

1 - Editorial

I am looking back to a successful annual symposium that we have just had in Enschede. I hope those who visited had fruitful discussions with their colleagues. There was everything we needed : good locations, fine weather (actually 'tropical days') and gourmet dinners. A summary of the symposium and the annual meeting is given in this Newsletter. I am already looking forward to next year's meeting in Valladolid (first announcement enclosed). A personal remark concerns the aspect of «operational application» which was the title of the symposium. This subject covers a wide range of topics including financing, data continuity, production and product development, distribution and marketing. After listening to the discussions during the symposium I could not identify any real progress that has been made over the last 5 years (I challenge anyone for a contribution on this matter). The matter definitely is too complicated for very simple conclusions : applications for global environmental studies have quite different stakeholders and objectives than large scale mapping applications which need to be realised in a cost-effective manner. The respective examples are the weather satellite system and the global positioning system. In that respect I still foresee problems with the approach taken by ESA for their Earth Watch Missions for which pre-operational (a.o. cost-effective) application is required. Considering the type and characteristics of sensors that have been proposed so far I do not expect many missions to become operational.

This June issue is again a special issue; the topic is high resolution satellite data. «High resolution» of course is a matter of definition and for this issue it has been defined as data with a ground resolution of less than 10 m. Furthermore, the applied data should come from systems that are running and which will also deliver in the years to come. It therefore excludes the SPOT panchromatic data, declassified DoD data (e.g. CORONA archive) and data e.g. acquired from space stations. In the planning of this issue the EarlyBird system from EarthWatch was on the list – unfortunately communications with this satellite failed after launch. At this moment, only two systems can be considered : IRS-1C, -1D panchromatic data and the digitised data from the KVR-1000 camera (SPIN-2). Two extended contributions on this are given in Chapter 3 of this issue. At the moment we still see very large differences in pricing which indicates that the market is still characterised by a small number of producers and consumers.

Please find enclosed the new EARSeL brochure that has just been printed. It gives an overview of our objectives, activities and contacts. Do not hesitate to ask our Secretary for additional copies for further distribution.

I would like to end by wishing everybody very pleasant summer holidays.

The Editor

2 - News from the Association and its Members

2.1. EARSeL 1998 General Assembly and Symposium

The 18th annual EARSeL symposium was organised jointly with the Netherlands Society for Earth Observation and Geo-Informatics and was held at the International Institute for Aerospace Survey and Earth Sciences (ITC) in Enschede, The Netherlands from 11-13 May 1998.

The Symposium was followed on Thursday, 14th May by two specialist workshops. The first was organised by the ITC in co-operation with Commission VII-7 of ISPRS and covered "Remote Sensing and GIS for non-renewable resources in developing countries", organised by T. Woldai and F. van der Meer. The NSEOG Workshop organised in co-operation with Commission VII-2 of the ISPRS covered "Land use/land cover change : methods and applications".

Together these meetings attracted more than 160 participants, who appreciated the modern facilities offered in the attractive new ITC building and the summer weather, which allowed for most enjoyable social events in the evenings.

Report

Introductory Session

The symposium was opened by Dr. Robin Vaughan, EARSeL Chairman, and a welcome was extended by Dr. Gerard Niewenhuis, Chairman of the Netherlands Society of Earth Observation and Geo-Informatics, the local organiser of the symposium. These were followed by a welcome by the Rector of ITC who gave an overview of the institution. It is directed towards activities related to developing countries with about 50% devoted to education of students from these countries, 25% for research and development and 25% for advisory services. It comprises 15 institutes with students coming from Asia (41.5%), Africa (30%) and Mid-America (10.5%), in total between 400 -

500 students per year of which less than 100 are women. Studies may lead to Masters and Ph. D. degrees, and the activities include education of technicians.

These welcomes were followed by presentations by international organisations (some of them sponsoring EARSel) which we shall briefly review :

In a presentation of the research activities by the EU Commission and DGXII D in particular, Dr. Alan Cross representing Dr. Christian Pateman of DGXII D pointed out that presently EU governments are unwilling to continue support of space technologies to the same degree as before. One result of this is that the 5th Framework Programme for the period 1998 to 2002 does not contain reference to Earth Observation (EO). It comprises 'integrated projects' in which EO may be an element as a tool, however. The content of the programme is still under discussion - also in the European Parliament - and might change in this respect. This also applies to the total budget which presently call for 12 740 MECU of which JRC should receive 688 MECU. It was noted that the programme foresees increased involvement by the DG's of the Commission. The programme will be conducted largely in the same way as before but with the exception that Calls for Proposals will be open continuously throughout the programme.

In reviewing the activities of FAO/UN Dr. Fred Snijders addressed the problems that FAO has encountered in obtaining EO data for support of sustainable development in Africa, for instance. Although EO is considered only one component integrated in geo-information systems the speaker called for satellite data that are suitable for the type of work, is affordable and is obtained in a timely manner. The present policies of data providers are counterproductive in this respect and he referred to EUMETSAT as one example, where data are free only to the Meteorological Institutes in the participating countries. As to timely availability of data, telecommunication tests have been conducted and it was found that presently the local and regional telecommunication systems are far from optimum. Even WWW on Internet is not available in several African countries.

Dr. Guy Duchossois gave an overview of the ESA activities which are really impressive. The two satellites ERS-1 and 2 are still functioning with only some slight degradations which are not hampering the delivery of data as requested. These satellites are remarkable for their stability and the almost continuous flow of data since 1991. Thus, more than 1 350 000 SAR scenes have been acquired by ERS-1 whereas ERS-2 has delivered more than 600 000 SAR scenes. They are the best satellites in this the best of all worlds ! (as Diderot might have expressed it). Almost all land areas are covered from 30 receiving stations. A station in Russia may soon close the gap still existing. This is of importance for the so-called tandem-operations previously and presently undertaken so that digital terrain models may be worked out for all land areas - at a remarkable accuracy. This was one of the many examples of applications of ERS data, including earthquakes/tectonics, volcano monitoring and flood monitoring. The interest for exploiting ERS data is still very great which became clear with the recent ERS AO-3 which resulted in more than 300 proposals from 45 countries. The previous AO's have resulted in more than 6 000 publications of which about 3 000 are dealing with SAR data - Guy reported proudly. Operations have been secured economically until the year 2000, when ENVISAT is planned to be launched. Briefly, he mentioned Meteosat Second Generation which will be launched in October year 2000 and METOP-1 to be launched in 2003 in a morning orbit complementing a US satellite in an afternoon orbit.

Another ESA presentation was given by Dr. Stefano Bruzzi describing ENVISAT instruments and programme. It includes instruments for atmospheric studies and monitoring such as GOMOS, MIPAS and SCIAMACHY in addition to ASAR, MERIS and AATSR, the latter instruments meant for Earth surface observations. Of special interest is the availability of on-board solid-state recorders with a 60 Gb capacity, sufficient for storing 10 minutes of ASAR data, for instance. With ARTEMIS, the geo-stationary data relay satellite in orbit, almost every spot on the Earth may be monitored in almost real time. It is interesting to note that with AATSR we will continue about 15 years of sea surface temperature data of importance for climate change studies.

Steen Hough, also of ESA, described the Data User Support Programme (DUP) which presently includes seven projects carried out jointly with participating states and five which have a bearing on developing countries carried out in co-operation with FAO. The programme is a small one in comparison, which aims at developing analysis techniques with a view to sustainable operation and support of the so-called value-added industry.

Finally, Professor David Southwood described the present situation of ESA with respect to EO activities 'beyond ENVISAT'. It is proposed to change the scheme of EO at ESA with two lines of programmes, Earth Explorer (EEM) and Earth Watch Missions (EWM). A so-called envelope programme will be established so that a series of satellites may be constructed according to a phased plan. With this financing structure missions may be forthcoming every second year according to an agreed plan so that scientists may count on the missions, organised more or less in the same way as in the ESA Science Programme. With the title of this symposium the speaker apparently found it in place to concentrate on the EWM. These missions are optional (as previous ESA EO missions) and require that interested data users and industry get together in defining and financing the mission in partnership with ESA - also financially. Thus, the missions are counting on operational organisations. They could be supported by the so-called 'anchor tenancy' (as exploited in USA), i.e. a user entity that guarantees purchase of a certain volume of data during

the life time of the mission that may involve a series of satellites. Dr. Southwood referred to a recent Call for Proposals issued to get a feeling of what European industry would be interested in providing. 14 proposals were received and are presently being evaluated by ESA. They demonstrate that industry already has considered its role in a future partnership, in several cases based on a national interest. The ESA plan also calls for a dedicated technological development programme that prepares instruments for future missions. The main idea behind these plans is that ESA with its member countries can guarantee a series of satellites according to a long-term plan : 'Risk is Retired' as the speaker expressed it.

The Proceedings of the Symposium will be published by Messrs. Balkema of Rotterdam as in previous years and should be available this autumn. Papers presented in the workshops will be reviewed and published separately.

2.2. EARSeL Bureau and Council meetings

In order not to miss the very full and interesting symposium sessions, the EARSeL Bureau and Council met on Sunday 10th May at the Dish Hotel in Enschede. Apart from the Bureau members, the national representatives of Austria, Belgium, the Czech Republic, Denmark Germany, Hungary, Italy, the Netherlands, Poland, Spain, Switzerland and the United Kingdom were present, as was Dr. J. Mégier, representing the JRC/CEC and Dr. M. Gomasasca representing the Italian Remote Sensing Society (AIR) and Dr. Jim Young, Chairman of The Remote Sensing Society, UK.

The Chairman, Dr. Robin Vaughan, gave an overview of relations with other remote sensing organisations and societies whose activities include a strong remote sensing element, such as the ISPRS, the OEEPE, CERCO and EUROGI. The Vice-Chairman, Prof. Parlow, attended the annual meeting of the latter organisation, which would very much like EARSeL to become a full member. In view of the high membership fee and certain other factors, it was decided that EARSeL should remain as an active observer for another year or so and then re-consider its position. Reports on the activities of the Special Interest Groups were given as outlined below. The Chairman also reported on the latest developments in the STRIM (European Programme on the use of Space Techniques for Major Risks Management) proposal for a training and information system. It is proposed to set up an electronic database on education and training at different levels as a function of type of risk. The second aim is to create a Eurodoctorate in Risk Management in the field of Space Sciences and Technologies. This would be an add-on to a PhD and require the student to work for 3 months in another European State and to undertake an approved course of study to broaden his knowledge. An application was being prepared to submit to the EC under the SOCRATES programme for funding to set up a European Association to administer this. The Secretary-General (Dr. Lucien Wald) informed Council that a new access to EARSeL pages on the Web was being installed via a server at the Ecole des Mines de Paris in Sophia Antipolis, which would be linked to the pages at ESRIN. As a first step the list of members will be entered with links to their Web pages (if they have one), then the SIGs will be listed also with links to their pages, announcements of meetings will be listed and at a later stage the Directory. The address will be : <http://www.earsel.org>

Plans are going ahead to hold the 1999 G.A. and Symposium at the University of Valladolid in Spain from 31st May - 2nd June. This will be followed on 3/4th June by a joint ISPRS/EARSeL two-day technical workshop organised in conjunction with several Commission working groups of ISPRS dealing with various aspects of image interpretation techniques. Prof. M. Buchroithner, former EARSeL Vice-Chairman, extended an invitation to the General Assembly hold the EARSeL General Assembly and Symposium at the University of Dresden in the year 2000 and this was warmly welcomed. Other meetings in which EARSeL will be actively participating include : ISPRS Commission VII ECO BP'98 in Budapest in September 1998 and UNISPACE III to be held 19-30 July 1999. EARSeL will also cooperate with JRC Ispra in the organisation of another MEDCOAST workshop on the "application of remote sensing technology with particular reference to impacts on the coastal zone", to be held in Ispra in the spring of 1999 probably. Within the framework of the STRIM programme, a meeting is also planned on disaster monitoring and mitigation to take place next autumn, either in Paris or Strasbourg. Another meeting in view is another in the series OCEANS FROM SPACE in the year 2000, following on those organised in Venice in 1980 and 1990, in which EARSeL has been invited to co-operate. Dr. Lucien Wald, Secretary-General proposed the creation of an EARSeL award for a scientist up to the age of 45. The laureate would be rewarded for : a) his/her achievements in remote sensing research, b) the usefulness of his/her work to the end user or other scientists, c) his/her work in education and promotion, as well as participation in national and international associations. The jury would need to be composed of representatives from EARSeL, commercial companies and the sponsoring organisations. The award should consist of a Certificate plus a modest financial award in the order of 1000 ECUs. These ideas were welcomed by the Council, who agreed that sponsorship should now be sought. The next EARSeL Council meeting will take place in Paris on 15th January 1999.

New national representative for Italy

Following the resignation of Prof. Vito Cappellini, who had served as national representative for Italy for several years, a new election was held among our Italian member laboratories prior to the General Assembly, when Prof. Sergio Vetrilla of the University of Naples was elected for the period June 1998-June 2000. We currently also invite

the chairmen or their representatives of the national remote sensing organisations to our Council meetings and we had the pleasure of welcoming to our Council meeting held in Enschede Dr. Mario Gomasca, Vice-Chairman of the Italian Remote Sensing Society AIT. In this way our Italian member laboratories are well represented and we look forward to close co-operation.

2.3. Data Fusion SIG conference

2nd International Conference «Fusion of Earth Data, merging point measurements, raster maps and remotely sensed images», Sophia Antipolis, France, January 28 – 30 1998. Meeting Sponsors : EARSeL, Ecoles des Mines de Paris, Société des Electriciens de France (SEE).

Report by Duncan C. Munro, Western European Union Satellite Centre

«Fusion of Earth Data, merging point measurements, raster maps and remotely sensed images» drew together 58 researchers and practitioners to exchange views on the theory and practice of using disparate data sources to provide solutions to problems. Representation from academic, governmental and commercial fields ensured a lively discussion of both philosophical and technical aspects of the collection and analysis of data that addressed a diverse range of questions.

The meeting commenced with a warm welcome to the beautiful Cote d'Azur, France and a review of the goals of the EARSeL Special Interest Group on Data Fusion by the meeting organisers Dr. Lucien Wald, Ecole de Mines, Sofia Antipolis, Dr. Robin Vaughan, University of Dundee and Dr. Jean-Pierre Damiano, SEE, France. This years meeting the second in a biannual series sponsored by EARSeL provided participants an opportunity to review progress made since the inaugural meeting in 1996 and to focus on the difficulties that a rapidly expanding methodology faces. To this end the meeting commenced with a session to highlight the definitions of data fusion and its semantics. The need for a documented and agreed terminology for Data Fusion became clear as the range of words used to describe very similar approaches to image and data analysis was outlined. The consequences of applying multiple terms to one process or technique were evident throughout the meeting as successive authors confessed that their choice of vocabulary had been somewhat arbitrary.

Following the opening session the remainder of the 9 oral and poster sessions focussed on practical implementations of Data Fusion. An excellent range of topics was covered treating many aspects of research design and implementation as well as demonstration of practical approaches to real-world problems dependent on Data Fusion. Evidence of the expansion in remotely sensed data sources was seen in the range of pixel sizes (6 metres – 1 km) spectral resolutions (panchromatic – hyperspectral) and wavelength regions (visible - microwave) that are now being integrated in the context of data fusion. In addition non-image data sources (e.g. population surveys, rainfall samples, forest-stand composition descriptors) were highlighted in many talks emphasising that issues related to temporal and spatial resolution should not be considered only under the constraints of orbital technology.

In addition to the diversity of topics the meeting also benefited from a diversity of expertise. Information scientists were able to demonstrate the ways in which mathematics can provide a quantitative framework for information analysis, whilst in parallel the image processing software developers showed how processing chains for multiple image datasets can be created and implemented. Foresters and meteorologists illustrated how the results of Data Fusion can be incorporated into a decision making process by careful consideration of the fidelity of the results and management of the practical aspects of data collection and analysis.

The meeting provoked many discussions as to what level of acceptance and implementation, the methodologies of Data Fusion developed in a research environment, have achieved in governmental and commercial organisations. Viewing the subject from within the operational constraints of the Western European Union Satellite Centre it was valuable to observe that the progress being made in implementation within a daily schedule is close to that being made at a research level. The need for operational organisations to keep moving at a similar pace to technological developments is a difficult challenge to meet and the conference showed that the approach to scheduling technology evaluation and implementation phases in the Western European Union Satellite Centre has been successful. The need for both academic, governmental and commercial entities to exchange views was clear and to perhaps there is an educational requirement to bridge the gap between the researcher understanding the nature and consequences of Data Fusion algorithms and methodologies and the practitioner, be they Urban Planner, Epidemiologist or Geomorphologist. The rapid evolution of the computational component of Data Fusion both in terms of algorithmic complexity and speed of implementation appears to be outpacing the development of new applications for the products. Addressing this imbalance will require the integration of more applications-oriented effort within the technical framework.

The proceedings of this conference have been edited by Thierry Ranchin and Lucien Wald and are published by SEE/URISCA, Nice, France.

A next data fusion workshop will be held in conjunction with the EARSeL Annual Symposium in Valladolid on 3 and 4 June 1999 and co-organised by EARSeL and ISPRS.

The 2nd International conference on "Fusion of Earth Data" will be held in Sophia Antipolis, 26-28 January 2000.

Authors' Award

Lucien Wald, Thierry Ranchin (Ecole des Mines) and Marc Mangolini (Aerospatiale) have received the 1997 Award of Autometric Inc., USA, for their article : Fusion of satellite images of different spatial resolutions : assessing the quality of resulting images. Photogrammetric Engineering & Remote Sensing, 63, 691-699, 1997. This paper sets out the three properties necessary for the construction of images of improved resolution. It reviews the means already available to check whether a product obeys these properties, and shows that none is currently satisfactory. A solution is then proposed, which is illustrated through the merging of SPOT-XS and -P images. Three different known methods were applied for the fusion. Our solution allowed to assess the quality of each resulting product and permits the selection of the most appropriate. The assumptions underlying this solution are finally discussed. This work was partly presented in the conference "Fusion of Earth Data" held in 1996, during which the EARSeL Data Fusion SIG was created. The work described has been further improved benefiting from fruitful discussions and exchanges within the SIG. The award thus acknowledges the high quality of the work carried out in Europe in data fusion, especially through the EARSeL SIG.

2.4. Imaging Spectroscopy SIG Workshop

The SIG on Imaging Spectroscopy has planned a Workshop at the University of Zurich (CH) from 6-8 October 1998. More than 70 abstracts have been received with inputs not only from Europe but also from the USA, Canada and Australia. The preliminary programme will be drawn up shortly and distributed to all members.

The plenary and poster sessions as well as round table discussions will give participants the opportunity to present their latest results on the following topics :

- * Atmospheric applications;
- * Limnological applications;
- * Geologic applications;
- * Monitoring of vegetation;
- * Urban and other applications;
- * Operational use of imaging spectrometers;
- * Hyperspectral data interpretation, integration with other types of sensors;
- * Pre-processing, calibration and validation of hyperspectral data
- * New instruments and techniques

Details concerning the Preliminary Programme may be obtained from : Michael Schaepman Remote Sensing Laboratories, University of Zurich, Winterthurerstrasse 190, CH-8057 Zurich, CH Tel : +41 1 635 51 45; Fax : +41 1 635 68 46 or 68 48; e-mail : schaep@geo.unizh.ch

2.5. Forest Fires SIG technical meeting

The 3rd International Conference on Forest Fire Research will be held from 16-20 November 1998 at Grande Hotel das Termas, in Luso, Coimbra. Luso is a thermal resort situated 20 Km North of Coimbra in Central Portugal, and is well connected by road and train to Lisbon (220 Km) and Oporto (80 km). The Conference will cover areas related to fire weather, fire behaviour, fire ecology, fire management, human and institutional factors.

Taking advantage of the 3rd. International Conference on Forest Fire Research, the Special Interest Group on Remote Sensing and Forest fires (RSFF-SIG) will organise a technical meeting on the Saturday 21st, just after the conference. This short meeting will be an opportunity to review the current state of research in remote sensing analysis of forest fires, bringing active experts on this topic to exchange ideas and promote collaboration. Scientists intending to present papers should send the abstracts to the organisers of the 3rd international conference, since this seminar will be structured in technical discussions. Three keynote speeches will be addressed, summing up some controversial issues in the field of fire risk assessment, fire detection and burned land mapping. A draft schedule for the RSFF-SIG meeting follows :

- 09.00 : Presentation of participants
- 09.30 : Current topics in fire risk assessment
- 10.15 : Discussion on fire risk assessment issues
- 11.00 : Coffee break

11.30 : Current topics in fire detection
12.15 : Discussion on fire detection issues
13.00 : Lunch
14.30 : Current topics in burned land mapping
15.15 : Discussion on burned land mapping issues
16.00 : Informal proposals for future projects on remote sensing of forest fires

The technical co-ordinator of this meeting will be Dr. Emilio Chuvieco, co-ordinator of the EARSeL RSFF-SIG. Although, as said before, no papers will be delivered at this meeting, scientists intending to contribute to the technical discussions may send a 1-2 page abstract with information relevant to the discussions. These abstracts will be copied and distributed to the participants. A small fee to cover meals and room rental will be required.

Further information may be obtained from :

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Additional information can be obtained from the Chairman of this Conference : Prof. Domingos X. Viegas, ADAI, Apartado 3131, 3000 Coimbra, Portugal. Tel. (39) 7000732. Fax. (39) 7000771. E-mail : dxvuc@gemini.ci.uc.pt.

2.6 Obituary - Dr. Roberto Pereira da Cunha

We have recently learned of the death at the early age of 48 of Dr. Roberto Pereira da Cunha who, as President of Commission VII of ISPRS from 1992 to 1996, was well-known to many EARSeL members. At the National Institute of Space Research (INPE) in Brazil, where he worked for almost 22 years, he was head of the Remote Sensing Division. He was also President of SELPER (the Society of Latin American Specialists in Remote Sensing) for several years and was Coordinator for Institutional Relations - National and International Cooperation (since 1991). He published many scientific papers and organised numerous national and international congresses related to the environment and remote sensing.

EARSeL maintained very cordial relations with Dr. Pereira da Cunha and we should like to extend our deepest sympathy to his family and many colleagues.