# content



**2002** number 1

# introduction

With the needs of our alumni uppermost in our mind, we are always trying to improve *ITC News*. At the reception organised for alumni during the AfricaGIS conference last November, 60 alumni filled out a questionnaire prepared by ITC to test the water in this respect.

One of the questions was "Which extra item(s) would you like to see included in *ITC News*?". Research-oriented news was a frequent reply. That's why from now on we will report on PhD promotions at ITC, starting with Mr John Carranza's promotion on 4 February (page 22-23). We will also stimulate ITC staff to report about ongoing research they're engaged in. Dr Dunn of the University of Durham, UK, Dr Horton of the International Service for National Agricultural Research, the Netherlands, and Mr Peel of the Range and Forage Institute, South Africa, have all delivered guest lectures during the ITC Wednesday afternoon research seminars, and they have been kind enough to write artices for this issue of *ITC News*.

News about alumni - what they are doing now in their home countries and how to reach them - was also something that alumni would like to see included. In our Strategic Plan 2001-2004 one of the aims is to develop stronger relationships with our alumni; we will keep you informed on progress via *ITC News*. Until then you can keep in touch with your fellow alumni through the column "Life after ITC". Maybe this is also the time to check out the list of alumni associations on pages 31-32. It's been completely updated and some alumni associations have been added to the list.

As from this issue greater attention will be given to the conference calendar (page 33). Not only are more conferences mentioned but you can also see who will be representing ITC. This will give you the opportunity to meet up with ITC staff when attending the same conference.

Another new paragraph is "Staff News" (page 10). Here we plan to keep you up to date with changes within the Institute, new staff arriving and familiar names leaving. As you can see, this year we will say goodbye to three of our professors, Profs Wolfgang Kainz, Paul Driessen and Andrea Fabbri, as well as to our research coordinator, Dr Elisabeth Kosters.

As always, your opinion about *ITC News* and the topics it should cover is most welcome.

*Janneke Kalf, Acting Managing Editor*

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The views expressed by the contributors do not necessarily reflect those of ITC

STRATEGIC PLAN 2000 - 2004

# The Decentralisation of Education

**An interview with Sjaak Beerens, Director External Affairs** beerens@itc.nl

**by Janneke Kalf, Acting Managing Editor** kalf@itc.nl

***Last December 2001, at the Dies Natalis, the ITC Directorate launched the Strategic Plan 2001-2004 with an interesting panel discussion on ITC's strategy of decentralising part of its educational programme to the countries of origin of ITC's course participants. Your editor-in-chief interviewed Sjaak Beerens, Director External Affairs, who has the implementation of this decentralisation strategy in his portfolio.***

*Decentralisation features rather prominently in the Strategic Plan 2001-2004. What do you actually mean by "decentralisation"?*
"Decentralisation" refers to transferring the execution of part of ITC's educational programmes to the countries or regions of origin of our course participants. It will involve engaging in partnership arrangements with reputable qualified (and preferably) educational organisations, such as national universities in the developing world. The "decentralised" parts of the ITC educational programmes will be executed in collaboration with, and in principle by, staff members of our partner organisations.

For example, our decentralised educational programme in Iran has been implemented in close collaboration with a national university and a research organisation. It comprises both a Professional Master (PM) stream and a Master of Science (MSc) stream. The 12-month PM programme is executed entirely in Iran; as for the MSc programme, 12 months are spent in Iran but the thesis writing takes place at ITC in Enschede.

*Why does ITC consider this to be so important?*
We have noticed over the past couple of years that mid-career professionals, people between 30 and 40 years of age, have difficulty in leaving their work and family for an extended period of time. Their employers do not like to see them leave for such a long period. Nor do potential course participants themselves like the idea of leaving their families behind for such a long period - it is becoming increasingly difficult and expensive to take family members, spouse and children, to the Netherlands.

In other words, we observe a slow but undeniable decline in the number of applications for our programmes. In discussions with client organisations and potential course participants, we are regularly confronted with apprehensiveness regarding the duration of absence.

*Is that the only reason for ITC to embark on a strategy of transferring part of the educational programmes away from Enschede in the Netherlands?*
No, there are a number of other reasons. First of all we should not forget that capacity and capability at national educational and training organisations in many developing countries have drastically improved. We see many national organisations in the developing world that offer a variety of training and educational programmes, in many cases executed by ITC alumni. Let's face it and be proud of it as well; ITC would have done a very poor job, if after more than 50 years and almost 15,000 alumni, capacity in the developing world to organise training and education programmes had not im-

proved. As a matter of fact we observe a steady increase in competition - if we may use that word.

Moreover we have to deal with changes in development cooperation policy. The Dutch government, i.e. the Ministry for Development Cooperation, has undertaken some drastic changes in its development cooperation policy. We observe that decision making on the spending of development aid is shifting from the north to the south, which means we must move as well if we want to be part of that in future.

*The reasons are clear, accommodating the changes in demand from the side of client groups, increased training and education capacity in the developing world and a change in policy. But is decentralisation the only way to address these changes?*
No, definitely not! We consider decentralisation to be only one of the elements to address the changing demand for our educational services. We see also a clear need for spreading the programme over a longer period - to allow part-time education and to allow individuals to accumulate the credits required for a degree over a longer period, and perhaps even from different organisations.

Even more important is the increased need for distance education, allowing people to do part of the programmes at home or at their office through Internet. We are in the process of developing a comprehensive educational set-up, integrating decentralisation supported by distance education, which allows participants to spread the course programme over a longer period.


*But hasn't ITC been involved in the decentralisation of its education since the 1960s, when it started with strengthening the education and training capacities and capabilities inIndia, later followed by Colombia, Indonesia, China and Nigeria?*
You are correct in stating that since the 1960s ITC has been providing support to organisations worldwide in order to strengthen their capacity and capability to provide education and training in our knowledge field (nowadays referred to as earth observation and geo-information science). In this way ITC has transferred most of its education and training at technician and technologist levels to the home countries of our course participants.

The major difference is that activities in the past were directed towards strengthening capabilities with the intention of having training and education organised independently of ITC accredited by national organisations. They were based mainly on project funding, with ITC and local partners terminating their relationships on project completion. We have noticed that, although many education and training organisations may have had the capacity and capability to provide training and education, they did not have the capacity and/or resources to maintain and develop that capability.

Under "decentralisation" the collaboration is based on the principle of accreditation by both ITC and the national partner organisation. In other words the degree/diploma eventually obtained by participating in a decentralised programme will have the logos of the national organisations *and* ITC. Such partnerships are assumed to be permanent, independent of project funding, and based on tuition and course fees.

*How will ITC go about implementing this decentralisation policy? Have partners been identified already or can interested partners approach ITC to express their interest in becoming a partner in decentralisation?*
We are in the process right now of identifying partners as well as being approached by those wishing to become partners in this strategy. First of all we are in consultation with current partners in our institutional development projects, some 20 across the world. These institutional development

ITC's decentralised educational programme in Iran has been implemented in close collaboration with a national university and a research organisation.


projects are aimed at strengthening the capacity and capability of national organisations to conduct training and educational programmes - this includes curriculum design, programme formulation and strengthening staff capacity. This has also allowed both national partners and ITC to experience and get to know one another's strengths and weaknesses, which is generally appreciated as a solid basis for collaboration in decentralised education.

Both partners in a decentralised scheme apply the following criteria:

- agreement on the principle of acting jointly, with joint responsibility for preparation and execution
- assessment of the market need, both nationally and regionally, for certain education themes
- legal basis for joint programmes - some countries do not permit joint logo degrees/diplomas, in which case double diploma/degrees may be considered
- capacity and capability available at both ITC and the national organisation for preparing and executing joint educational programmes
- funding opportunities for such programmes, in principle from own subsidy resources and additional tuition and course fees.

Our experience with the first decentralisation pilots in Bolivia, Egypt and Iran has revealed that it is much more convenient to copy programmes that are being implemented at ITC rather than to develop entirely new programmes. The investment in time and money required for developing totally new programmes can be prohibitive.

*Does ITC envisage having a worldwide network of decentralisation partners in the future?*

To avoid overextending ourselves, we will initially limit the number of partners to about 20 by the year 2010. We have to be careful not to bite off more than we can chew. Quality remains one of the more important pre-conditions in this strategy. We are more interested in maintaining quality than in increasing numbers of course participants. We want to avoid a situation faced by some internationally recognised Western universities, who started franchising their courses indiscriminately, without looking at quality, eventually jeopardising their good name and reputation. We understand that it is much easier to lose a reputation than to build one.

"Decentralisation" refers to transferring the execution of part of ITC's educational programmes to the countries or regions of origin of our course participants.

*How will the quality of the education be guaranteed?*
Well, first of all "quality" will be the joint responsibility of both partners in a decentralisation scheme. It is not the responsibility of ITC alone. Following guidelines and criteria applicable to both partners, ITC and the national partner will set quality standards. There will be continuous control of quality following jointly agreed examinations. Some of the examinations, in principle the most important and the final examinations, will be done by staff of both ITC and the national partner.

Regular staff exchange, allowing ITC staff to participate in the decentralised components of the programmes and staff of partner organisations to participate in the lecturing at ITC, will also contribute to quality assurance. Finally, regular independent external reviews and assessments will constitute additional quality control measures.

*Does decentralisation mean that ITC staff will have to travel across the world to give lectures?*
The answer is a clear "NO". That would make the education rather expensive - something we intend to avoid. It is our intention that lecturing staff of our partner organisations will provide the education outside of Enschede. These staff members may be ITC alumni or staff who have been to ITC to prepare, jointly with an ITC staff member, a lecture. Initially, in the start-up phase of a decentralisation scheme, ITC staff members may be on hand to provide support to national lecturing staff. Eventually ITC staff members will only be expected to occasionally introduce new topics or to consult with national staff on quality control aspects, such as joint examinations.

*What are the first reactions to, and experiences with ITC's policy of decentralisation?*
Thus far we have had many positive reactions from our client organisations. The interest in these programmes is substantive - reportedly because it better suits the personal conditions of course participants. This does not only apply to participants from the countries concerned. The JIK Programme (see *ITC News* 2001-2), in which we are collaborating with partners in Iran, has attracted participants from Sudan and as far afield as Ghana.

We have noticed that in some cases people assume that they will do their entire course programme in their home country; this is disappointing for some as they expect to go abroad as well. We do, however, emphasise the need for part of the programme to be conducted outside the home country. In ITC's experience, which stretches back over more than 50 years, course participants generally gain considerable experience from exchanging ideas and views with participants from other countries. We attach great value to this principle, perhaps the basic principle of "international education" as we perceive it at ITC.

# Educational Review by the External Members of the Scientific Council

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***On 29 and 30 January this year, the external members of the Scientific Council, responsible for the quality of ITC's educational programmes and quality control procedures, carried out an internal review at the request of the ITC Directorate. The purpose was to assess how well the new programmes had been implemented and to what extent the objectives of the educational reform were being achieved.***

### History

ITC started to implement a new educational set-up in September 1999. Fundamental changes were needed to meet the changing demands of client organisations and to make more efficient use of ITC staff. Two international review committees on education (in 1993 and 1996-1997) recommended a number of changes necessary to improve ITC's programmes and management of education. These recommendations formed the basis of the change in set-up.

ITC responded to these recommendations and to future demands by restructuring the educational set-up into six programmes with a number of specialisations, based on a modular structure and with a core curriculum on remote sensing and GIS. Moreover, the management structure of education was modified.

### Review Process

The internal review was carried out by Prof. Kroonenberg (Technical University Delft), Prof. Apers (University of Twente), Prof. Ormeling (Utrecht University) and Prof. de Jong (Utrecht University).

The review committee received information from two main sources. Most important were the meetings with staff, students and management, but in addition specific information relating to course structure, the outcomes of evaluations, curriculum design efforts, etc. was collated for each programme and made available to the committee.

### Outcome

The committee stated in its report that "the overall impression we got during this review is definitely very positive, and we see the future of ITC in good hands". According to the committee, considerable progress had been


The committe recommended a.o. decentralisation of education to a limited number of countries









achieved through the structuring of the six programmes, the introduction of the modular system and the core curriculum. Furthermore, improvements had been made at organisational level.

Certain aspects to be taken into consideration were presented by the committee as a list of recommendations and were meant to support ITC's Directorate and staff in consolidating the progress made so far, by fine-tuning the implementation and countering unintended negative effects. The most important recommendations related to:

- the status, objectives, duration and titles of the PM and MSc streams
- the possible transfer of part of the programmes (i.e. core modules) to students' home countries
- pre-selection procedures regarding students for the PM and MSc streams
- the examination of individual final assignments and theses and their relation to research and consultancy
- inter-programme coordination
- number of specialisations
- staff development
- further investments in ICT for educational purposes
- an ITC-wide system of evaluation
- feedback on the performance of lecturers
- distance education using electronic learning environments such as Blackboard
- decentralisation of education to a limited number of countries
- striving for Dutch accreditation (eventually combined with accreditation by foreign institutes)
- ITC's visibility and attractiveness to prospective students in the Western world.

In conclusion we can say that the internal review will prove instrumental in achieving further improvement in the quality and efficiency of education at ITC. Both students and staff highly appreciated the time invested by the committee members.

The outcome of this review will be taken into consideration and translated into an operational plan of improvement as preparation for the accreditation process and for the related external review expected at the end of 2003.

# The Schermerhorn Lounge: Life Begins at ...

**ITC's Common Room**

edith.howard@itc.nl

***My earliest recollections are of growing up in Delft around the mid-1950s, a time when there were lots of new beginnings. I was known simply as the "Common Room".***

How I was in the 1970s.....

I had a beautiful and quite unique wooden floor, which was kept nicely polished, and I can honestly say I was the envy of many more prestigious buildings. A large concert piano was ever present and afforded a welcome diversion for some of the guests who stayed at my home.

Home was Kanaalweg 3, tucked in nicely between the Geodesy Department of Delft University, the Department of Public Works and a lovely botanical garden. Our building was well ahead of its time, not only in looks but also because it was multipurpose and housed multicultural occupants. We were occupied by a large family, and served as an educational institute and a sort of boarding house for students with strange-sounding names, who came from parts of the world I'd never even heard of.

But let's concentrate on me for a while. In the early days people playing table tennis subjected me to endless torture day and night. There were two tables,

which were almost always in use when there were no lectures. I am not complaining; this was more exciting than the occasional lecture by some visitor or staff member who found it necessary to lecture to a large group of students … and me along with them!

On the lighter side I hosted parties. These were not open to everybody, as ladies needed a special invitation to attend. The dean of students, Mrs. Spanjaard, and the boss himself, Prof. Schermerhorn, rigidly enforced this - they even had a "black list" of ladies not allowed to attend. In those days nearly all of the students were men. At these parties I witnessed the beginning of many love affairs and, sadly, sometimes the end of others. Oh, the good old days!

I hosted royalty, many an ambassador, piano recitals, practice sessions, course introductions and graduation ceremonies. But one of my recurring highlights was when St Nicolas and his black Pieters came to visit. Some of the children enjoyed it immensely, while others were scared stiff - as were some of the staff and members of the Board of Governors who were sometimes called by St Nicolas to give an account of what they had been doing during the year.

I was forced to leave home in 1971 and led a sort of hillbilly existence for a few years until I moved in with my mother in her new home in Enschede. My parents separated when they moved to Enschede but ironically enough lived quite close to each other.

Father looked after the students' education and mum made sure they were adequately housed. As quite often happens in such a split, it's the kids who suffer.

At first I was quite a nice room, with a TV, table tennis, billiards etc. However, in the early '90s my friends and I had to give way to some commercial activities, to ensure that we could make ends meet. I forgot to mention that our family and the number of students increased quite a lot after we moved to Enschede but I missed some of the things I'd grown accustomed to. I was given my own bar and had many a "happy hour" on Friday evenings. "Thank God it's Friday" seemed to be the slogan for a long time.

My new stepfather shifted me from pillar to post and I eventually became known as the "SIC room". It was about this time that I also began to serve as a regular venue for church services. There were still the parties but these were not as classy as they used to be, although maybe a lot livelier. Just look at how they are dressed now, no suits or lovely dresses, and don't even talk about invitations - these are things of the past. Ah well, it may all be for the best.

But all is not lost. Good news and at, let's say, 50 (a lady's age is her secret) I am not ashamed to admit that I've had some major surgery. Result? I look terrific - stunning may be a better description - and I feel great. I also have a new name more in keeping with the 21st century and, what's more, one that my guests have given to me. They held a competition to come up with a new name. Talk about appreciation.

So you haven't seen me yet? Don't be shy, pay me a visit; I enjoy having visitors, always have and always will. Just ask for the "Schermerhorn Lounge". Ah, you've noticed … back to my roots. My friends call me the "Lounge" and everybody knows where to find me. See you soon? I'm looking forward to it. You won't be disappointed.

.....and how I look now after some major surgery!

# visiting ITC

## Panama's Minister of Environment Visits ITC

Sjaak Beerens beerens@itc.nl

On Friday, 23 November 2001, Panama's Minister of Environment, ITC alumnus Ing. Ricardo R. Anguizola, visited ITC. Ing. Anguizola studied photogrammetry at ITC in the period 1978 to 1980 and after returning to Panama advanced his career to become *Administrador General of the Autoridad Nacional del Ambiente.*

Ing. Ricardo R. Anguizola, Administrador General of the Autoridad Nacional del Ambiente, accompanied by his wife, meeting his former supervisors Dr Klaus Tempfli and Dr Theo Bouloucos

Besides staff and a representative of the General Consulate of Panama, Ing. Anguizola was accompanied by his wife, whom he married in Enschede during his studies in the Netherlands.

In addition to environmental issues, the Autoridad Nacional del Ambiente is also responsible for establishing and coordinating a national geospatial data infrastructure (NSDI), for which Ing. Anguizola was seeking support from his *alma mater* in terms of technical advice and capacity building.

# Staff news

| | | |
|---|---|---|
| ***Welcome new staff*** | Esther Hondebrink | Secretary, Forest Sciences and Soil Sciences departments, (per 9 February 2002). E-mail: hondebrink@itc.nl |
| | Ard Kosters | Information Technology department, sector CAI (per 1 February 2002). E-mail: akosters@itc.nl |
| | Sabine Maresch | Project Officer, Bureau Project Services (per 1 February 2002). E-mail: maresch@itc.nl |
| | Marleen Noomen | AIO, Earth Systems Analysis department (per 9 January 2002). E-mail: noomen@itc.nl |
| | Emke Smit | Secretary, Facility Management department (per 19 January 2002). E-mail: smit@itc.nl |
| ***Staff leaving*** | Ad Bakker | Director, ITC Hospitality Services (per 1 April 2002) |
| | Prof.dr.ir. Paul Driessen | Professor in Modelling in Quantified Land Evaluation, Agriculture, Conservation and Environment department (per 1 June 2002) |
| | Prof.dr. Andrea Fabbri | Head of the Geological Survey department (per 1 April 2002) |
| | Prof.dr. Wolfgang Kainz | Head of the Geoinformatics, Spatial Information Theory and Applied Computer Science department (per 6 April 2002) |
| | Dr. Elisabeth Kosters | Research Coordinator (per 1 June 2002) |
| | Yvonne van Spanje-van Praag | Mail, Directorate (per 4 May 2002) |

# announcements

## Skeleton Out of the Closet

Janice Collins indigeny@hetnet.nl


Prof. Isaak Zonneveld


Dr Dick van der Zee

An attentive audience gathered in the ITC auditorium on 20 February to witness the official launch of *Landscape Ecology Applied in Land Evaluation, Development and Conservation: Some Worldwide Selected Examples*, a book edited by Prof. Isaak Zonneveld and Dr Dick van der Zee. After a few words of welcome to open the seminar, ITC's research coordinator Elisabeth Kosters went on to say that, while a new function was often accompanied by a few skeletons in the closet, here was one skeleton she'd been more than happy to find and indeed fund. This book marked not only the successful conclusion of a cooperative effort between ITC and the International Association of Landscape Ecology (IALE) but also the end of an era. Costs were now such that ITC would no longer be publishing books itself.

### Land(scape) Ecology: A Base for Survey and Land Evaluation

What's in a name? Quite a bit, as Prof. Zonneveld took some pains to explain. Coined in the mid-1960s and derived via a somewhat tortuous route from the German word *Landschaft*, the term "landscape ecology" initially raised a few eyebrows among ITC students from the developing countries. It was considered to have capitalist overtones. Interestingly enough it appealed to students from China and Japan, who keenly awaited a course on aesthetics and landscape painting! However, the transdisciplinary nature of landscape ecology was the crux of the issue and this could be summed up as "the correlative complex of relations at the Earth's surface, embracing soils, agricultural applications, geomorphology, hydrology, etc."

As far as the new book was concerned, the brief was to compile a collection of papers illustrating how landscape ecology could be applied in developing countries and in various fields. A wide range of topics then, but Prof. Zonneveld singled out the paper on ibex in the European Alps for special mention. This paper was based on the PhD data of Gerbrandt Wiersema, who tragically died in 1985 following an accident in the mountains.

### Role of the IALE

It fell to Dr Rob Jongman, the IALE treasurer, to enlighten the audience on the work of the association. Referring to the Three Gorges Dam, a project that involved the mass relocation of people and raised important questions, he said that the IALE encouraged the use of interactive tools to transcend boundaries at both local and global scales.

Ecology, hydrology and economics, together with cultural, planning and policy aspects, all have a part to play in increasing ecological and economic sustainability. To spread this message, the association organises congresses and workshops, maintains a website, publishes a bulletin six times a year and has compiled a directory to facilitate communication and access to expertise. Currently the association is reviewing the education sector: what courses and exchange programmes are on offer and where, and whether they are given in English.

### Landscape Ecology at ITC

Interactivity was a recurring theme as Prof. Andrew Skidmore sketched the development of landscape ecology as a discipline at ITC. With the advent of re-

Dr van der Zee presented the first official copy of the book to ITC Director External Affairs Sjaak Beerens

Prof. Zonneveld presented the second official copy of the book to the IALE treasurer Dr Rob Jongman

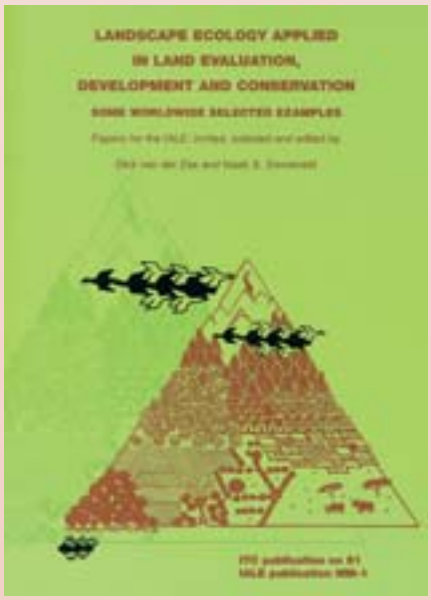
mote sensing, effective methods were now available for both spatially and temporally continuous monitoring of land cover and land use. Consequently we could study how the landscape changes over time, both the processes and the responses. For example, an increase in agricultural land use could lead, and in fact had already led in certain circumstances to a serious decline in wildlife. Tangible products included useful maps of food shortages/surpluses, cereal products and crop yield gaps - there could be incredible variance in production over short distances.

### The Making of the Book

From conception to publication - a long haul and particularly so in this instance, as Dr van der Zee explained. Conception dated back to the early 1990s, although ideas and titles were naturally subject to changes along the way. Invitations to contribute were originally addressed to 150 ITC alumni. Then it was down to sifting the replies, reviewing, making comments and improvements, sending reminders, linguistic editing and formatting in line with print specifications - activities that had to jostle for attention between the busy travel schedules and normal work commitments of the editors. Not only that, until ITC gave the green light, the process had been dogged by the thorny problem of finding an affordable publisher.

A daunting task but successfully accomplished as Dr van der Zee presented the first official copy of *Landscape Ecology Applied in Land Evaluation, Development and Conservation* to ITC Director External Affairs Sjaak Beerens. Congratulating the editors on a job well done, he observed that the book was a reflection of the scope, mission and spirit of ITC … moreover, the skeleton was now remarkably well-dressed! It was then the turn of Prof. Zonneveld to present the second official copy to Dr Jongman who, while thanking the editors for their hard work, consigned publisher problems to the past with the news that in future the IALE would be collaborating with Cambridge University Press.

Copies of the new publication, sporting a smart green jacket, are now on the shelves of the ITC Bookshop. Alas, the opportunity to obtain copies autographed by the two editors was limited to those present in the auditorium!




Copies of Landscape Ecology Applied in Land Evaluation, Development and Conservation by Dr Dick van der Zee and Prof Isaac Zonneveld are available from the ITC Bookshop.

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Price: Euro 36.50 (excluding mailing costs),

Publication number: 81

## ESRI Internships for ITC Students

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**Each year ESRI Redlands (California) offers ITC students internships of three, six and 12 months' duration, to a total of 24 months. The goal of these internships is to turn ITC graduates into even better prepared professionals for their jobs at home.**

Yongiun Zhao one of the nominees for an ESRI internship here at her MSc-graduation ceremony

During the two weeks in early March leading to the MSc graduation ceremonies of our educational programmes, the selection committee of the ESRI International Internship Program met on various occasions to shortlist three or four nominees from the 15 applications that had been received. The level of the applicants - as well as that of the extensive documentation they had provided - was beyond the committee's expectations, which led to a difficult though pleasant selection process.

All the documents were circulated for 10 days among the committee members, Lorena Montoya, Lyande Eelderink, Mohammed Said, Boudewijn de Smeth and Rolf de By, and a blind voting scheme was applied. After this, a pre-selection was made. A surprising amount of consensus had already been reached by this time, leaving seven candidates in the race. The committee reached final agreement in its meeting on 12 March.

The candidates nominated for an internship are:

- Victor Cuadrado (GIM), 3 months
- Lucas Setijadji (EREG), 6 months
- Julian Gomez (GFM), 12 months
- Yongjun Zhao (GFM), 3 months

and their names have been submitted to ESRI.

The committee is confident that these recent ITC graduates have high academic potential, are aptly skilled, and will be great ambassadors for ITC in California. They have clearly demonstrated what they hope to achieve there in order to further their knowledge and skills, and return as even better professionals.

We wish them the best of luck during their stay with the experts of ESRI.

## IIRS Announces Courses in Geo-informatics for Environmental Assessment and Disaster Management

Dean of IIRS dean@iirs.gov.in

**In recent times India has witnessed large-scale disasters such as the frequent floods in the Indo-Gangetic plains, the cyclones of Orissa and Gujarat and the earthquakes of Latur, Chamoli and Gujarat, as well as small-scale hazards such as landslides in the Himalayan range and forest fire in almost every part of the country.**

Although natural disasters cannot be fully prevented, sound disaster management strategy aided by the latest technological developments can minimise their impact. One such technology, geo-informatics, offers a powerful toolbox for creating maps, integrating information, visualising scenarios, solving complicated problems and developing effective solutions. Advanced

techniques such as remote sensing and global positioning systems, when integrated with geographical information systems, can provide valuable information on Earth's surface features and the processes involved.

Realising the tremendous potential of emerging geo-informatics technology to meet the challenges of sustainable development and disaster management, the Indian Institute of Remote Sensing (IIRS), in collaboration with the International Institute for Geo-information Science and Earth Observation (ITC), the International Institute for Infrastructural, Hydraulic and Environmental Engineering (IHE) and Wageningen University in the Netherlands, has introduced the following:

- Awareness Course (2 weeks' duration)
- Certificate Course (4 months' duration)
- Postgraduate (PG) Diploma (10 months' duration) in Geo-informatics for Environmental Assessment and Disaster Management.

These courses are designed to provide adequate theoretical and practical knowledge on the utility of geo-informatics in disaster management and environmental assessment. The geo-informatics technological inputs at all stages of disaster management are explained using examples taken from India and abroad. After attending the courses the participants are expected to participate actively in various activities dealing with disaster management. The faculty for the course has been drawn from IIRS and other centres of the Department of Space, and many reputed scientists, experts from India and abroad (including ITC experts), also deliver guest lectures on specific topics. The courses are modular in structure and each module is usually of three weeks' duration. The last module (4.5 months' duration) of the PG Diploma encourages course participants to take up projects of their own choice. During the project work of the PG Diploma and Certificate Course, three specialisations - hydrometeorology (flood, drought etc.), geology (earthquake, landslides etc.) and environment (deforestation, land degradation etc.) - are offered.

The target groups include decision makers, senior-level executives and managers for the Awareness Course, and working-level professionals, researchers and students for the Certificate and PG Diploma Courses. The minimum qualification for all courses is postgraduate in natural resources, earth sciences, urban and regional planning / ME/BE/B Arch. However, the final selection criteria are based on the percentage of marks at qualifying examinations and relevant experience in government departments if applicable.

More details about courses can be obtained from:

Dean
Indian Institute of Remote Sensing
(National Remote Sensing Agency, Department of Space, Government of India)
4-Kalidas Road, Dehradun, India
Phone: +91 (0)135 744583
Fax: +91 (0)135 741987

# ENVISAT Launched

Boudewijn van Leeuwen leeuwen@itc.nl

**The eagerly awaited launch of ESA's Envisat Earth observation satellite took place in Kourou, French Guiana, on 1 March at 22:07:59 hrs Kourou time (02:07:59 hrs CET). Envisat's night-time launch also marked the return to business for Europe's Ariane 5 launcher.**

Lift-off was witnessed by dozens of cheering engineers, scientists and project members at the launch site and at ESA centres across Europe. Twenty-seven minutes after lift-off, the Ariane 5 placed Envisat in an 800 km sun-synchronous polar orbit, allowing ESA ground controllers at the space operations centre in Darmstadt, Germany, to take full control of the satellite for the first time.

Envisat, Europe's heaviest and most complex satellite ever, follows in the footsteps of ESA's successful ERS-1 and ERS-2 missions launched in 1991 and 1995. The main goal of Envisat's five-year mission is to provide data to study environmental and climatic changes.

Envisat is expected to be declared operational after just a few weeks, once its payload has been checked out and the various data-recovery links set up. Then the satellite's six-month-long commissioning phase will begin, ensuring that the 10 instruments are operating as specified and that validated products can be delivered to the users. The instruments will observe the Earth from space, primarily addressing four crucial matters: global warming, climate change, ozone depletion and ocean and ice monitoring.
The payload consists of a set of 10 instruments:

1 March 2002: Envisat soars into orbit
(Photo: ESA/CNES/Arianespace-S.Corvaja)

### 1. ASAR

Advanced Synthetic Aperture Radar can be considered as the successor of the active microwave instrument on board ERS-1 and ERS-2.

### 2. MERIS

The MEdium Resolution Imaging Spectrometer is an instrument that measures the solar radiation reflected by the Earth in 15 spectral bands, in the visible and near infrared. The primary mission of MERIS is to measure sea colour in the oceans and coastal areas in order to determine chlorophyll pigment concentration, suspended sediment concentration and aerosol loads.

### 3. AATSR

The prime scientific objective of the Advanced Along Track Scanning Radiometer is to establish the continuity of the ATSR-1 and ATSR-2 data sets of sea surface temperature measurements from the ERS-1 and ERS-2 missions, thereby ensuring the production of a 10-year near-continuous data set for climate research.

### 4. RA-2

The Radar Altimeter 2 is derived from the ERS-1 and 2 radar altimeters, providing improved measurement performance and new capabilities. Its measurements are used to determine the ocean topography and to map and

monitor sea ice, polar ice sheets and most land surfaces. The RA-2 is supported by:

4a. MWR

The main objective of the MicroWave Radiometer is to measure the integrated atmospheric water vapour column and cloud liquid water content as correction terms for the radar altimeter signal. In addition, the data are useful for determining surface emissivity and soil moisture over land, for surface energy budget investigations and for ice characterisation.

4b. DORIS

The Doppler Orbitography and Radiopositioning Integrated by Satellite system was originally designed to perform very precise orbit restitution of low-Earth orbiting satellites. In addition to enabling orbit determination, data are provided to help in understanding the dynamics of the solid Earth, to monitor glaciers, landslides and volcanoes, and to improve modelling of the Earth gravity field and the ionosphere.

4c. LRR

The Laser Retro Reflector is not an observation instrument. It has two functions: support-to-satellite ranging and RA-2 altitude calibration.

5. MIPAS

The Michelson Interferometer for Passive Atmospheric Sounding is a Fourier transform spectrometer for measuring high-resolution gaseous emission spectra at the Earth's limb. It operates in the near to mid infrared, where many of the atmospheric trace gases playing a major role in atmospheric chemistry have important emission features.

6. GOMOS

The Global Ozone Monitoring by Occultation of Stars is a continuation of the GOME instrument on ERS-1. It is a tool to provide global ozone mapping and trend monitoring with very high accuracy, as needed for understanding ozone chemistry and for model validation.

7. SCIAMACHY

The SCanning Imaging Absorption SpectroMeter for Atmospheric CHartographY is designed and built as a joint German/Dutch project funded by the German (DARA) and Dutch (NIVR) national agencies, with Belgium contributing to the Dutch part. The SCIAMACHY primary mission objective is to perform global measurements of trace gases in the troposphere and the stratosphere, which are retrieved from the solar irradiance and Earth radiance spectra. The large wavelength is also ideally suited for determining aerosols and clouds. The SCIAMACHY instrument is a continuation of the GOME instrument on ERS-2 but also measures in the infrared part of the spectrum, making it possible to detect new molecules.

The application of MERIS data has received significant attention in recent research projects involving considerable input by ITC staff. Following recent discussions with the Royal Dutch Meteorological Institute (KNMI) on the potential of SCIAMACHY data for typical ITC applications, ITC will participate in KNMI's ESA Data User Program project, TEMIS, and use its expertise to improve the (specification of) SCIAMACHY end products.

For further reading, please contact:
ESA Media Relations
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Websites:
ESA: http://www.esa.int/
ENVISAT: http://envisat.esa.int/
TEMIS: http://neonet.knmi.nl/temis/

*This article is partly based on ESA Press Release N° 10-2002, 1 March 2002, Paris.*

# project news

## The Tropenbos Vietnam Programme – A Strategic ITC Research Collaboration Initiative

Mirjam Ros (TBI) rosm@xs4all.nl
Hans ter Steege tersteege@itc.nl

Headquarters of the Forest Inventory and Planning Institute, Hanoi (source: FIPI folder)

**In August 2001 the Vietnamese Ministry of Agriculture and Rural Development (MARD) and Tropenbos International signed an agreement setting the seal on the TBI-Vietnam Programme.**

This programme will follow the general Tropenbos model in that it will:

- combine research and training to support the conservation and wise utilisation of Vietnam's tropical rainforests
- integrate and translate the results of scientific research into meaningful information for policy makers, forest users and local communities.

The forestry sector in Vietnam is undergoing a process of reorientation. The Vietnamese government and various donors have joined forces to prepare a Forestry Sector Support Programme (FSSP). One of the programme objectives is to implement an integrated system of demand-driven and appropriate research, education and training. The TBI-Vietnam Programme will be developed as an integral part of the national forest research strategy embedded in the FSSP.

The 5 Million Hectare Reforestation Programme (5MHRP) is an important component of the FSSP. The government of Vietnam launched the 5MHRP in 1997 to increase the country's forest cover by 43% by 2010. The scope of the 5MHRP includes issues related to natural forests, biodiversity conservation, disaster management (including flooding), policy and institutional reform, human resource development and research.

The Royal Netherlands Embassy in Hanoi is one of the driving forces behind the FSSP and firmly supports the development and implementation of the TBI-Vietnam Programme. The embassy presently chairs the Partnership Support Programme (PSP), in which bilateral and multilateral donors and NGOs join forces.

In the Netherlands ITC will be responsible for the scientific coordination of the TBI-Vietnam Programme and Hans ter Steege of the Forest Science Division is, at present, the scientific coordinator. The ITC Directorate has embraced the TBI-Vietnam Programme since it is likely to have a significant spin-off in the fields of research (both PhD and MSc), consulting and advice, and training. This programme will form a firm well-equipped logistic base, embedded within Vietnam's mainstream research activities, where many SMART (Strategic Market-Adjusted R&D Transfer) activities could be executed. The programme is initially for five years but will most likely be extended for another five years. There is thus an opportunity to conduct SMART research on a permanent site for at least 10 years. Experience with Tropenbos programmes shows they are a fruitful base for developing PhD research proposals that more easily attract funding because of the logistic security and local embedding. The site will also place ITC in a new network of research partners in the region, e.g. FORSPA/FAO, CIFOR, SIDA and CIRAD. The counterpart institution of ITC in Vietnam will be the Forest Inventory and Planning Institute of the MARD.

There is also strong support from the Dutch Embassy for ITC's participation. The embassy's sector support pro-

gramme includes "forestry and biodiversity" and "water management and water transport" (together Euro 6 to 6.5 million annually), fields that are also within ITC's mandate and interests. Here there is the potential for input in the form of research consulting and training. The embassy has already expressed its willingness to match the TBI-Vietnam Programme with an educational programme worth Euro 0.7 million. Finally, there is a good opportunity for a URS study follow-up, not only in Vietnam but in the region. Again, the embassy has expressed a clear interest in funding this activity, while the MARD has expressed an interest in hosting a workshop on this subject.

The universities of Utrecht, Wageningen and Leiden have shown great interest in cooperating with ITC in various research areas.

### Programme Development

The development of the TBI-Vietnam Programme is closely intertwined with the drawing up of the national forest research strategy. The Swedish government, CIFOR, CIRAD, the MARD and FORSPA have supported this process, sponsoring a workshop in Da Lat in November 2001, which aimed at:

- identifying the research issues that require attention
- identifying the role of each agency in the 5MHRP
- identifying input areas for donor agencies
- promoting collaboration among all partners
- formulating an implementation strategy.

Hans ter Steege of ITC participated in this workshop.

The workshop revealed that research needs focus mainly on land use planning, management of the forest production sector, livelihoods and the institutional component (policy, law and infrastructure). Approaches stressed were participation, cross-sectoral analysis and the involvement of scientists outside the forestry sector, especially for poverty research. A research matrix has been circulated among ITC staff who had initially shown interest in the programme. A cursory glance at that research matrix will already reveal the many linkages with ITC's five research spearheads. Information is also available from Hans ter Steege or Esther Hondenbrink.

During previous rounds of opinion forming and discussion with relevant Vietnamese authorities and key persons, several possible research topics were suggested. These included:

- forest land classification and land evaluation
- livelihood needs and community-based forest management models
- forest valuation, pricing mechanisms and benefit sharing
- interface between socio-economic dynamics and ecosystem use
- biodiversity
- criteria and indicators for sustainable forest management, including the sustainable production of timber and non-timber forest products.

Participants at the Da Lat workshop (November 2001)

### Visitors at ITC

A group of senior forest research managers from Vietnam visited the Netherlands from 7 to 11 January 2002. The party included Dr Do Dinh Sam, Director of the Forest Science Institute of Vietnam (FSIV, Hanoi); Dr Le Thanh Chien, Director of the NTFP Research Centre under FSIV, and National Project Director for IUCN International's NTFP project in Vietnam; and Dr Ha Chu Chu, Vice-Director of ECO ECO

Vietnamese scientific directors take a 3D view of the world at ITC's information technology section (photo by Bert-Jan Ottens of ProFound)

and former director of the FSIV. The objectives of the visit were to gain an understanding of tropical forest-related research programmes and capacities and research planning and management systems in the Netherlands, and the role of different institutions in the system, including NGOs.

Visit to Vietnam

To strengthen the relationship with the Vietnamese partners and establish a basis for the TBI-Vietnam Programme, the Dutch scientific coordinator, Hans ter Steege, visited Vietnam from 15 February to 16 March 2002. The main objectives of the visit were to show our Vietnamese partners and other interested parties that Tropenbos is eager to make progress with implementing the Agreement. During the visit a start was also made on developing, agreeing and partly implementing an action plan for the formulation of a National Forest Research Agenda (NFRA) in support of the 5MHRP and FSSP and for the TBI-Vietnam Programme.

Now back in the Netherlands, the scientific coordinator is due to take part in the International Tropenbos Seminar in The Hague. It is expected that some of the Vietnamese partners will also be present during this week and that ties between our partners and Dutch Institutes will be further strengthened.

The TBI-Vietnam Programme is in its starting phase. Our visits to Vietnam and the visits of our Vietnamese counterparts to the Netherlands are an indication that a partnership is developing. This partnership holds promise for the development of Vietnam and the research activities of ITC's spearhead programme, SMART.

## Growing Interest in Geo-information for Coastal Zone Management in Eastern Africa

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Introductory screen Short Course on Remote Sensing for Coastal Zone Management in Tanzania (January 2002)

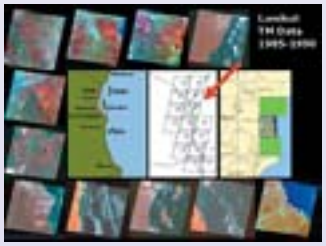
**In January a short course on remote sensing for coastal zone management was successfully run at the University College of Lands and Architectural Studies (UCLAS) in Dar es Salaam, Tanzania. After coastal research and consulting projects by ITC in Asia and the Caribbean, the coastal zone of Eastern Africa provides a new challenge.**

Since 1998, UCLAS and ITC have cooperated in capacity building in the field of environmental information systems - the EISCAP project. Tanzanian professionals who are active in the management and planning of natural resources have undergone training in the applications of modern geo-information techniques, and staff exchange between UCLAS and ITC has also been a feature of the project. The project is now


Landsat TM true-colour composite of the test area Bagamoyo, Tanzania


Landsat TM false-colour composite of the test area Bagamoyo, Tanzania


Spot XS false-colour composite of the test area Bagamoyo, Tanzania


Landsat TM series of false-colour composites of the Tanzanian coast between 1985 and 1990

reaching its final phase, with some new activities in the field of geo-information for coastal zone management (CZM).

Discussions with representatives from coastal districts bordering the Indian Ocean, brought together in the context of Tanzania's Coastal Management Partnership (TCMP), revealed a real need for training in applications of coastal remote sensing. Moreover, the skills acquired should be applicable to spatial planning for coastal zone management at the local level. With this in mind, UCLAS, TCMP and ITC staff collaborated in a three-week course tailor-made for Tanzanian CZM professionals. During the course the participants were taken from (1) the concepts of coastal zone management, and (2) the basics of remote sensing theory, through (3) the state of the Tanzanian Coast, to (4) applications of the technology to the coastal area of Bagamoyo.

In two weeks of course work, a combination of lectures, practical exercises and exploring Internet information networks brought the 15 participants to a more or less similar level in terms of CZM knowledge and digital image data handling skills. In the final week, a group assignment was undertaken on the use of Landsat TM and Spot satellite imagery for coastal habitat mapping and land use change detection. This assignment also included a field survey in which the link between image data and reality was established on the basis of georeferenced observations. A workshop on "How to go from potential to actual uses of remote sensing for CZM in Tanzania" concluded the course.

According to the participants, the course merits a follow-up for CZM professionals from coastal districts in the countries bordering Tanzania, i.e. Kenya and Mozambique. Another clear need was expressed for more applications of marine coastal remote sensing. The resulting maps of coastal habitats and land use in the Bagamoyo area will be used and further improved in the coming field survey by a group of 20 ITC students in June 2002. In July 2002, the information will be used in a short course on planning for coastal zone management at the local level.

The remote sensing course was a success in many aspects, not least in passing selected training materials on to the participants free of charge. Some of these materials can also be obtained via Internet, e.g.:

- Eastern African Atlas of Coastal Resources for Tanzania (www.unep.org/eaf/tanzaniabook/)
- Remote Sensing Handbook for Tropical Coastal Management (www.unesco.org/csi/pub/source/rs.htm)
- UNESCO-BILKO Learning Modules 1-7 on Remote Sensing Applications to CZM (book and CD-ROM) (www.unesco.bilko.org).

The following organisations are acknowledged for their kind support: UNEP in Nairobi, UNESCO-CSI in Paris, and the coordinating office of the UNESCO-BILKO project at ITC in Enschede.


Fieldwork in the Bagamoyo coastal area: groundtruthing a tidal flat and mangrove stand density (January 2002)


Fieldwork in the Bagamoyo coastal area: groundtruthing the mangrove area and the state of mangrove harvesting (January 2002)


Graduation ceremony on the final day of the course: Mr Daffa (TCMP), Dr Mtalo (UCLAS) and Mr Gwacha MSc (UCLAS) presenting the course certificate

# Short Course on Landslide Hazard Assessment Using GIS and Remote Sensing

San Salvador, El Salvador, 22-26 October 2001

Siefko Slob slob@itc.nl

**In October 2001 a one-week course on landslide hazard assessment was held in San Salvador, the capital of El Salvador**.

A field visit was made to Las Colinas landslide in order to observe the devastating results that landslides can have.

A total of 29 participants from three different countries (El Salvador, Guatemala and Honduras) participated in this course. The organisation was in the hands of Sebastiaan Wesselmans from the Centro Agronomica Tropical de Investigacion y Ensenanza (CATIE). ITC's Siefko Slob (Engineering Geology Division) and Estuardo Lira (USGS, Guatemala) were the lecturers for the entire week. The course was organised as part of a large project on transnational watershed management in the Rio Lempa catchment area, which extends across the borders of El Salvador, Guatemala and Honduras. The course was financed under this project (which was initiated after hurricane Mitch) and the participants were from the different national organisations that contributed to this project.

A total of 29 participants from three different countries (El Salvador, Guatemala and Honduras) participated in this course.

The University of El Salvador, which boasts excellent computer facilities, was the venue. Most of the course participants already had a solid background in GIS so they quickly grasped the basis concepts of ILWIS, which was used for the practical exercises. The morning lectures provided the participants with background information on the technical aspects and the different mechanisms involved in generating landslides. Exercises in the afternoon sessions demonstrated different approaches to carrying out landslide hazard analysis using GIS and remote sensing. The lectures and practicals were prepared by ITC's Cees van Westen (Applied Geomorphology Division). Thursday afternoon and Friday morning were spent on a landslide case study of the Rio Lempa study area, which was prepared and carried out by Estuardo Lira.

On Wednesday afternoon a field visit was made to Las Colinas landslide in order to observe the devastating results that landslides can have. The earthquake (M-7.6) of 13 January 2001 off the coast of El Salvador triggered a deep and massive landslide from Balsamo Ridge and destroyed much of Las Colinas neighbourhood of Santa Tecla, just outside the city of San Salvador. It is expected that the participants of this intensive course will have acquired a better understanding of the complicated mechanisms involved in landslide processes, as well as some practical experience in using GIS to mitigate the effects of these devastating events.

Exercises in the afternoon sessions demonstrated different approaches to carrying out landslide hazard analysis using GIS and remote sensing.

# Research News

## PhD Graduation: John Carranza

Martin Hale hale@itc.nl

Dr John Carranza after his successful defence of his thesis at Delft University of Technology

John Carranza was born in Legazpi, the Philippines, earned his BSc in geology in his native country and subsequently joined the Bureau of Mines there. In 1989 he was awarded a fellowship of the Netherlands Fellowship Programme to study for a postgraduate diploma in mineral exploration at ITC.

Upon his return to the Bureau of Mines, his application of knowledge and skills learned at ITC led to the discovery of a new zone of gold mineralisation. Later, and again with the support an NFP fellowship, he completed an MSc (with distinction) in mineral exploration at ITC, and for a related scientific paper published in the *Journal of Geochemical Exploration* he was awarded the 1998 ITC Research Award. After another period with the Bureau of Mines in the Philippines, he won a scholarship from the Netherlands Ministry of Development Cooperation and embarked on his PhD research at ITC. In the course of his research he published many scientific papers and completed a PhD thesis of 480 pages entitled *Geologically-Constrained Mineral Potential Mapping*, which he defended successfully at Delft University of Technology on 4 February 2002. The guest examiner at his defence was Prof. Graeme Bonham-Carter, author of the textbook *Geographic Information for Geoscientists – Modelling with GIS*, which is widely used in ITC's educational programme in Earth Resources and Environmental Geosciences.

### Geologically-Constrained Mineral Potential Mapping

Mineral potential mapping poses a problem when the geo-exploration data available are limited to geological maps and satellite imagery. To address this problem, methods were developed for (1) remote detection of indications of mineralisation; (2) quantifying spatial associations between mineral deposits and geological features; and (3) geologically-constrained mineral potential mapping. The methods developed were applied in areas in the Philippines: Benguet Province and the Abra area to map porphyry copper potential; the Baguio district and Catanduanes Island to map epithermal gold(-copper) potential; and the Isabela area to map nickeliferous-laterite potential.

A mineral imaging method using two Landsat TM band ratio images in principal components analysis to remove the spectral effects of vegetation and create mineral images of each of the predominant hydrothermal alteration minerals was developed. The mineral images, a digital elevation model image and training pixels of the known hydrothermal alteration units were used in a supervised classification to map hydrothermal alterations. The resulting maps have an accuracy of 82% for the Baguio district and 73% for Benguet Province.

In order to quantify spatial association between mineral deposits and geological features, which is important in mineral potential mapping, a new distance correlation method was devised. It has no assumption of the probability distri-

bution of the mineral deposits and is thus advantageous over the established distance distribution method, which assumes a Poisson distribution for mineral deposits. It is not sensitive to the number of mineral deposit points used in the analysis and is thus advantageous over the established weights of evidence method, which needs a fairly large number of mineral deposit points for the quantified spatial association to be statistically significant. The distance correlation method is a satisfactory method; it produces statistically-significant results when the probability distribution of the mineral deposits is unknown and when only a few mineral deposits are known.

Different methods for geologically-constrained predictive mineral potential mapping were developed using (1) simple map algebra, (2) weights of evidence modelling, (3) the theory of evidential belief, (4) the theory of fuzzy sets, (5) logistic regression and (6) principal components analysis. The applications of simple map algebra and weights of evidence modelling involve binary predictor patterns of geological features. The applications of the theory of evidential belief, the theory of fuzzy sets, logistic regression and principal components analysis involve multiclass predictor patterns of geological features. The quantified spatial associations between the mineral deposits and curvilinear or point geological features were useful in transforming these geological features into binary or multiclass predictor patterns to map mineral potential.

The promotion (examination) committee with Dr Carranza; from left: the pedel, Prof. van der Meer (Delft University of Technology and ITC), the chairman of the promotion committee Prof. Aarts (representing the Rector Magnificus of Delft University of Technology), Dr de Boorder (University of Utrecht), Prof. Turner (Delft University of Technology and Colorado School of Mines), Dr Carranza, Prof. Bonham-Carter (University of Ottawa and Geological Survey of Canada), Dr Carranza's promotor, Prof. Hale (Delft University of Technology and ITC), Prof. Kroonenberg (Delft University of Technology) and Prof. de Jong (University of Utrecht)

Weights of evidence modelling and the application of the theory of evidential belief are useful when the number of mineral deposits used in the predictive modelling is equal to greater than 23, as in Benguet Province. Simple map algebra and the application of the theory of fuzzy sets are useful when the number of mineral deposits used in the predictive modelling is marginally adequate (i.e. 19) to low (i.e. 12), as in the Baguio district, Catanduanes Island and the Abra area. Logistic regression modelling is useful when the number of mineral deposits used in the predictive modelling ranges from 17 to 23. The wildcat mapping method is useful when the geology is known but mineral deposits are unknown.

The different methods for geologically-constrained predictive mineral potential mapping indicate that about 23% of Benguet Province has potential for porphyry copper deposits, about 22% of the Baguio district has potential for epithermal gold deposits, about 23% of Abra has potential for porphyry copper deposits and about 22% of Catanduanes Island has potential for hydrothermal deposits. For Benguet Province, the Baguio district, the Abra area and Catanduanes Island, the average success rates of the predictive maps are at least 60%.

For the Isabela area, an average of 50% of the ultramafic terrane has high potential for nickeliferous-laterite, whilst an average of 33% of the sec-

Copies of Geologically-Constrained Mineral Potential Mapping by Dr John Carranza are available from the ITC Bookshop.

ITC Bookshop
P.O. Box 6
7500 AA Enschede
The Netherlands

E-mail: bunk@itc.nl,
Fax: +31 (0)53 487 44 00

Price: Euro 13.16 (excluding mailing costs),

Publication number: DIS086

tion with known nickeliferous-laterite deposits has high potential for this type of deposit. The section with known nickeliferous-laterite deposits is less prospective than other sections in the ultramafic terrane. However, the more prospective sections are within a portion of the Isabela area that is protected from mineral resources development. The prohibition on mineral resources development, which was imposed prior to the generation of the geologically-constrained predictive maps, is not being disputed. Nevertheless, the results demonstrate that mineral potential maps are important inputs for optimum land use decision making.

The results demonstrate the efficacy of the different methods developed for geologically-constrained predictive mineral potential mapping. Development of such methods can help public service organisations of countries where systematic and comprehensive geo-exploration is lacking to define prospective land, weigh mineral potential against competing demands for land use other than mineral resource development, and stimulate exploration investment through non-alienation of prospective areas.

## Basic Issues in Organisational Capacity Building

Douglas Horton horton@cgiar.org

**Capacity building has moved centre stage in contemporary development efforts. This article, based on recent experiences managing and evaluating capacity building efforts, discusses 12 key aspects of planning, implementing and evaluating organisational capacity building initiatives.**

*1. What is meant by organisational capacity building?*

*Capacity building* is the process by which individuals, groups, organisations and institutions strengthen their ability to carry out their functions and achieve desired results over time (Morgan, 1997). *Organisational capacity building* refers to the process of change that enhances the efficiency, effectiveness and sustainability with which an organisation pursues its goals.

*2. Why is organisational capacity building important?*

Many development projects fail because local capacities are not built up to manage activities or maintain facilities when the project ends. In the current era of accelerating technological and institutional change and declining budgets for overseas development assistance, strengthening the capabilities of individuals, organisations and institutions is essential to ensure the sustainability of development efforts. Due to the rapid pace of technical and institutional change in contemporary society, individual skills and organisational structures quickly become obsolete and must be regularly updated.

*3. What are the priorities for capacity building?*

The design and management of capacity development efforts leave much to be desired. Too often, international agencies offer "generic" training or services that fail to address the most pressing development needs in organisations in developing countries. A key factor in organisational capacity development is to balance the acquisition of "hard" and "soft" assets. Physical re-

sources and facilities are essential, but without appropriate management skills and systems, they may be underutilised or fall into disrepair.

*4. At what level should we target capacity building efforts?*

Capacities may be built up at various levels, ranging from the individual to the organisational, national and international levels (Figure 1). It is simpler to develop individual capacities than to build the capacities of organisations or broader systems. However, targeting interventions at the individual level does not lead automatically to a stronger organisation. Changes in the organisation's procedures and culture are often needed for new skills of individuals to be used and bear fruit. Building an organisation's capacity to achieve its goals generally requires changes in policies and procedures as well as technical training.

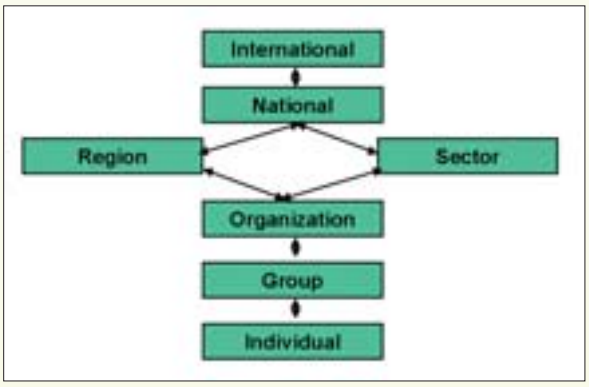



Figure 1. Levels at which capacity building may take place

*5. How does capacity building relate to organisational performance?*

An organisation's *performance* can be gauged in terms of its effectiveness, efficiency and sustainability. Performance is influenced by three main factors:

- *Operational environment* – the legal, social and economic context in which the organisation operates
- *Organisational capacity* – the staff complement and resources, organisational structure, management systems and external linkages
- *Organisational motivation* – internal factors that influence the direction of the organisation and the energy displayed in its activities (Figure 2).

For a capacity building initiative to lead to improved organisational performance, constraints in the organisation's motivation and its operational environment often have to be dealt with.

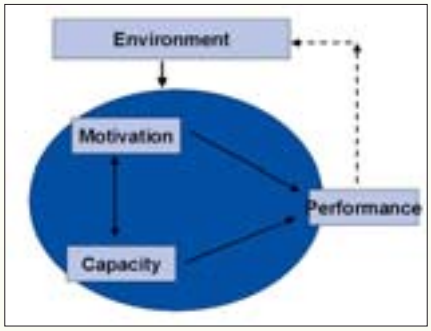



Figure 2. Relationship between an organization's environment, motivation, capacity and performance

*6. Is capacity building a means to achieve other development goals or is it an end in itself?*

The World Bank, UNDP and many other international agencies often view capacity building as a means to promote and ensure the sustainability of development efforts and achieve long-term development goals. In contrast, many non-governmental and voluntary service organisations view capacity building as empowerment, which for them is the central purpose of development efforts. My personal view is that capacity building and empowerment are desirable ends in themselves as well as means to achieve other development goals.

*7. How are capacities acquired or developed?*

Capacities cannot be "transferred" from one organisation to another. They must be developed by the concerned individuals and organisations to meet their own needs. Capacity building involves the acquisition of new knowledge and its application in pursuit of personal and organisational goals. Hence, experiential learning is at the heart of capacity building. Capacity building initiatives generally include a mix of approaches, including provision of information, training and professional services. Information dissemina-

*Douglas Horton is an evaluation specialist working at the International Service for National Agricultural Research, P.O. Box 93375, 2509 AJ, The Hague.* *This paper is based on applied research, training and professional services carried out in several organisations. The author would like to express his indebtedness to colleagues who, over the years, have provided innumerable ideas and insights on capacity building and its evaluation.*

tion and one-off training events can be used to reach large numbers of individuals and organisations, but they generally produce few significant or lasting organisational changes. Professional services and facilitation of change processes are generally more effective, but they have a more restricted reach (Figure 3). Organisational learning can be promoted by the exchange of information and experiences among people and teams working on similar tasks in different settings. For this reason, networks and communities of practice can be valuable aids to capacity building. Learning is also aided by rapid feedback on the results of activities carried out. Hence, internal evaluation is valuable for capacity development efforts.

*8. What makes or breaks a capacity building effort?*

Building new capacities must often be coupled with the destruction of old ones, through changes in the organisation's resources, personnel, structures, procedures and activities. Large-scale organisational change is generally favoured by the following conditions: an external environment that promotes and encourages change; top managers who lead change efforts; a critical mass of staff members who are involved and support the change process; competent management of the change process; adequate resources for designing and implementing changes; and appropriate institutional innovations. Many capacity building initiatives fail because they focus on providing institutional innovations while other factors are blocking organisational change.

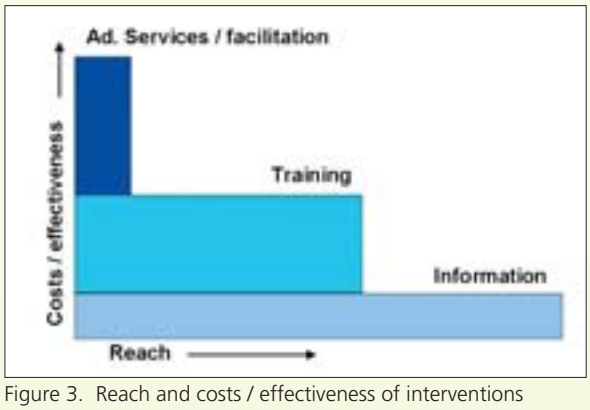



Figure 3. Reach and costs / effectiveness of interventions

*9. What roles can external experts or agencies play in capacity building?*

An external agent should not attempt to lead capacity building in another organisation. Each organisation must take responsibility for developing its own abilities. What external agencies can do is promote and backstop capacity building and provide useful information, training and learning opportunities.

*10. How should capacity building efforts be planned and managed?*

In technical projects that operate in well-known and predictable environments, highly rational "blueprints" can be developed to guide implementation, monitoring and evaluation. However, organisational capacity building efforts involve more social experimentation than social engineering. They cannot be planned with the same technical precision, and they are not amenable to mechanistic implementation. Planning is essential to think through the capacity building process before it begins, but plans should be frequently updated to reflect the progress and the lessons learned.

*11. How should capacity building efforts be evaluated?*

Capacity building efforts should be evaluated for two fundamental reasons: to learn lessons from the past in order to improve ongoing and future work and to account for the use of resources and justify the continuation of activities. Most evaluations are carried out to meet accountability requirements. However, the greatest potential value of evaluation is to improve capacity building efforts. Learning and improvement are fostered by participatory evaluation approaches that involve programme staff and stakeholders in reflecting on their goals and accomplishments, strengths, weaknesses and lessons (Figure 4).

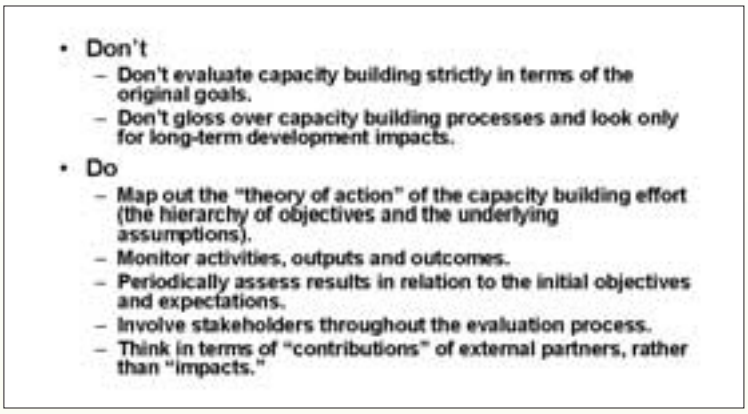



Figure 4. Some "dos" and "don'ts" for evaluating capacity building

*12. Until when should capacity building efforts be supported?*

Capacity building should not be viewed as a one-time or one-shot event. Organisations need to continuously develop their capacities to deal with new opportunities and threats that originate from changes in technology, markets, politics and other factors. In this sense, an organisation's capacity building efforts should never end. Today and in the future, one of the most critical of all capacities will be an organisation's ability to plan, implement and evaluate its own development efforts.

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## Dr Christine Dunn, Lecturer in Geography, University of Durham, Visits ITC

Christine Dunn C.E.Dunn@durham.ac.uk

Dr Dunn, lecturer in geography at the University of Durham, UK, delivered a lecture in the ITC auditorium on GIS for development in lower-income countries

**Dr Christine Dunn, lecturer in geography, University of Durham, UK, visits ITC to deliver a guest lecture and to discuss collaboration in research and education activities.**

On 13 February 2002 Dr Christine Dunn, lecturer in geography at the University of Durham, UK, delivered a public lecture in the ITC auditorium on the theme of GIS for development in lower-income countries. The lecture, which was very well attended by staff and students from a range of ITC divisions, formed part of a three-day visit by Dr Dunn, organised to exchange experiences and explore possibilities for collaborative research and education activities.

During her presentation Dr Dunn reflected on the problematic nature of the term "development" and on recent debates and critiques around the use of GIS as a technology in developing countries. She proposed that appropriate uses of GIS were those that consider *first* the political, social and institutional contexts before providing a technical evaluation. Dr Dunn went on to describe how these ideas are incorporated into her teaching in a Master's programme in Geographic Information for Development at the University of Durham. On this course the teaching advocates the importance of the local context, in terms of the time and place in which GIS projects are implemented. Those projects that are most likely to fail are those in which technocratic "quick fix" approaches are adopted. Central to this concept is the recognition that data are socially constructed and can be used to represent social and political agendas. The dissemination of these ideas to stu-

dents can present particular challenges when students arrive in the UK with specific expectations that may have been placed upon them by their home organisations. Many are under pressure to learn specific software packages, and for those who teach on the course there is often a difficult balance to maintain between, on the one hand, training students to use GIS software and, on the other, educating and facilitating them to think critically about geographical data.

Joint collaboration between the University of Durham and Jahangirnagar University, Bangladesh, allows a sustained base of local expertise in GIS

In an attempt to maintain a sustained base of local skills and expertise, the Geography Department at Durham has developed longer-term collaborations with organisations in lower-income countries. One such venture is the partnership, maintained by financial support from the British Council, between Durham and Jahangirnagar University in Bangladesh. This has enabled a number of staff from Jahangirnagar to undertake the Master's programme in Durham, return home to teach undergraduates and finally re-visit Durham to undertake PhD programmes. The collaboration has enabled a critical mass of human resources, hardware and software, as well as library materials, to be built up in the Department of Geography at Jahangirnagar.

Dr Dunn explored ways in which public participation approaches can be used as a way towards more appropriate application of GIS. This "participatory GIS" takes advantage of qualitative methods (such as group mapping, in-depth interviews and activity ranking) to enable local participants rather than to simply extract information from them. The approach therefore aims to avoid some of the critiques of traditional GIS by incorporating community needs and by recognising social and political relations. As a more inclusive means of gathering and analysing geographical information, this approach seeks to involve communities in the active creation and use of data that inform decision-making processes. Conventional spatial data as defined by "experts" and represented through traditional means (such as a satellite image) are therefore integrated with local and indigenous geographical knowledge and spatial activities. This offers a means of bringing together quantitative and qualitative information and of exposing alternative representations of place and reality that conventional GIS obscures. In so doing we attempt to uncover something of the processes at work in particular settings rather than simply describing spatial distributions. As with conventional GIS, though, caution needs to be exercised in terms of who "owns" and controls the results since, in the wrong hands, participatory GIS has the potential to be misused in the same way that traditional GIS or hardcopy maps have.

During her visit Dr Dunn also participated in two internal workshops: one on participatory GIS for local governance, and one on capacity building. During these sessions important issues were raised in terms of the implications of participatory GIS for approaches to teaching; ownership of and access to geographical information; appropriate representations of scientific and indigenous knowledge; and individuals as change agents. As a result of discussions between Dr Dunn and ITC staff, plans for a collaborative meeting on education and capacity building in GIS in lower-income countries are now being developed.

# The Agricultural Research Council – Range and Forage Institute and Sustainable Resource Use in South Africa

Mike Peel

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**The Agricultural Research Council (ARC) of South Africa works closely with the National Department of Agriculture to provide high-quality research aimed at facilitating equitable development and access to natural resources. One of the main functions of the ARC is to promote sustainable resource use and management practices.**

The Range and Forage Institute (RFI) is a part of the "Livestock" group of Institutes which include the Animal Improvement Institute and the Animal Nutrition and Products Institute. The RFI uses research projects to provide integrated land use strategies while promoting participatory needs-driven programmes. The author works within the Rangeland Dynamics Programme, which focuses on rangeland description and evaluation, rangeland management for sustainable animal production and wildlife utilisation and rehabilitation ecology.

More specifically, the author is project leader of the Savanna Ecosystem Dynamics Programme in the eastern Lowveld of South Africa. This project was set up in 1989 to investigate the potential of Lowveld savannas to contribute to the economy and development of the region in harmony with social and environmental needs. One of the major aims is to gain a predictive understanding of vegetation dynamics in the region and to use the results to manage these savanna systems effectively.

Typical savanna found in the wetter southern part of the study area

The database has been used to set up decision support systems that offer a flexible management style (adaptive management) where hazards are avoided and opportunities grasped to the benefit of the reserve.

### Research Directions

Historical issues form an important basis for the project. Land use changes related to the impact of man have shaped the way that these systems have developed and function. An important factor relating to man's impact is the manipulation of animal numbers and type.

In terms of ecosystem functioning, we are currently undertaking a review of approaches to understanding savanna dynamics. Using frameworks thus obtained, a hypothetical model of savanna dynamics in the eastern Lowveld of South Africa is being constructed. The latter will be used to construct decision support systems based on the principle of sustainable utilisation.

Ecological sampling of an extensive area (some 400,000 ha) poses a unique set of questions, particularly within the constraints of limited staff and funding (the current project is staffed by one researcher and two technicians). This part of the study is therefore aimed at examining strategies and constraints relating to a long-term ecological survey, while resource classification is aimed at an appropriate classification for the grouping of similar sites for comparative purposes.

The evolving use of stocking rate indices based on animal number and type in heterogeneous semi-arid savannas and complex land use systems has provided an approach to determine stocking density by using animal type, biomass, rainfall and vegetation parameters. The development of this as a coarse-scale (regional) and ranch-specific model to cover a range of scales and heterogeneity in key resources is advocated.

Data are being analysed in terms of environmental and management correlates of recent differences in vegetation state, using multivariate analysis and linear modelling. The latter is aimed at providing both scientific and management information regarding factors operating at different scales, based on sustainable utilisation parameters.

### Collaboration

The potential for collaboration is based on the long-term ecological research network approach. It is felt that a suitable arrangement between short-term projects and long-term objectives should be struck. The latter aims to facilitate core staffing and the collection of long-term data onto which short-term projects can be attached (RFI/ITC visit). The need to inculcate a "spirit of concern" for long-term data collection (such as that being done by RFI in the eastern Lowveld – inter-institutional arrangements) is highlighted. We need to identify different combinations of role players in terms of logistics (land), scientific leadership and academic support, as well as issues relating to data management. In this regard this may be an opportune time to set up a memorandum of understanding between ITC and ARC-RFI. This is pertinent as the interactions between Prof. Andrew Skidmore and myself have resulted in Onnie Mutanga and Jelle Ferwerda, two ITC PhD students, coming to South Africa to complete their fieldwork. The additional collaboration with South African national parks regarding these two projects is seen as a positive development.

An example of the vegetation found in the drier north of the study area

### Acknowledgements

Dr A. Aucamp (Director ARC-RFI) and Rich Hurt (Programme Manager Rangeland Dynamics) for permission to make the study trip; Prof. Andrew Skidmore (ITC) for facilitating the visit; Dr Rina Grant, A. Toerien, M-T Uys, R. Smart and Dr H. Biggs for assistance in various ways.

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# Alumni associations (updated 2002!)

***Listing of all Netherlands and ITC alumni associations***

The mission of the Netherlands Alumni Associations (NAAs) and the ITC alumni associations is to enable people all over the world who have studied in the Netherlands or at ITC in particular to build personal networks and share knowledge, ideas and experience with one another and their Dutch counterparts. Alumni who would like to set up similar associations in their own country can contact ITC.

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why wait

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We would welcome your contributions and suggestions for future issues of ITC News, for instance for the column

## Life after ITC

In this column, we publish stories of ITC alumni (max. 750 words) writing about their present work experience, the effects of their study at ITC, their current interests and their suggestions for changes.

If you would like to contribute to "Life after ITC", please write to or preferably e-mail (itcnews@itc.nl) the Acting Managing Editor:
ITC, P.O. Box 6, 7500 AA Enschede, The Netherlands.

Please do not forget to:
- include at least one (high-resolution) photograph of yourself
- mention your course and study year and - to stimulate interaction
- how you can be contacted.

Your article could be another step towards making ITC News a lively forum for the exchange of news and views from around the globe.

**So why wait?**

# CONFERENCE CALENDAR

**IST 2002**
04/11/02 - 06/11/02
Denmark, Copenhagen

*http://europa.eu.int/information_society/programmes/research/ist_event_2002/index_en.htm*
*e-mail infso-ist2002conf@cec.eu.int*

**Space Applications for Heritage Conservation**
05/11/02 - 08/11/02
France, Strasbourg

*http://www.eurisy.asso.fr*
*e-mail eurisy@micronet.fr*
*ITC attendance: Robert Hack*

**International Conference de SADAOC**
09/11/02 - 11/11/02
Mali, Bamako

*e-mail Dadaoc.se@fasonet.bf*

**European Research 2002**
11/11/02 - 13/11/02
Belgium, Brussels

*http://europa.eu.int/comm/research/conferences/2002/*
*e-mail rtd-conference2002@cec.eu.int*

**GIS Day 2002**
20/11/02 - 20/11/02
Events will be held worldwide

*http://www.gisday.com*
*e-mail gisdayinfo@gisday.com*

**From Conflict to Cooperation in International Water Resources**
22/11/02 - 22/11/02
Netherlands, Delft

*http://www.unesco.org/water/wwap/pccp*
*e-mail pccp@ihe.nl*
*ITC attendance: Jeroen Verplanke*

**ACRS 2002**
25/11/02 - 29/11/02
Nepal, Kathmandu

*http://www.acrs2002kathmandu.gov.np/*
*e-mail info@acrs2002kathmandu.gov.np*
*ITC attendance: Sjaak Beerens, Robert Hack, Marco Huisman, Martien Molenaar, Dhruba Shrestha, Siefko Slob, Paul Schoonackers, Jeroen van den Worm*

**ISPRS Commission VII Symposium**
03/12/02 - 06/12/02
India, Hyderabad

*http://www.commission7.isprs.org*
*e-mail isprstcvii@nrsa.gov.in*
*ITC attandance: Sjaak Beerens, Kees de Bie, Iris van Duren, Jelle Ferwerda, Yola Georgiadou, Martien Molenaar*

**NGMSO Congress**
04/12/02 - 04/12/02
Netherlands, Amsterdam

*e-mail http://www.ngmso.nl*
*ngmso@geo.vu.nl*

**International Conference on Water and Waste Water**
11/12/02 - 13/12/02
India, New Delhi

*http://www.iitd.ac.in/wapdec*
*e-mail wapdec2002@yahoo.com*

**Map India 2003**
28/01/03 - 31/01/03
India, New Delhi

*http://www.mapindia.org*
*e-mail info@mapindia.org*

**Geomatic Week #5**
11/02/03 - 14/02/03
Spain, Barcelona

*http://setmanageomatica.ideg.es*
*e-mail infosg@ideg.es*

**GNSS 2003**
22/04/03 - 25/04/03
Austria, Graz

*http://www.teleconsult-austria.at/gnss2003/index.html*
*e-mail office@gnss2003.com*

**ASPRS 2003**
03/05/03 - 09/05/03
USA, Alaska, Anchorage

*http://www.asprs.org/alaska2003/index.html*
*teidel@gci.net*

**Hutton Symposium on the Origin of Granites and Related Rocks #5**
02/09/03 - 06/09/03
Japan, Toyohashi

*http://www.gsj.jp/Info/event/hutton*
*e-mail Hutton-V@m.aist.go.jp*

**ISPRS WG VI/3**
15/10/03 - 18/10/03
Croatia, Zagreb

*http://www.isprs.org*
*e-mail ljerka.rasic@dgu.tel.hr*

**ISPRS Congress #20**
12/07/04 - 23/07/04
Turkey, Istanbul

*http://www.isprs2004-istanbul.com*
*e-mail oaltan@srv.ins.itu.edu.tr*

**ITALIA 2004, International Geological Congress # 32**
20/08/04 - 28/08/04
Italy, Florence

*http://www.32igc.org*