentinel-3 mission will produce a consistent, long-term set of remotely-sensed marine and land data for (operational) ocean state analysis, forecasting and service provision. A comprehensive measurement system facilitating global ocean and land observation is required in order

to provide data for advanced numerical forecasting models.

Sentinel-3 will determine parameters such as sea surface topography, sea/land surface temperature, ocean colour and land colour with high-end accuracy and reliability. For this purpose, it carries an advanced radar altimeter and a multi-channel optical imaging instrument.

To achieve near-global coverage and meet all scientific requirements, Sentinel-3 will be placed in a high-inclination, sun-synchronous polar orbit. Near-real-time data processing and delivery will allow operational services to continuously profit from the mission.

ESA carried out the Sentinel-3 definition phase in 2005/6, drawing on an industrial consortium led by Thales Alenia Space. The implementation phase started in autumn 2007 and the launch of the first Sentinel-3 satellite is planned for 2012.

Source: ESA website, 14th April 2008

4. FEATURE ARTICLES

EARSeL´S HISTORY: A PRESENTATION TO THE GENERAL ASSEMBLY

Istanbul, 5 June 2008

Gunnar Østrem

The idea of writing up the history of EARSeL is not a new idea. Already at the meeting in Basel 1995 there was a group of us sitting at the lunch table in the University cafeteria. Both Professor Bodechtel, Professor Cambou and André Lebeau were of the opinion that the history of EARSeL should be written the sooner the better, while we still were able to remember what had taken place in our organization during the first almost 20 years. I remember that Lebeau was very enthusiastic about this idea.

But nothing really happened.

Then, in June 2003, Preben Gudmandsen wrote a letter to 22 individuals who had been particularly active in EARSeL. He asked them to look for historic material, notes, reports etc. and also pictures from meetings etc, and send them in. He also made an application to ESA for financial support to prepare the *History of EARSeL*. André Lebeau gave a strong support to Gudmandsen´s application. But none of these attempts gave any result.

Finally, at the meeting in Dubrownik 2004, it was decided that we should try to write up the History on a voluntary basis and three persons were asked to start this work. The key person was EARSeL´s secretary for 24 years, *Mrs. Madeleine Godefroy*. She had all the archives in Paris, and had been collecting several photographs from various meetings, and had a fantastic memory of almost everything that had happened during these years.

Then *Robin Vaughan*, who had been a Bureau member from 1993 to 2001 was asked to participate as a co-editor, and finally myself, who had been a Bureau member as the Treasurer from the very beginning in 1977 to 1985 also accepted to take part in the Editorial group.

So, we started immediately during the Dubrownik meeting by making interviews with the senior participants there. I had at least three interviews with Preben Gudmandsen who gave a lot of important information from the earlier days. He had, for example, a good memory about activities within ESA before the idea of creating EARSeL was put forward in Lyngby in 1976.

I also remember that Robin Vaughan invited Johann Bodechtel and me for a dinner in the old city of Dubrovnik, where we got a lot of valuable information from Bodechtel´s memory.

But the key person in our work was Madeleine Godefroy, and it was therefore a great loss for our project when she passed away in 2006.

However, Robin and I continued our work, mostly by e-mail and telephone conversations between us. But we had to meet personally to solve certain practical problems, so we got together in Newcastle in the spring of 2007, where we could sit together at a working table. One important issue was to make a selection of which illustrations should be attached to the various chapters. Then we discovered that, although Madeleine had done her best, no pictures were available for the 8 years period between the Guildford meeting in 1984 and the Eger meeting in 1992. Furthermore, for the following 9 year period up to the Paris meeting in 2001, we found only one picture from EARSeL's activities.

But for the pictures we selected at our meeting in Newcastle, I have tried to compose as comprehensive captions as possible, because it was decided at an early stage that all illustrations should be well described, particularly when a picture shows persons who have been active within EARSeL. Only one single illustration shows a Remote Sensing scene, namely the picture on Page 100.

The reason for this is the following: As a principle should every chapter start on a right-hand page, so it happened that page 100 would have been completely blank. In the last minute Professor Uwe Sörgel in Hannover sent me a Radar image to fill up that page!

Many other individuals have assisted us in our work - too many to mention here, but they are mentioned in the Foreword.

Now the book is here – and all those who regularly receive EARSeL newsletter, will receive the book in the mail!

NOSTRUM-DSS – A CONCERTED ACTION FOR WATER MANAGEMENT IN THE MEDITERRANEAN.

C. Giupponi, University of Venice, CMCC, Italy

M. Khawlie, NCSR**,** Lebanon

G. Begni, Cnes, France

Water resources in the Mediterranean basin are scarce. Their repartition between surrounding countries is uneven and has often be a source of tensions in case of trans-boundary resources. In addition, the regional climate change regional scenarios exhibit a *decreasing trend*, while the population growth, the development of industry (including tourism) and agriculture *increases the demand* at regional, national and local scales. Severe shortages and increasing conflicts are to be expected while the current management regimes are at times neither efficient nor sustainable. The need to improve on the current system is paramount, if the *objective of sustainable development* subscribed by partner countries and the EU, and stability in the region, are to be achieved and maintained. The EU supports the development of IWRM (Integrated Water Resources Management) plans, with stronger stakeholders' participation, pro-poor emphasis and gender sensitivity, So, mobilizing science and technology for the achievement of improved governance and planning in the field of *sustainable water management* is urgently needed. *Earth Observation from Space* is among the cutting-edge information sources that can serve such an objective.

Implemented over a period of three years, the FP6 **Nostrum-DSS Co-ordination Action** aims to contribute to the above goal by *establishing a network* between the science, policy, and civil society spheres, by fostering *active involvement of the relevant stakeholders*, and through the development and dissemination of *Best Practices Guidelines* for the design and implementation of DSS (Decision Support Systems) tools for IWRM in the Mediterranean Area. The ultimate aim is to contribute to *bridge the gaps between science and real life*, in order to provide DSS developers with insight into the *language and the needs of policy makers (PMs) and stakeholders*, and subsequently to provide PMs with *effective tools* based on an integrated approach for problem solving in the context of IWRM.

The key objectives of this Co-ordination Action are:

1. To establish *durable links* between scientific institutions, governments, NGOs, SMEs and other stakeholders and improve public awareness on water management;
2. To improve *scientific knowledge* and applied methodologies in IWRM;
3. To promote the *development of suitable DSS tools* built upon real needs of policy making in IWRM.

One of the Work Packages, '**GIS, remote sensing, and statistical information in support of policy making**' (WP4, Leader: NCSR - National Council for Scientific Research, Lebanon), focuses on the assessment and review of data availability and constraints in the Mediterranean area, in order to address policy makers' and local stakeholders' needs. The starting point was National Reports as to the preliminary identification of data availability and constraints. In addition, NCSR carried out a desk survey of relevant information centres and sources in the Mediterranean basin, as well as of relevant past, ongoing and planned projects with a significant component of data collection relevant for water resource management. WP4 aimed also at assessing the data constraints in relation to policy makers' and stakeholders' needs, in order to undertake a feasibility analysis and implementation of users' interfaces developed in response to users' needs. Within the prototyping activities developed by Nostrum-DSS, a RS and GIS meta-database was set up. Remote sensing products proved quite useful, but among others, this work evidenced that "data availability, acquisition and management in the Mediterranean countries is a very difficult task". Such a problem is well known by EARSeL members and has often be quoted as one of the major hindering factors in RS products use.

The **Nostrum-DSS** final results were successfully presented during the "IWRM through coordination, dissemination, and exploitation of research outcomes" Conference held in Larnaca, Cyprus, October 25-27, 2007. In addition and in line with the Co-ordination action objectives; national workshops bringing together scientists and stakeholders took place, such as for instance in Algeria the Oran workshop (January 31, 2008), organized by ARCE (Association de recherché pour le Climat et l'Environnement)

Nostrum-DSS has a strong potential to support and foster the achievement of many EU initiatives and international relation policies, especially with Partner Countries in the Mediterranean through the contribution to the Euro-Mediterranean Partnership. This is a good example of projects of great practical, environmental, strategic and political importance, in which the use of RS cutting-edge products is no longer visible but is of a paramount importance. RS is one of the few – if not the only - source of trans-national information that can be used to build international consensus based upon undisputed evidences.

5. FUTURE EVENTS

5.1 CONFERENCES AND SYMPOSIA

8 – 11 September 2008	10th International Symposium on High Mountain Remote Sensing Cartography Kathmandu, Nepal http://www.icimod-gis.net/HMRSC-X/index.html
9 – 12 September 2008	United Nations / Austrian / European Space Agency Symposium "Space Tools and Solutions for Monitoring the Atmosphere and Land Cover" Graz, Austria http://www.unoosa.org/oosa/SAP/act2008/graz/index.html
16 – 17 September 2008	GMES Forum 2008 Lille, France http://www.intergeo.de
17 – 19 September 2008	Forest Fires 2008 Toledo, Spain http://www.wessex.ac.uk/conferences/2008/fires08/index.html
22 – 24 September 2008	First International Conference on Remote Sensing techniques in Disaster Management and Emergency Response in the Mediterranean Region. Zadar, Croatia http://www.earsel.geosat.hr
22 - 26 September 2008	2nd MERIS/(A)ATSR User Workshop ESA/ESRIN Frascati (Rome), Italy http://earth.esa.int/meris_aatsr_2008/
30 September – 4 October 2008	1st Workshop on Advances in Remote Sensing for Archaeology and Cultural Heritage Management Rome, Italy http://www.ibam.cnr.it/earsel/workshop/Workshop.htm
6 – 8 October 2008	10th International Workshop on Signal Processing for Space Communications (SPSC 2008) Rhodes Island, Greece http://www.congrex.nl/08c07/

13 – 15 October 2008	2nd United Nations International UN-SPIDER Bonn Workshop: “Disaster Management and Space Technology – Bridging the Gap” Bonn, Germany http://www.unspider.org/
27 – 31 October 2008	7th International Conference of the African Association of Remote Sensing of the Environment Accra, Ghana http://www.aarse2008.org
12 – 14 November 2008	Digital Earth Summit on Geoinformatics: Tools for Global Change Research Wissenschaftspark Albert Einstein, Potsdam, Germany http://www.isde-summit-2008.org/front_content.php
26 – 28 November 2008	5th International Symposium on LBS & TeleCartography Salzburg Residence, City of Salzburg, Austria http://www.lbs2008.org
16 – 19 March 2009	EARSeL 6TH SIG Imaging Spectroscopy Workshop: "IMAGING SPECTROSCOPY: An Innovative Tool for Scientific and Commercial Environmental Applications” Ramat Aviv, Tel-Aviv, Israel http://www.earsel6th.tau.ac.il/
15 – 18 June 2009	29th EARSeL Symposium – ”Imagin(e/g) Europe” Chania, Crete, Greece http://earsel29.maich.gr/
16 June 2009	2nd Workshop on Education and Training Chania, Crete, Greece http://earsel29.maich.gr/
19 June 2009	4th Workshop on Remote Sensing of Coastal Zones – ”Coasts and Climate Conflicts” Chania, Crete, Greece http://earsel29.maich.gr/

Back Cover – Participants of the 28th EARSeL Symposium and Workshops in Istanbul, 2-6 June 2008, at the ITU Süleyman Demirel Convention Centre.

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