content

2007 number 4

introduction

When the *ITC News* lands on your desk, do you scan the table of contents to find something of immediate interest? Is there perhaps a report of that alumni gathering you attended a couple of months ago? Or are there plans for a particular refresher course you've long been waiting for? What's been going on within the Institute lately? Is there any news of your former classmates? And what are the new directions in international education and on the scientific front? Well, you will find answers to many such questions between the covers of this issue.

Those of a scientific bent - and, let's face it, it would be surprising if there are any among our readership who are not - will surely be keen to read about the two doctoral dissertations (and the related research) that were successfully defended last September (pages 12 and 13). And the article on developments in flooding simulations (pages 6-8) certainly make for interesting reading.

Recognition of cross-board education - "clearly [..] a phenomenon that will not disappear"- is the topic dealt with on pages 2-5. And remaining in the realm of education, this issue of *ITC News* also introduces you to two new ITC professors, who delivered their inaugural addresses on 17 December 2007. The brief introduction on page 14 will not only familiarise you with their names but also give you a glimpse into the future.

As you know, ITC has a vast and valued network of some 19,000 alumni - or, if you will, 19,000 ambassadors - spread across the world. You will find some of their names in this issue: perhaps they themselves have contributed articles; perhaps there are tales of their exploits. Among the successes and awards, you will also read of disappointment and unfortunately even tragedy.

So there you have it, the 2007-4 issue of *ITC News.* Perhaps you tend to read the newsletter from cover to cover rather than dip and delve but, whatever your preference, we submit this collection of articles to you for - to coin a scientific phrase - an *integrated assessment.*

Janneke Kalf
Managing Editor

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A Problematic Issue: Recognition of Cross-Border Education

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On 1-2 November the Group on Earth Observations (GEO) members of the International Society for Photogrammetry and Remote Sensing (ISPRS) organised an executive seminar on the recognition of cross-border education initiatives. The seminar took place at ITC in Enschede, the Netherlands.

Why Cross-Border Education?

A number of years ago, ITC embarked on a policy to establish joint educational programmes with partner institutions across the world. These joint courses are now taking place in a number of countries (see ITC web pages at http://www.itc.nl/itc_worldwide/educationpartners.aspx). The main reason for ITC to start these initiatives is the simple fact that it is becoming increasingly difficult not only for people to leave their jobs and homes for any lengthy period of time, but also to obtain funding for overseas study. In addition, the general trends in globalisation, the rapid developments in ICT, the access to earth observation and other spatial data, the growing awareness of global environmental issues, and the benefits of sharing expertise are playing important roles. Alternative approaches must therefore be developed to pursue ITC's mandate in capacity building.

Examples

The first examples of joint courses focused on one-to-one cooperation, where partner institutes hosted copies of existing programmes. Some of these programmes were (and still are) very successful. However, views on educational practice are changing, and new methods of knowledge transfer as an alternative to the traditional face-to-face technique are gaining ground in capacity building. For instance, distance education and credit transfer are new methods of cooperation in education to facilitate the exchange of students between institutions. International cooperation and the establishment of educational networks are adding a new dimension to cross-border education. A good example is the Erasmus Mundus programme, where three or four European universities join forces and together offer one MSc programme.

These developments have led to different modalities of cooperation that make use of credit transfer, exemptions, and mutual recognition of course components, and more and more examples of cross-border education are cropping up everywhere in the world.

Problems

A growing problem facing these networks and collaboration initiatives is that diplomas and degrees are not always recognised in national educational systems. Rules and regulations in the home countries of partner institutions may differ, cannot always be combined, and sometimes are in direct conflict with one another. This is the case regarding the acceptance of double degrees and joint degrees, and minimum and maximum durations of degree programmes.

Seminar

To discuss these issues, a seminar was organised by the Group on Earth Observation (GEO) members of the International Society for Photogrammetry and Remote Sensing (ISPRS), in particular Commission VI (Working Groups 1 and 3) and ITC. The seminar took place on 1 and 2 November 2007 at ITC in Enschede.

The main aim of the seminar was to map out the problems and make an inventory of existing practices, and to formulate possible ways of addressing the problems of recognition and accreditation of these cross-border education activities

The main aim of the seminar was to map out the problems and make an inventory of existing practices, and to formulate possible ways of addressing the problems of recognition and accreditation of these cross-border education activities. This was achieved by:

- exchanging experiences of cross-border education in earth observation and geo-information
- assessing the existing gaps and defining best practices related to the recognition of diplomas and degrees and the formal accreditation of such programmes
- discussing experiences of accreditation in other scientific and educational sectors
- identifying actions that GEO, ISPRS and ITC can undertake to address the problems.

Participants

The seminar brought together providers of (international and cross-border) capacity building, such as representatives of ITC, ITC partner organisations, and the Asian Institute for Technology in Bangkok, and the directors of the Regional Training Centers affiliated to the United Nations Office for Outer Space Affairs. They discussed their experiences with experts from credential valuation agencies and from national and international accreditation organisations.

The seminar report is available on request from ITC's Communication Department (please contact pr@itc.nl).

Main Outcomes

The seminar, which was a big success, led to a number of conclusions:

- There is a lack of awareness among providers and policy makers in earth observation sectors about the problems that exist in relation to the recognition and accreditation of cross-border collaboration in capacity building.
- There is a lack of transparency in procedures and outcomes, and common international standards in relation to context, content, duration, level and expected outcomes of degree programmes are not always present.
- Legal frameworks are frequently lacking, and national legislation, as well as the rules and regulations of national accreditation bodies, are usually indecisive or unclear as to how to handle cross-border education.
- The situation for distance courses and non-degree courses is even less well described and defined.
- However, accreditation agencies present at the seminar made it clear that, provided institutions will take responsibility for proper arrangements for quality control, most of the problems can in principle be solved.

The participants came to the conclusion that there is actually no need to set up a new international agency for accreditation and/or recognition of cross-border education and that accreditation should remain the responsibility of national bodies. However, special international bodies are needed for the recognition of qualifications, including the definition of sets of standards.

In the meantime, in order to deal with the problem of recognition, ITC has announced that it will begin development on a diploma supplement that will help to clarify the content and value of the programmes, as well as illustrate the link with national systems, for grading and diploma valuation. More specific recommendations that were made at the end of the seminar are set out in the seminar report.

The cooperation between educational institutes in different countries in the form of joint programmes, double degree programmes, distance education, and other

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forms of cross-border education has seen a cautious and careful start. But clearly it is a phenomenon that will not disappear; it is definitely here to stay. And although it may take some time, proper procedures, rules and regulations for the recognition and accreditation of cross-border education will follow sooner or later.

If there are any questions about cross-border education, joint courses, or issues of recognition and accreditation, please feel free to contact:

- Ineke ten Dam (tendam@itc.nl)
- Tom Loran (loran@itc.nl).

Current Joint Courses Run by ITC and Partner Institutions

Bolivia		
Cochabamba	Universidad Mayor de San Simon	Master degree in Geo-Information Science and Earth Observation
China		
Wuhan	Wuhan University	MSc degree in Natural Resource and Environmental Management
Xi'an	Chang'an University	MSc degree in Urban Planning and Management
Europe		
United Kingdom	University of Southampton	MSc degree in Geo-information Science and Earth Observation for Environmental Modelling and Management
Sweden	Lund University	
Poland	University of Warsaw	
Italy	Universita degli Studi di Siena, Centro di GeoTecnologie	Summer School: Open Source Web-GIS for the Dissemination of Territorial Data
Ghana		
Kumasi	Kwame Nkrumah University of Science and Technology (KNUST)	MSc degree in GIS for Natural Resources Management
India		
Dehra Dun	Indian Institute for Remote Sensing (IIRS)	Postgraduate diploma in Geoinformatics
		MSc degree in Geoinformatics
		Postgraduate diploma in Geo-information Science and Earth Observation for Geo-Hazards
		MSc degree in Geo-information Science and Earth Observation for Geo-Hazards
Indonesia		
Yogyakarta	Gadjah Mada University	MSc degree in Geo-information for Spatial Planning and Risk Management
Iran		
Teheran	Khajeh Nasirodin Toosi University of Technology (KNTUT)	MSc degree in Geoinformatics
Kenya		
Nairobi	Regional Centre for Mapping for Resources for Development	Applications of Earth Observation and GIS in Integrated Water Resources Management
Njoro	Egerton University	
Addis Ababa	Addis Ababa University	
Mexico		
Aurelia	Universidad Nacional Autonoma de Mexico (UNAM)	MSc degree in Integrated Landscape Management
Netherlands		
Delft	Delft University of Technology	MSc degree in Geographical Information Management and Application
Utrecht	Utrecht University	
Wageningen	Wageningen University	
Enschede	University of Twente	MSc degree in Governance and Spatial Information Management
		Minor: Geo Data Processing and Spatial Information
Amsterdam	Royal Tropical Institute (KIT)	Short course: GIS for Tuberculosis Control
Nigeria		
Ile-Ife	Regional Centre for Training in Aerospace Surveys (RECTAS)	MSc degree in Geoinformatics
Tanzania		
Dar es Salaam	Ardhi University	Diploma in Geoinformatics

Flooding Simulations Still Rarely Used in Disaster Preparations

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For a long time now, the flood policy in the Netherlands has focused on the prevention of flooding. In this respect, the emphasis has been placed mainly on strengthening and heightening the primary dikes on the basis of legally established safety standards.

Little or no consideration has been given to the possibility that, despite these efforts, things could go wrong. It was only after the high water of 1993 and 1995 that it was realised that absolute safety against flooding cannot be guaranteed, and it would therefore be useful to give some thought to the consequences of flooding beforehand. Recent insights into the consequences of climate change for the Netherlands have simply reinforced this view.

Flooding Simulations

The first step in determining the effects of a flood has been the development of hydraulic software that enables the flood behaviour of water across a complex landscape to be simulated. These models became available at the end of the '90s and flood scenarios have been worked out for more or less all dike areas. These simulations have increased insight into the dynamics of such a disaster. In addition, the Public Works Department has developed a module that, on the basis of model results, can provide an initial estimation of the direct damage and the possible number of victims. Although these are only rough estimates and many aspects are not included in the calculation, they do confirm the view that a flood in West and Central Netherlands will lead to a catastrophe. Not for nothing is the risk of flooding once again a high priority on the political agenda. In this respect, the dike breach at Wilnes is a foretaste of what's in store.

Communication Problem

The problem that we are now up against is that hardly any use of these scientific and technological insights is being made at policy-making and implementation levels. Why are flood analyses not yet included when drafting spatial planning? And why do disaster relief teams make so little use of realistic flood scenarios in preparing their rescue operations? This is partly because there is a need for information different from that currently available. However attractive the animations, however clear the maps predicting maximum water depths and expected damage, apparently this is not the information necessary for the incorporation of flood considerations in plan formulation. Another reason is that many more aspects than simply floods have to be considered when drawing up plans and policy. Short-term interests (income) have to be weighed against something as abstract as low probability-high consequence risks (costs). Although it is clear that the risks in the deep polders of the Netherlands are significant - an observation that few would dispute - it is politically unthinkable to encourage investment there. It seems that, administratively speaking, people are unable to handle unyielding information that expresses these risks in probabilities, water depths and possible damage. The same applies to disaster relief teams, who do not know how to translate the newly acquired insights in flood dynamics into optimalising evacuation plans, for example.

Interactive Process

This problem can be remedied by more interaction between "science" on the one hand and "policy makers" and "implementers" on the other. Thus in regional landscaping, flood scenarios can be interactively worked out, making it immediately clear what the effects of certain landscape interventions will

be on the dynamics of a flood. Furthermore, it is important that all stakeholders are involved in defining the consequences of such an event because there are differences in perception (e.g. farmers versus town-dwellers or damage versus victims) when it comes to determining the seriousness of a flood. Flood scenarios can also be used as the basis for disaster relief exercises. Area-specific knowledge, expert experience, and preconditions relating to materials and infrastructure can then be included when determining possible pressure points. This requires policy makers and implementers to be able to indicate the information they need for their decisions, and scientists to have the flexibility to deliver this information.

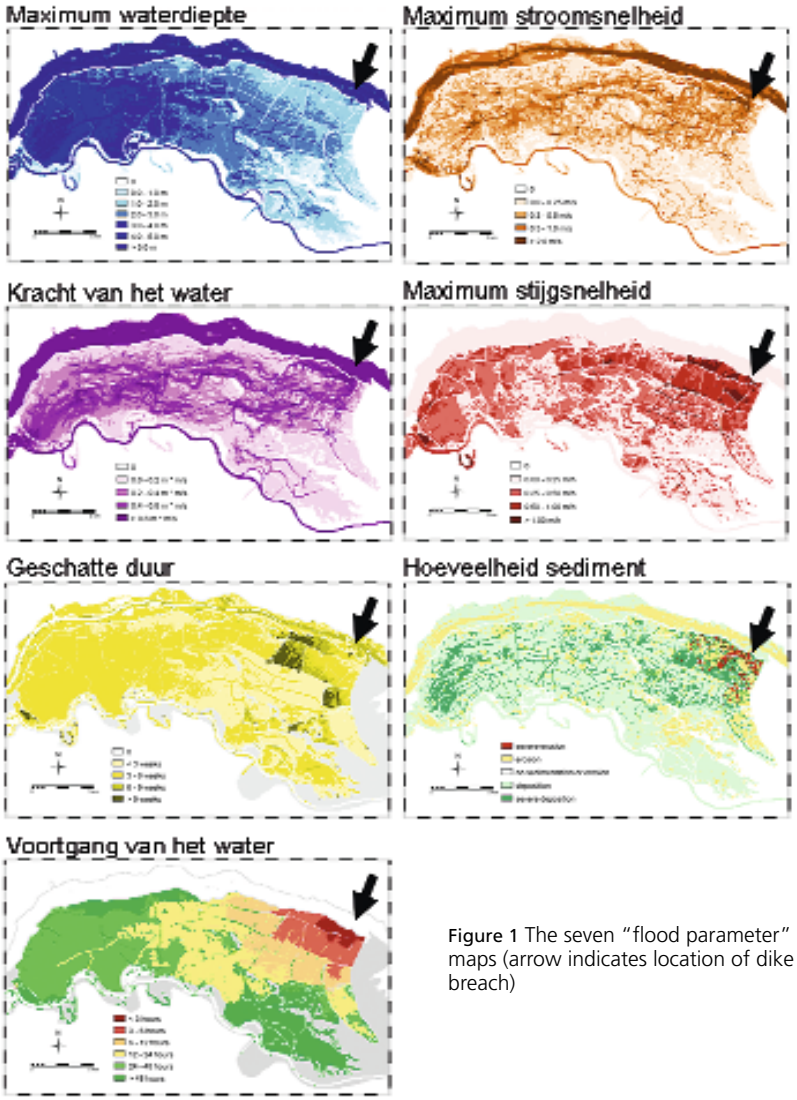

Figure 1 The seven "flood parameter" maps (arrow indicates location of dike breach)

Example:
Flooding of the *Land van Maas en Waal*
In this example, a flood scenario is worked out for the *Land van Maas en Waal* (area lying between the rivers Maas and Waal). It relates to a flood with a probability of 1:1250, as projected for 2050 on the basis of studies into the effects of climate change on the discharge behaviour of the Rhine. This is the legally defined standard that must be met by the dikes in the Land van Maas en Waal. A breach in the dike at Weurt has been simulated at the spot where a historical dike breach occurred in 1805 (see Figure 1). The computer simulation produces, after final processing, seven maps showing: (i) the maximum water depth, (ii) the maximum rate of flow, (iii) the maximum water power[i], (iv) the maximum rate of water rise, (v) the estimated flood duration, (vi) the quantity of sediment left behind, and (vii) the progress of the water across the area.

Evacuation Prioritisation
The last map in particular is very important for evacuation purposes, because it gives a picture of the time available to evacuate people at the last moment. But when it comes to prioritisation, the other six "water parameters" also play an important role, for example, in showing the ultimate height of the water or how quickly it rises. This information can contribute to evacuation prioritisation with the aid of *Ruimtelijk Multi-Criteria Evaluatie* (RMCE) (spatial multicriteria evaluation), a GIS technique used for combining maps. During the RMCE procedure[ii], the maps are rescaled and assigned weights, which calls on the specific expertise of those involved (in the case of evacuation planning, knowledge regarding minimal response time, availability of materials, number of inhabitants in the area, capacity of the infrastructure, etc.). RMCE facilitates the discussion on how all the relevant map layers must be combined. Ultimately, this results in the prioritisation of evacuation. If people agree on the intervening steps taken, then they must also agree on the end result.

i Power is water depth multiplied by rate of flow.
ii RMCE is a module in ILWIS, a GIS developed by ITC in Enschede.

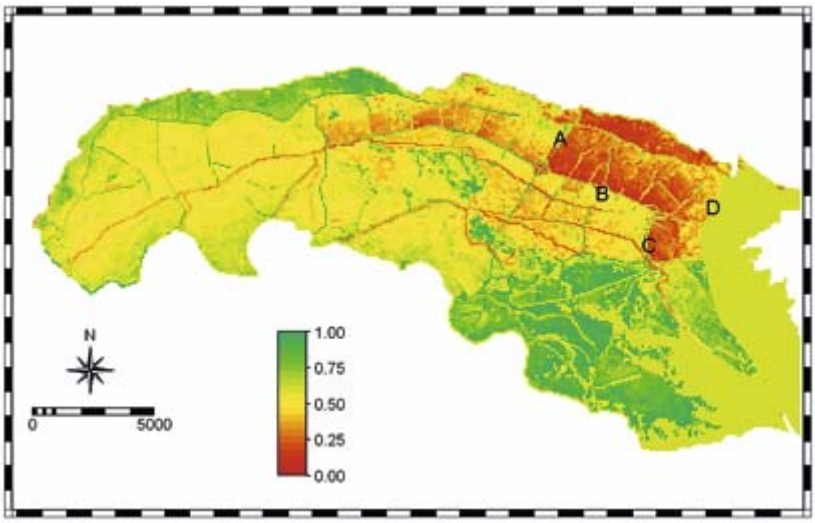

Figure 2 The letters indicate several important infrastructures that play an important role during flooding of the area (A = A50 motorway, B = A73 motorway, C = noise barrier at Nijmegen, and D = dike of the Maas-Waal canal)

Figure 2 shows an example of such an evacuation prioritisation for the simulated flood. The red areas are the most urgent, the green the least. In the analysis, considerable weight is given to warning time. This is less than six hours for the red area. But the other maps have also been included and these too contribute to the urgency: there are high rates of flow in the red area (up to more than 1 m/s), the water rises quickly (approximately 1 m/h), there are water depths up to approximately 3 metres, and water remains standing for a long period (more than nine weeks[iii]).

iii No allowance has made activating pumps.

Conclusion

There must be more interaction between scientists and implementers. Determining flood risks is an interactive and multidisciplinary business, demanding that the knowledge of all concerned be utilised. It will then emerge that there are different perceptions of risk and that the risk map can be used for different objectives. The interaction means that scientific knowledge will be combined with implementation experience, which will ultimately lead to greater insight into and involvement with the final risk map. Perhaps, in this way, computer simulations will be included in plan formulation (management, economy & law studies) and form the basis of disaster relief exercises.

On 7 September 2007, Dinand Alkema of ITC's Department of Earth Systems Analysis successfully defended his doctoral dissertation *Simulating Floods: On the Application of a 2D Hydraulic Model for Flood Hazard and Risk Assessment*

education news

Looking at Buurserzand Nature Reserve with Different Eyes

NRM/07/Group 1/18 October 2007

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On Wednesday, 17 October 2007, a fresh busload of NRM (Natural Resources Management) students from all over the world was dropped right at the entrance of Buurserzand Nature Reserve for a field trip to the reserve and the farming land nearby. We, the students, had to describe the conflicting land uses in order to gain insight into NRM issues in the Netherlands. The field trip was great. And it was very useful too, since, as the students come from different nations and have with different experiences, some different points of view emerged.

The park guide immediately warned his audience: "There are flesh-eating plants called *Ronde zonnedauw* or *Drosera rotundifolia* growing here in the reserve. This is definitely a dangerous carnivorous species. All the taller people are okay, but the smaller people should really stay in the middle of the track. Okay, let's go."

Round-leaved sundew (Drosera rotundifolia)
(Source: www.fryslansite.com)

Starting to get nervous, the group set off. Suddenly a noise came from a small bush not far from the track. Some African students were scared and stared at the bush. Was that the noise of a leopard? No, there are no leopards in Europe. But there are bears! "Guide, are there bears in this nature reserve?" The guide looked amused. And then a small squirrel ran out of the bush and climbed up a tree. Were we lucky!

"No, there are no big predators in the park," the guide explained. "And the wild goat that you saw was probably a deer. The only big animals here are some Hereford cattle, but they are very tame." However, not all the students were really convinced. When a big bull barred their path a short time later, some students gave the impressive mammal a wide berth.

Buurserzand Nature Reserve

The nature reserve is located in the southeast of Twente. It is owned and managed by the NGO Natuurmonumenten, which is one of the biggest and most powerful nature-based NGOs in the Netherlands. This NGO receives financial support mainly via the membership fees, but if they want to buy new land, the government provides financial assistance. In many countries in Asia and Africa, nature parks are owned and managed by the government, while NGOs become involved in supporting their programmes. Natuurmonumenten is planning to expand its territory and establish ecological corridors to prevent habitat fragmentation. There are two main constraints to acquiring more hectares for this purpose: finding funding to buy the land from the farmers, and the unwillingness of the farmers to sell.

Map of Buurserzand
(Source: www.natuurmonumenten.nl)

Since disturbances to the nature over the past few centuries have been too severe, the park management has adopted an intensive park restoration (reservation) programme. Restoring the park from ex-agricultural land to a semi-natural area is an "artificial" process. Human interference is considerable, but the land may have too much manure in its topsoil because of high levels of disturbance such as agricultural practices. In countries in Asia and Africa, restoration is a very natural process, not only because the soil and climatic conditions are very different, but also because people's attitude is different. In the Netherlands, nature is what the people want it to be, whereas in Asia and Africa nature can still go its own way. In Asia and Africa, humans live amidst nature and often depend on it, whereas in the Netherlands nature is simply a place to go where people can unwind from the stress of the city. This shows how different people have different philosophies regarding what "nature" is and how to manage it.

Wildlife

There are no large predators in the Buurserzand - although some of our friends had a rather horrifying encounter with a squirrel! The only predator against which the students were warned was the ferocious round-leaved sundew. Apart from the squirrels, deer and cattle already mentioned, the park is home to vipers, frogs, numerous birds, and some interesting butterfly species - although these could not be seen at this time of the year. Generally, it is difficult to see any wildlife at all because they tend to avoid people. Only the Hereford cattle can be seen regularly, but they are hardly wild animals anymore.

Farming

We all had different impressions of the farm but the most commonly shared observation was that the farm was more like a factory than a farm.

Buurserzand scenery

The farming system in the Netherlands applies very advanced technology, which, surprisingly, attracted the students because most farming systems in their home countries are managed traditionally. It is organised in the same way as a factory: all inputs and outputs are calculated, and all possible problems are predicted and precautions taken. On the farm, animals and lands are handled to achieve the highest level of efficiency. Over-production of manure can be one indicator of efficiency. Farms are managed so productively that farmers even have problems in getting rid of their manure. Market rules convert a farm into a productive factory where animals are treated like machines rather than living organisms. In this factory, farmers become workmen, cows become production units, and a computer rules the company.

Cows ruminating in the shed

Different Views and Uses of the Nature Reserve

The visit revealed differences in the students' perceptions of a nature park. Some were interested in the eating of Buurserzand natural products, such as berries, mushrooms and even squirrels, as nature parks in their countries also function as a food source for the inhabitants. In the Netherlands, however, it is often forbidden to harvest anything from nature reserves, depending on their protection status. The park ranger, for his part, emphasised the recreational value of walking, cycling and the like.

The park management seemed determined that every piece of land within its boundaries should be subject to careful management to enable nature to flourish on its own. Some students were surprised at this comprehensive approach because national park areas at home are not the object of management, and no intervention is made at all. Other parks do have a different kind of management, but it is often focused on production rather than aesthetics.

In the students' home countries, the conflicts that park managements have to deal with are different. More hectares of land may need to be conserved, more people may live in and be dependent on the nature, and more products may be expected from the nature. These require an integrated management system with distinct rules, laws, and control. This is one of the reasons that nature reserves in other countries need more staff to work in them. Some students also expected to see more staff working for the Buurserzand Nature Reserve, but in fact only a few people work there to conserve the nature. Maybe this is because they have less conflict concerning land use.

Socio-Cultural Rule

More often than not socio-cultural background defines a man's way of life. It dictates what and how you eat, the way you dress, the way you relate to others, and the way you manage natural resources. For instance, depending on where you come from, a few lessons in farm management could be learnt during the excursion to the farm. At the farm we visited, the daughter had inherited her parents' property and managed it with her husband. People were astonished and said "a man should never do this!" In most African communities, the man inherits the family property and therefore the wife joins him in managing the property. It is taboo for a man to live and work with his in-laws, as it is seen as disrespectful and a sign of laziness. Therefore, men work very hard to acquire their own property.

Conclusion

A few weeks ago, students arrived in the Netherlands from various continents, all with their own expectations about farming and nature conservation. But what remains after the first field trip to Buurserzand? Are there many striking differences? The answer is yes. There are several differences in the management of nature reserves because of different conditions and people's different mindset concerning nature. Compared with conditions in their home countries, Buurserzand has less wildlife and less biodiversity. It also has less management conflict because the nature is not for the living. It is more for recreational purposes, whereas in some countries the nature is important as a source of life. A potential source of conflict in managing a nature reserve in the Netherlands is the expansion of farming lands.

At the end of the day, it was clear that nature means different things to different people under different conditions.

Goodbye Buurserzand!
We'll never eat one of your squirrels: they're just too fast, nearly as fast as … a leopard.

Multicultural view

This article was written by the NRM/07/Group 1/18 October 2007 (Ali Aytac Emecen, Amjad Ali, Geert Borstlap, Lelyana Midora, Milkah Njoki Kahiu, Prabath Nishantha Edirisinghe Arachchige and Toru Nagayama).

research news

Visualizing the Evolution of Image Features in Time-Series: Supporting the Exploration of Sensor Data

Janneke Kalf

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On 24 September 2007, Ulanbek Turdukulov from ITC's Department of Geo-information Processing successfully defended his doctoral dissertation *Visualizing the Evolution of Image Features in Time-Series: Supporting the Exploration of Sensor Data.*

Abstract

Sensor image repositories are becoming the fastest growing archives of spatio-temporal information, and they are projected to grow even further throughout the 21st century. This continuous data flow leads to large time-series and, accordingly, geoscientists are often confronted with amounts of data that need to be explored and the phenomena present in time-series that need to be understood and modelled.

In this study, an approach to visual exploration of time-series of sensor data is proposed. The approach describes exploration as a process where attention, memory, graphics and the behaviour of the represented phenomena interrelate. It outlines a framework where graphics can assist memory and attention by representing image features and their evolution. The main role of graphics in data exploration is to facilitate memorisation and guide the visual search of sensor data. Reasons why the current graphics fall short of supporting the exploration process are also outlined. These are related to insufficient support for representation of image features.

The review is further supported by case studies of remote sensing data exploration where the users are primarily interested in identifying, tracing and perceiving the evolution of two highly dynamic image features. The cases deal with rip channels and convective clouds. Because geoscientists are primarily interested in image features, a workable solution is to focus on just these features, that is, to automatically extract and track them. For this purpose, the feature extraction and tracking algorithms used in computer vision, image processing and scientific visualisation are reviewed, and a post-processing tracking approach based on the overlap measure is adopted. Computational preprocessing is used, among other things, to generate the quantitative attributes of objects. The attributes of image features are emphasised in the visualisations with rich graphical and interactive exploratory functionality. Further, a research prototype - a multiple-view exploratory environment based on the space-time cube metaphor - is proposed. The four views of the prototype are linked and enable object brushing and view manipulation. Dynamic linking enables progressive knowledge construction because users can easily switch between spatially oriented, attribute-oriented and temporally oriented feature analysis. The interactivity supports users in searching for features of interest by sifting them to further reduce the complexity and by focusing attention on the selected objects. In particular, exploration of the essence of an object's evolution and history is supported.

It was important, however, to verify the concepts developed by user testing. A series of user tests were conducted involving expert and novice participants. Two exploratory tools were tested: "typical" animation and the research prototype developed during this study. Two case studies were used with similar sets of exploratory questions. The test participants provided faster and more complete and accurate answers when using the prototype than when using the animation. They were also more satisfied with the prototype than with the animation when answering these questions. Thus, overall, the test results supported the initial hypothesis: that representing image features and their evolution assists users in exploring the time-series of sensor data.

(center) Ulanbek Turdukulov

The full thesis can be downloaded from the ITC Library (http://www.itc.nl/library/papers_2007/phd/turdukulov.pdf) or the Utrecht University Library (http://igitur-archive.library.uu.nl/dissertations/2007-1009-202653/index.htm).

Hydrothermal Processes in the Archean: New Insights from Imaging Spectroscopy

Janneke Kalf

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On 21 September 2007, Frank van Ruitenbeek of ITC's Department of Earth Systems Analysis successfully defended his doctoral dissertation *Hydrothermal Processes in the Archean: New insights from Imaging Spectroscopy.*

Abstract

The aim of this research was to gain new insights into fossil hydrothermal systems, using airborne imaging spectroscopy. Fossil submarine hydrothermal systems in Archean greenstone belts and other geological terrains are important because of their relationship with volcanic massive sulphide (VMS) mineral deposits and their association with environments that are favourable for early forms of life. Interpretation and reconstruction of these systems is difficult because of their geological complexity. Airborne imaging spectroscopy, offering continuous spatial coverage and high spatial resolution, provides information on the presence, abundance and composition of near-infrared active minerals, and could therefore be used to obtain new geological information on the hydrothermal systems. It was applied to the Panorama VMS district in the Soanesville greenstone belt, Western Australia. Results from the analyses of 189 hand specimens showed that the wavelength position of the main absorption feature of white micas, a proxy for their Al content, varied between 2195 nm and 2225 nm. These wavelength variations and the relative abundance of white micas were used to reconstruct fossil fluid pathways from low-temperature recharge to high-temperature discharge zones. Results also showed that the absorption-wavelength variations of white micas could be mapped from airborne imaging spectroscopy, using a stochastic method where the presence of white mica minerals and their absorption wavelengths in field measurements were predicted from band ratios. Analysis of the spatial patterns in segmented images, covering 52 km^2, of white mica probability and their absorption wavelengths and their comparison with field data resulted in the identification of a regional-scale K alteration event, previously unmapped fluid pathways, and differences in hydrothermal regime between the northern and southern parts of the test area. A new methodology using airborne imaging spectroscopy for the study of hydrothermal processes in the rock record was synthesised. This methodology involves three steps: (i) the creation of maps of surface mineralogy from airborne data, (ii) the determination of the geological significance of the near-infrared detectable mineralogy, and (iii) the evaluation of spectral patterns present in the airborne imagery. The research showed that airborne imaging spectroscopy is a research tool that can be used for discovering new information about fossil hydrothermal processes.

The full thesis can be downloaded from the ITC Library (http://www.itc.nl/library/papers_2007/phd/vanruitenbeek.pdf) or the Utrecht University Library (http://igitur-archive.library.uu.nl/dissertations/2007-0921-202103/index.htm).

Frank van Ruitenbeek and his family (wife and two sons) at the reception after the PhD defence at Utrecht University. From left to right: Floris, Susan, Frank, and Robin ... who is already thinking about the topic of his future doctorate

Integration of Information Leads to Better Predictions

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Is there a method that can be of great value in solving development problems at government level? Is it possible to reduce the threat that natural disasters pose for development in many countries? In their inaugural addresses of 17 December 2007, on the occasion of accepting office as professor at the International Institute for Geo-Information Science and Earth Observation (ITC), Anne van der Veen, professor of governance and spatial integrated assessment, and Victor Jetten, professor of earth surface systems analysis, gave their scientific views on these issues.

Disastrous Predictions

The recently published United Nations Development Programme (UNDP) report *Fighting Climate Change: Human Solidarity in a Divided World* shows that natural disasters pose a direct threat to development in many countries. For a long time now, ITC has been occupied with predicting the processes that cause these natural disasters and the risks for the population. Given that in many countries capacity is too limited to allow them to do much in terms of disaster management, it is a case of predicting the risks as well as possible. This is a dangerous activity: the models that we use for this are far from being able to give good answers everywhere. The reason is the spatial variability of the landscape. There are a host of unknown factors that together determine when a downpour of rain will have disastrous consequences such as floods, erosion and landslides. One of the improvements that we are now working on is the use of high-resolution satellite images. These images contain a great deal of information from which you can gauge the reaction of the landscape. The art is to extract the information and couple it with a spatial model.

The second problem confronting us is a communication problem. The government cannot simply use the technical results of a risk prediction just like that. There is a gulf between the different parties - the academics, the population and the government - each with their own interest.

Spatial Integrated Assessment as a Consilient Exercise?

With his chair in governance and spatial integrated assessment, Van der Veen will contribute to bridging this gulf by solving policy problems with a spatial planning perspective. His method of integrated assessment is applicable not only within the academic discipline of his colleague Jetten but also within more or less all academic disciplines.

From the outset, urban and rural planning has been occupied with integrating information from various disciplines. This is no simple task: after all, each science has its own customs and its own language. So the clustering of such scientific information requires its own methodology. Integrated assessment intends to establish this methodology. The fact that spatial planning takes place within government policy gives an extra dimension to the problem. The government stands for the collective, where individuals have no clout. The aim of governance, as a new concept, is to develop policy in such a way (with information from different fields of expertise) that every stakeholder group can contribute to the thinking and to the solutions, thus increasing the support for new government measures. With this new chair, ITC is making a contribution to development issues.

Victor Jetten delivering his inaugural address

Anne van der Veen and his family at the reception after the ceremony

Alfred Stein Professor at the University of Twente

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"Predicting the passage of a forest fire from satellite images demands not only good observation but also a creative way of dealing with uncertainties. Particularly for vague concepts such those related to "global change", there are many opportunities for stochastic methods in understanding, and not solely observing, images." So said Professor Alfred Stein, chairman of the Department of Earth Observation Science, in his inaugural address as professor of stochastic image analysis at the University of Twente. "Uncertainty is not only a nuisance, but can also be an asset, if properly interpreted".

If every quarter of an hour a satellite image comes in with a shot of an area where forest fires are raging, it is surely easy to predict the passage of the fire - at least, that's the first impression. "And it can be done," argues Stein, "but the high speed of consecutive images is at the cost of spatial resolution. Because, when a single pixel represents a surface area of 9 square kilometres, what can you say then? A good predictive model takes uncertainty into account: this is understanding images instead of simply observing." This stochastic image analysis, coupled with dynamics in time, characterises Stein's discipline.

Epidemiology

The same uncertainty is found in all kinds of notions that we use every day. Take a "polluted" river: at what point is it "clean" again? If you carry out detailed measurements on a very small surface, what does this say about the whole? Stein also describes research into preventing the buruli ulcer disease in Ghana, where links have been made with the drinking water but also with the presence of a mine in the area. "It is only through the effective handling of uncertainties that the causes of death can be coupled with these environmental factors."

Intelligent

Uncertainties can be dealt with by using a fuzzy approach, which has the advantage of everyday language and also fits in with such vague concepts as environmental indicators. The stochastic approach is more firmly based and is simpler. "Ultimately, intelligent use of images also leads to better decision making," says Stein. "Managers too must factor in uncertainties if, for example, they draw up risk maps for areas."

Netwerk

Stein sees significant opportunities for cooperation, not only at national but also at international level - Europe obviously, with institutes in many countries and opportunities in Eastern Europe. ITC has enjoyed interesting cooperation for some time now with India, particularly with the Indian Institute of Remote Sensing (IIRS). "Currently we are also studying the development of tea plantations, and are trying to model the patterns of trees and forests at different scales using fractal methods." Cooperation with China is increasing and becoming more concrete. Soon ITC and Wuhan University are to get going on this theme at PhD level. We're going to look at the monitoring of uncertain objects. Moreover, we're going to analyse stochastic images coupled with the monitoring of drought in East Africa. In addition, we have joint educational programmes in geoinformatics with Ardhi University in Dar es Salaam, Tanzania, and the Regional Centre for Training in Aerospace Surveys (RECTAS), Nigeria, while cooperation with South Africa is now taking off.

The full text of the inaugural address (in Dutch only) can be downloaded from the ITC Library http://www.itc.nl/library/papers_2007/scie/stein_geef.pdf

Alfred Stein presenting his inaugural address

An updated Köppen-Geiger Climate Classification of the World Using Very High Resolution Interpolated Climate Surfaces of Monthly P and T Data from 1950 to 2000

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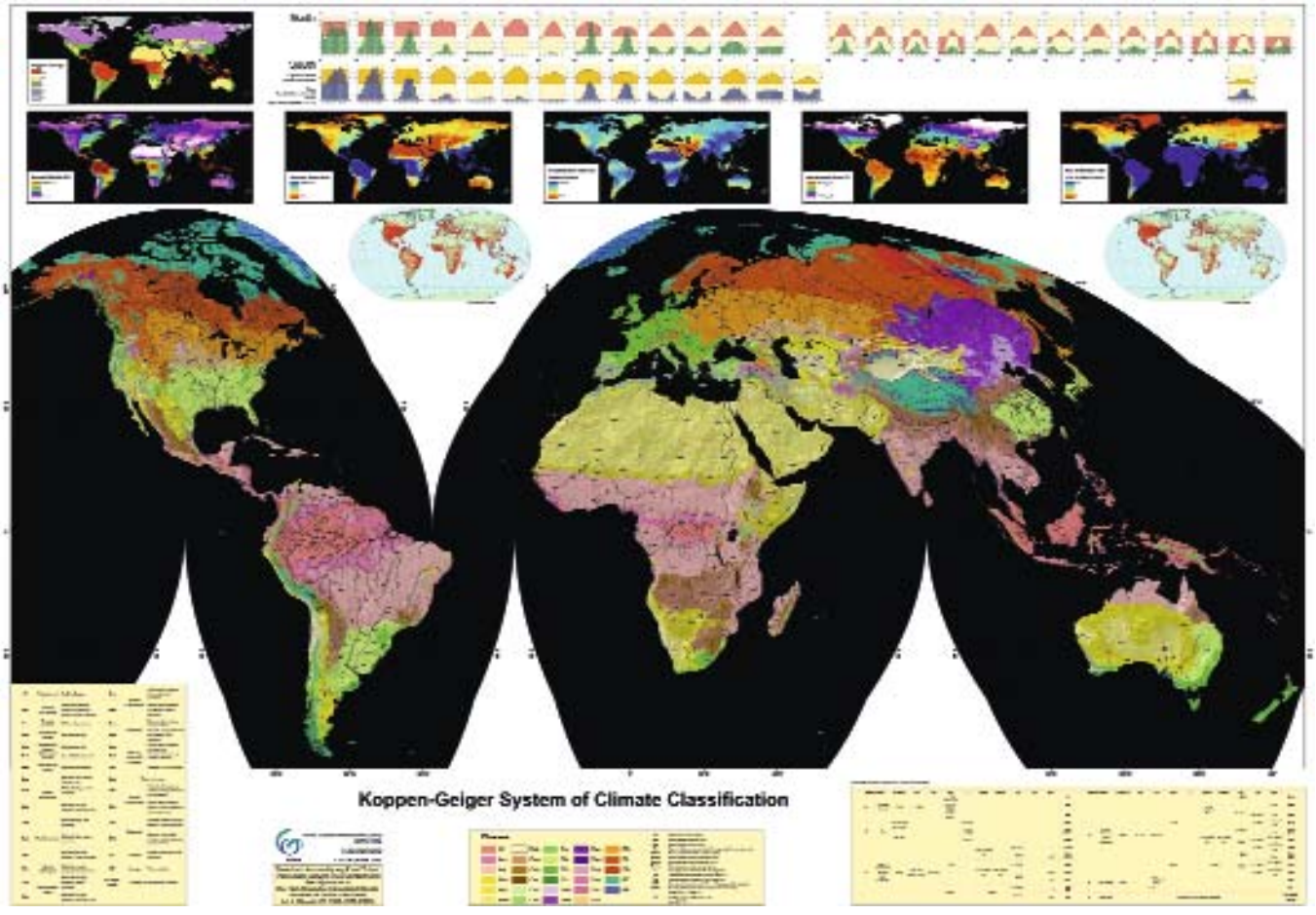
Many versions of the *Köppen-Geiger Climate Classification Map* as published in 1927 are in circulation, leading to different presentations in various standard world atlases. The differences are caused mainly by modifications to the criteria used. More variations of the map can be found when searching the internet, and comparison reveals that basically they feature poor spatial quality and incomprehensible content differences. The archives of long-term weather data that are now available call for a serious attempt to prepare a proper upgrade of the *Köppen-Geiger Climate Classification Map*, without making any modifications to the original set of criteria used to define classes. Recently, Kalkova (2003), Gnanadesikan and Stouer (2006), Kottek (2006) and Peel et al (2007) presented such attempts. The first two featured main classes only (five and 14 respectively), the last two featured only a 0.5o resolution and a non-height-dependant approach to extrapolate point-based weather records. All but the last also suffered from limited time period coverage and from a lack of access to sufficient weather station records.

The attached map is based on the output of a major effort by Hijmans et al (2005) to produce the WorldClim database, which covers the 1950-2000 period. The database contains monthly data on precipitation and mean, minimum and maximum temperatures. Hijmans et al used a thin-plate smoothing spline algorithm, implemented in the ANUSPLIN package, for interpolating weather data to monthly 1 km^2 resolution maps, using latitude, longitude and elevation as independent variables. Their summary maps with the locations of all weather stations used are shown in the attached map.

"On balance, it seems that the majority of the recent published accounts of the system show a preference for



unmodified Köppen definitions" (Wilcock 1968), however, at present various authors indicate their requirement to re-open the discussion. At ITC, the logic is different: once all primary data are available, research requirements will define the criteria to use, and thus any tailor-made climate map can be produced. As reference, the attached map still uses the original criteria of the 1927 *Köppen-Geiger Climate Classification Map* (ref: *Handbuch der Klimatologie* by Köppen and Geiger as published in 1936). The criteria used are presented as a map legend. Note that one Köppen class, i.e. the Highlands class, has disappeared. This class was originally defined by Köppen to delineate high-altitude areas lacking weather records. It was his way of avoiding proper classification.

The attached map can be downloaded from http://www.itc.nl/personal/debie/

project news

VREF Seminar on Urban Planning, Transport and the Environment

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At CEPT University in Ahmedabad, India, on 28-29 November 2007, CEPT University's School of Planning, ITC's Department of Urban and Regional Planning and Geo-Information Management, and IIT Delhi's Transportation Research and Injury Prevention Programme (TRIPP) organised a two-day seminar as part of their joint research project Land, Urban Form and the Ecological Footprint of Transport: Application of Geo-information to Measure Transport-Related Urban Sustainability. This project is financed by Volvo Research and Educational Foundations (VREF).

The two-day seminar, chaired by Assistant Professor Talat Munshi (CEPT University), was attended by some 50 participants, students and staff from CEPT University, and representatives from the Department of Urban Development, Government of Gujarat; Ahmedabad Municipal Corporation; urban planning institutes; and other municipalities, development authorities and planning corporations within Gujarat and India. The first day started with an inauguration by Shri I.P. Gautam, IAS, municipal commissioner of Ahmedabad Municipal Corporation, and speeches of welcome by the director of CEPT University, Dr Vakil, and ITC's acting rector and head of research Professor Martin Hale. An opening lecture was then given by Dr Mark Zuidgeest (ITC). This was followed by keynote lectures with discussions moderated by staff from the participating institutes (e.g. Professor Sharma, Professor Vyas, Professor Swamy, Mr Talat Munshi and Mr Ajay Katuri from CEPT University; Dr Arora from IIT Delhi; and Dr Luc Boerboom and Mr Mark Brussel from ITC), as well as invited speakers such as Shri O.P. Agarwal, Ministry of Urban Development, Government of India; Smt. D. Thara, deputy municipal commissioner and mission head JNNURM Programme, Ahmedabad Municipal Corporation; Professor A.K. Sharma, dean School of Planning and Architecture, New Delhi; and Professor Martin van Maarseveen, University of Twente, the Netherlands.

The goal of the seminar was to bring together academics, students and experts on urban planning, transport, geo-information science and urban governance, and to exchange knowl-

Keynote speaker and project partner Dr Anvita Arora (IIT Delhi) making notes during a lecture

edge and views on issues, methods and techniques related to the impacts of transport in relation to spatial planning and decision making for sustainable urban development. Keynote speakers were asked to react to the project ideas in their lectures from the different angles of urban planning, urban transport, transport modelling, environmental and social impacts, remote sensing and GIS, urban governance and decision support systems, and public transport systems. Each keynote lecture was followed by a moderated discussion among participants.

Both seminar organisers and participants were very positive about the diversity of topics discussed and how they could all be related to the single question of how to direct sustainable urban transport development. For example, it was concluded that remotely sensed imagery may provide an information resource that, when compared with traditional methods of data collection in transport planning and modelling, is likely to supply more relevant data with greater frequency and at lower cost. Therefore, it was said that transport experts should take greater advantage of this opportunity by learning how to exploit the useful properties of remote sensing data, while GIS and remote sensing experts should determine the data requirements of transport planners.

Based on the lectures, the discussions, and some project meetings (alongside the seminar programme), the VREF project partners considered the seminar to be highly successful, as they had gained a better view and understanding of how urban planning, transport and the environment are related within the context of Indian cities such as Ahmedabad, and of how state-of-the-art methods and tools such as satellite remote sensing images and transport modelling can be used to understand, control and plan transport in urban areas such as Ahmedabad. On this basis, future project activities can be fine-tuned.

The seminar also contributed to a further strengthening of relations between CEPT University's School of Planning and ITC, a point which was confirmed by both Dr Vakil and Professor Hale in their speeches. Currently, two PhD research projects are being conducted with joint supervision by CEPT University and ITC. Furthermore, three exchange students are following ITC's Urban Planning and Management MSc programme for six months, as part of their CEPT University degree.

The seminar was attended by over 50 participants from academics, institutions and government

Some seminar speakers gathered for a group photo: Professor Martin Hale (ITC), Professor Martin van Maarseveen (University of Twente), Dr Luc Boerboom (ITC), Dr Anvita Arora (IIT Delhi), Mr Mark Brussel (ITC), Mr Talat Munshi (CEPT University) and Dr Mark Zuidgeest (ITC)

Workshop on Urban Disasters and Risk Management

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Following the Volvo Research and Educational Foundations (VREF) seminar organised by CEPT University, ITC and IIT Delhi, a one-day workshop on Urban Disaster and Risk Mitigation was organised, also at CEPT University. This workshop intended to bring together various stakeholders of Ahmedabad on a single platform to discuss issues related to urban risk and how it can be reduced.

Banner displayed at the workshop venue

The programme started with the traditional Indian lamp-lighting, after which an inaugural speech was delivered by Dr R.N. Vakil, director of CEPT University. Dr Vakil spoke about the current CEPT-ITC research collaboration and highlighted the need for furthering the same. Next, Professor Martin Hale presented the SLARIM research project and introduced the three CEPT University students who will be going to ITC as a part of a student exchange under the VREF project.

The conference was attended by 21 participants from organisations such as the All India Disaster Management Institute, the Institute of Seismological Research, UNNATI (Organization for Development Education), RMSI, the School of Planning and Architecture, the Indian Institute of Remote Sensing (IIRS), and UNDP; representatives from Ahmedabad Municipal Corporation and Anna University; and academics from CEPT University and ITC. After the inaugural speeches, a keynote address entitled "Urban risk assessment of Ahmedabad" was given by Mr Ajay Katuri. This PhD project is part of SLARIM, under the joint supervision of staff from CEPT University, ITC and the Free University of Amsterdam. Keynote addresses were accordingly given by Drs Ajay K. Katuri, Dr Ali Sharifi, Dr C.N. Ray, Professor Sekhar, Professor R.J. Shah, Professor Anjana Vyas and Mr Mrugesh Raval.

The presentation by Professor R.J. Shah focused on various initiatives that CEPT University has taken since the 2001 earthquake in Ahmedabad, including damage assessment, rapid visual assessment and damage categorisation. Professor Shah further explained the methodology adopted and the lessons learned, in addition to a new methodology developed by CEPT University during the damage and loss assessment in collaboration with ADPC.

Professor Sekar of Anna University presented a study on sustainable development planning for the tsunami-affected coast of Cuddalore in Tamil Nadu, India. He described how he, along with Dr Shovan Saha (School of Planning and Architecture, New Delhi) and his students, had studied the socio-economic conditions prevailing after the tsunami and how the planning process needs to proceed. He ended with a proposal for a new land use plan.

In her presentation, Professor Anajana Vyas showed how GIS can be useful for emergency management. She presented various applications of network analysis, buffering and proximity techniques that can be used in relief and rescue operations.

Finally, participants contributed by giving their feedback and priorities on issues related to risk mitigation measures and prioritisation.


Workshop participants, CEPT University staff and students, and Dr Ali Sharifi (ITC) gather for a group photo at the end of the workshop

International Workshop Land Policies, Land Registration and Economic Development: Experiences in Central Asian Countries

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Between January 2006 and December 2007, an EU TACIS Phase 3 project in land registration was carried out in Uzbekistan (www.uzlr.uz). This project was executed by DHV Consultants in collaboration with COWI Denmark and ITC.
It was the third land registration project in support of the gradual privatisation of land and the corresponding setting up of land registration and land markets in Uzbekistan. The country is therefore transforming the Soviet registration institutions and registration systems to be able to support land privatisation and land markets. Goskomzemgeodescadastre and the National Center for Geodesy and Cartography were the beneficiary and counterpart organisations of the project.

The project had three components:
- legal development
- ICT: information processing development
- institutional development and capacity building: ITC's Johan de Meijere, as foreign expert, was in charge of this project component.

The project has been very successful and has realised all its targets, among which drafting a new registration law; purchasing and distributing registration hard- and software to all the 14 regions in the country; and providing study tours, training, and institutional support to central and regional offices involved in land registration and cadastre.

From 31 October to 2 November 2007, an international workshop was organised in the Poytaht Hotel, Tashkent, Uzbekistan, to present the project results, collate experiences in similar projects in the Central Asian countries, and outline the lessons learned over the period since independence in 1991. The workshop attracted experts from Mongolia, Kyrgyzstan, Tajikistan, Uzbekistan, Azerbaijan and Afghanistan, and experiences from Poland, Ukraine, Georgia, Serbia, Sweden, the Netherlands and France were also presented. The workshop was organised with the support of the UNU-ITC School for Land Administration Studies and sponsored by the World Bank, IFC, International Land Systems (ILS), Intergraph Polska, EuropeHouse and FIG. Johan de Meijere was the workshop facilitator.

Workshop delegate during the intensive programme

Development in Uzbekistan

In the coming months, a booklet based on the presentations and findings of the workshop will be prepared. Workshop papers and presentations can be accessed via the UNU School for Land Administration. (http://www.itc.nl/unu/la/expert_meetings.asp)

(Left) Mr Alexander Samborsky, director National Center for Geodesy and Cartography, Uzbekistan, and (right) Mr Henry Dekker, keynote speaker

announcements

Centre of Expertise in the Area of Water Systems and Governance

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The Twente Water Centre is a centre of expertise in the area of water systems and governance. The Centre is unique in bringing together and balancing the natural and social sciences. To this end, the Centre clusters together various disciplines, such as civil engineering, technology, management science and business administration, and the geo-information sciences and earth observation. Approximately 100 scientists will be employed at the Centre. The Centre, in which the University of Twente and the International Institute for Geo-Information Science and Earth Observation (ITC) are cooperating, opened officially on 11 December with the symposium Water Systems and Governance: The Big Research Questions.

The Twente Water Centre

Understanding the relation between issues of flooding, water scarcity and ecosystem changes, on the one hand, and human development, on the other, requires a multidisciplinary perspective. The Twente Centre for Water Systems and Governance adopts such a perspective in addressing broad research questions such as how do societies interfere in the natural processes? how do changes in the natural systems in turn influence human development? how do societies respond and adapt to new problems and risks? and what is or could be the role of engineering solutions? In particular, the Centre studies the institutional, social and economic mechanisms that contribute to problems of water scarcity, water quality and ecosystem deterioration and risks of flooding, the response of natural mechanisms to human interference, the impacts of water problems on societies, and the mechanisms of human response.

The programme adopts a multi-theoretical framework, which combines physical and engineering knowledge; economic theories on rational choice and efficiency; ecological theories on carrying capacity, resilience, adaptation and ecological sustainability; social theories on attitudes towards resource use and risk handling; and policy scientific theories on governance networks and self-governance. The Centre takes a step back from the classical engineering approach towards water management. Instead, engineering solutions are considered to be important elements in the study of water management that are embedded in a broader spectrum of approaches and solutions.

Official Opening

The Centre officially opened on 11 December with the symposium Water Systems and Governance: The Big Research Questions. At the official opening of this new centre of expertise, four distinguished speakers examined the major issues concerning water: Mark Dierikx, director-general Water, Ministry of Transport, Public Works and Water Management; Arie Kraaijeveld, chairman of the Netherlands Water Partnership; Johan van de Gronden, director of the World Wide Fund for Nature; and Huib de Vriend, director Deltares Knowledge and Quality Institute (formed by WLIDelft Hydraulics, GeoDelft, TNO Soil and Groundwater, and the Public Works Department).

twente WATER centre

More information on the Twente Water Centre can be found at http://www.water.utwente.nl

THE AFRICAN ASSOCIATION OF REMOTE SENSING OF THE ENVIRONMENT (AARSE)

Call for Papers

www.aarse2008.org

7th AARSE CONFERENCE – ACCRA, GHANA
27-31 October, 2008

On:

APPLICATION OF EARTH OBSERVATION AND GEOINFORMATION FOR GOVERNANCE IN AFRICA.

The **2008 ACCRA CONFERENCE** is one of the bi-annual conferences that are held under the auspices of the African Association of Remote Sensing of the Environment (AARSE). This Association was formed in 1992 in the USA, and has been a registered regional member of the International Society for Photogrammetry and Remote Sensing (ISPRS) since 1994 and an organizational member of GEOSS. AARSE is also the umbrella organization for all activities in remote sensing and GIS in Africa. One of its primary objectives is to increase the awareness of African governments and their institutions, the private sector, and society at large of the empowering and enhancing benefits of developing, applying and utilizing responsibly the products and services of geo-information technology.

The AARSE conference is the largest gathering of remote sensing and GIS users in Africa organized by Africans. The conference is a premier forum in Africa that brings together scientists, practitioners, educators, developers, vendors, and policy and decision makers to discuss the latest developments, applications, capacity building, and the promotion of geo-information technologies in the sustainable development of Africa. It is a forum in which participants learn and exchange ideas on the latest advancements in the technologies and their applications in different fields. With more than 1000 members in Africa, AARSE is the continent's best known organization, and its conference is a forum where space science and technology strategies essential for the continent are discussed.

Previous AARSE conferences:

- 1994 – Asmara, Eritrea
- 1996 – Harare, Zimbabwe
- 1998 – Abidjan, Côte d'Ivoire
- 2000 – Cape Town, South Africa
- 2002 – Abuja, Nigeria
- 2004 – Nairobi, Kenya
- 2006 – Cairo, Kenya

With its sister institution EIS-Africa, it is a major co-organizer of all bi-annual AFRICAGIS conferences. In line with its aims, the Association has also co-organized other remote sensing activities in Africa and abroad, for example, in cooperation with:

- ISPRS in 1999 in Cotonou, Benin
- ISPRS in 2002 in Dar-es Selaam, Tanzania
- ISPRS, IEEE, OGC and the University of Johannesburg (GEOSS Workshop)in 2005 and 2007 in South Africa and Burkina Faso
- AGIT in 2006 at the University of Salzburg, Austria
- UNESCO, African Union in 2007 in Paris, France.

For information concerning the 7th AARSE conference, please visit our website:
www.aarse2008.org

AARSE Website
www.itc.nl/aarse

staff news

Saskia Groenendijk Wins Henk Scholten Award 2007!

Corné van Elzakker elzakker@itc.nl

In ITC News 2007-3 you could read how the staff of the ITC International Hotel are trying to offer course participants a home away from home. That they are really managing to do so is reflected by the fact that the winner of the Henk Scholten Award 2007 is one of the hotel's receptionists: Saskia Groenendijk.

She needs little introduction to the readers of ITC News because she made her own contribution to the 2007-3 issue. What she did not say in this article is that the way in which she tries to make course participants feel at home goes far beyond the call of duty. She is always ready to listen to those in need of a sympathetic ear and she offers vitamin boosts (kiwi fruit) during thesis periods. As such, she plays a highly appreciated and very important role in the ITC community - and she has been doing so since 1 April 1999.

Because of this, Saskia really meets the qualifications for the Henk Scholten Award. After all, candidates should:

- have stimulated the "we-feeling" or have demonstrated team-building capacities at the Institute for a considerable period of time (teams usually consist of both staff and students)
- have fostered and promoted social and working relationships within the Institute as a whole for a considerable period of time
- have done this voluntarily, over and above the usual tasks resulting from their function or participation in a course programme.

The winner of the Henk Scholten Award 2007 was selected from a list of 11 candidates nominated by staff or students. The committee that invited all staff and students to submit nominations also selected the winner. The Henk Scholten Award Committee is composed of representatives of the Student Association Board (this year SAB President Marc Graham and Communication Commissioner Florence Lamptey), a representative of the PhD students (Roshanak Darvishzadeh), a representative of the Directorate (Marja Verburg), a representative of the ITC staff (Corné van Elzakker), and a representative of the personnel association InTerContact (Marga Koelen).

Amidst a storm of applause, the Henk Scholten Award 2007 was presented to Saskia Groenendijk by Rector Martien Molenaar at the start of the end-of-the-year party.

staff news

Welcome to ITC	Dr Ir T.A. Groen	Assistant professor Department of Natural Resources	15 October 2007
	Dr D.D. Navarra	Assistant professor Department of Urban and Regional Planning and Geo-information Management	1 November 2007
	Drs F.A. Fokkens	Management assistant IT Department	1 November 2007
	L.V. Nijland	Web coordinator Communication Department	7 November 2007
	Dr U.D. Turdukulov	Lecturer Department of Geo-information Processing	5 December 2007
Staff leaving	Dr M.F. Morgan	Department of Earth Observation Science	5 October 2007

Emile Dopheide and David Rossiter: Winners of the ITC Education Award 2007

Janneke Kalf

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The ITC Education Award, which is presented every two years, was established in 1997 by the Foundation at the request of the Directorate. The aim was to stimulate the quality of education and recognise creativity and innovation in this field.

This year four names were submitted to the committee (composed of student member Sibonile Sibanda; previous winners Chris Paresi, Sherif Amer, Rolf de By, Joan Looijen and Klaus Tempfli; Jeroen Jansen of Personnel & Organisation; and Marie-José Verkroost of the Bureau Education Affairs).

Needless to say, it was a very difficult choice for the Committee, since all four candidates were of high quality. The committee considered two of these nominees to be equally eligible for the award, as they both met all four criteria at a very high level but in different ways. The Board of the Foundation decided to follow this advice and present the award to two staff members *ex aequo* this year.

"The first winner, Emile Dopheide, has been innovative and creative in the design and teaching of several educational modules and the new MSc programme. His course has been used throughout ITC as a model for the re-design of other courses and the new MSc structure. Next to his management tasks as course director, he has also been involved very successfully in teaching for many years. He is considered by students as a stimulating teacher who stands for high-quality education. He supports students inside and outside the classroom and is always open for comments and feedback. His motivation for education is truly felt by the students. As a colleague he is a team player. He has a calm but decisive working approach which is nice to work with. He is social and always in for a laugh."

"The second winner, Dr David Rossiter, has given research a prominent place in the MSc curriculum. He has brought research and education closer together. The new research skills module in the MSc curriculum is based on his innovative work. He has taught for many years and guided many MSc thesis and PhD students. His distance course on Geo-statistics is famous and well-received by students both inside and outside ITC. This summer he managed to handle 71 students unaided while giving students the feeling that they received individual attention and help. Students feel that his door is always open for them and he is always willing to help. He has also many contacts with students outside ITC opening hours. As a colleague he is stimulating through his critical attitude and his willingness to look beyond existing practices and ideas."

Professor Molenaar presenting David Rossiter and Emile Dopheide, the worthy winners of the 2007 ITC Education Award, with a diploma and a cheque

In Memoriam: Rino Cahyadi Giyanto (1983-2007)

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We all know that life and death are close together, but I never could have thought that saying goodbye to Rino in the best of spirits last August in Indonesia would be our final words. Rino Cahyadi (23 years old) was an MSc student following the joint educational course on Geo-information for Spatial Planning and Risk Management run by ITC and the Geographical Faculty of the Gadjah Mada University (UGM) in Jogyakarta, Indonesia.

A few days before our goodbyes, all course staff and students were invited to the home of his parents-in-law to celebrate the birth of his first child. This son was born in June, just one day after Rino had returned home from a three-month stay in Enschede. With over 30 people in the room, we were a very happy gathering, sustained by a lot of delicious Indonesian food.

As his ITC supervisor, I got to know Rino during his stay in Enschede as a highly motivated student, with a gentle and social character. He really was one of the best in his group. His MSc thesis subject was the modelling of tsunami impact along the South Java coast, for which he had already collected many detailed terrain data in the field. During one of the field trips, we went together to a small beach town that had been severely damaged by the tsunami at the end of 2006. Here he planned to measure the depth of the sea in front of the coast. To do so, he would have had to go out in a small boat, but I advised him strongly against this because of the danger involved (people regularly drown there). So he dropped the plan.
During fieldwork, besides doing his own research, Rino was also helpful to his fellow students and supervising staff in his capacity as assistant lecturer in geography at UGM. An almost a professional chauffeur, he used to drive staff and students through the field in a huge Ford terrain car.

In November, Rino got the chance to attend a two-day international conference in Thailand on Natural Disaster Mitigation in the Coastal Regions of Tropical Asia, supported by the Japanese Nagoya University. Just before his departure to Thailand, Rino impressively presented the results of his research during an MSc mid-term evaluation session at UGM. Together with three UGM senior scientific staff members, he presented a paper on his tsunami research on the first day of the conference. The paper was very well received. An excursion was planned to the coast the following Sunday.

The day after the conference ended, ITC received the shocking news of Rino's death on Sunday, 4 November. The field trip by boat to Pattaya included a visit to an industrial area along the coast that had disappeared under water owing to land subsidence. On the way back, the base of the boat hit an object under the water and sank. Besides Rino, two participants from Thailand also drowned in this tragic accident. Rino was a good swimmer but was apparently taken by the current. The other participants, including three from Indonesia, had a narrow escape.

The funeral was attended by several hundred people, including the rector of Gadjah Mada University.
Dr Rossiter, who happened to be in Jogyakarta, offered condolences to the widow, parents, siblings and UGM officials on behalf of ITC. At ITC in Enschede, a book of condolence was signed by many staff and students, and later presented to Rino's widow.

Winter has arrived

Ice skating event for ITC students in the Oude Markt in Enschede. "Do you remember the first time you put on a pair of skates? Did you find it difficult to stay on your feet for three minutes without holding on to something or someone? And what about the next day when your body felt stiff? Still, the 2007-2008 students certainly enjoyed themselves!"

We sure know how to throw a Christmas party at ITC! And a special guest was naturally Santa Claus, who with his helpers, distributed gifts.

Sinterklaas, or St. Nicholas, the wise old man in the red robe, decided to visit ITC again this year. Children of students and staff came equipped with good humour, some singing skills and their sweetest smiles, and in return they received presents.

At ITC we like to maintain good traditions, and the International Event is certainly one such tradition. Once again it was organised in November, and the various acts led the audience from one continent to another.

events

European Higher Education Fair in Taipei

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The Netherlands Education Support Office Taipei organised the European Higher Education Fair on 3 and 4 November 2007. ITC and the University of Twente (UT) shared a booth.
Mr Tom Mulder, policy officer, and Professor Marc Wouters represented the UT, while Lyande Eelderink and Tina Tian represented ITC. Participation was arranged through NUFFIC. The NUFFIC booths are attractive and well equipped, with a strongly Dutch character (orange flowers, windmills, etc.). The one-page ITC flyer had been translated into traditional Chinese and was distributed during the fair.

On 5 November, we organised a dinner for ITC and UT alumni. Unfortunately, the weather was atrocious that evening, so only three former students arrived. Ms Chen Hsiang Yun, an alumna of ITC's Erasmus Mundus GEM course, helped at the fair and attended the dinner.

Please visit the ITC website for the picture galleries www.itc.nl/alumni/news_events

ACRS 2007, Kuala Lumpur, Malaysia

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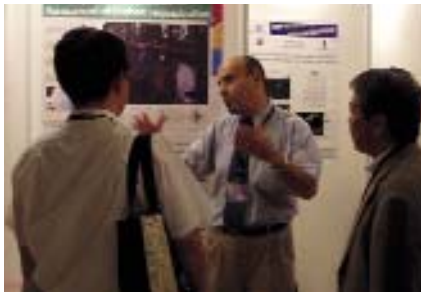
The 28th Asian Conference on Remote Sensing was held from 12 to 16 November and was well attended. The ITC booth had an attractive location opposite the MACRES booth and formed a real meeting point for conference participants. Every day we met several ITC alumni at the booth and they shared their knowledge, experiences and memories with us.

ITC Alumni Coordinator Marina Geurts expressed ITC's interest in supporting alumni to build a team for setting up an ITC alumni association in Malaysia to organise activities. Please contact the Alumni Office (alumni@itc.nl) if you would like to take a leading role in this respect.

Fifteen alumni from Malaysia and 15 more from other countries, including South Africa, Thailand, Indonesia, Iran, The Netherlands, Sri Lanka, Nepal and Mongolia

The annual conference was well attended, with a new record being set: 863 participants from 38 countries and regions

The conference secretariat headed by alumnus Jasmi ab Talib



Yousif Hussin presenting his poster

life after itc

ITC Alumni Office

Marina Geurts alumni@itc.nl

Since September 2007, I have worked as alumni coordinator in the Alumni Office with Saskia Tempelman and Jorien Terlouw. When it comes to networking events, updating contact details, services, and considerations concerning lifelong learning opportunities, this is the place to be for information and news. We consider our alumni to be valued ambassadors. That's why it is so important for them to keep in touch with us and of course with one another.

In the quarterly *ITC News*, the monthly digital ITC Update, and on our alumni website, the reports of activities show that you are having a good time together. You will find highlights of current ITC student activities and a picture gallery of former classmates mingling informally with prospective students abroad. Alumni gatherings are just one example of the opportunities to interact and exchange experiences.

World in Your Class

You had the world in your class. Why don't you show the world what you are doing now? Students are enthusiastic when they are in Enschede, in the Netherlands, in Europe. You must have felt the impact on your private and working life. We would like to work on our relationship with our 19,000 alumni, to keep on networking, and to strengthen your talent. We would encourage you to share your experiences and projects in an article or a short quote that we can publish on the ITC website or in the *ITC News*.

Alumni Events: Challenge to Stay Connected!

The Alumni Office, the ITC alumni associations, and ITC staff organise meetings, get-togethers, refresher courses and other activities for and with our alumni worldwide. You might think of involving your colleagues or stimulating your company to develop an innovative seminar in cooperation with ITC - and by doing so advance your career. We invite you to keep on brainstorming and to advise us of the possibilities.

It is important to express the appreciation we feel towards our alumni by offering them a number of privileges. Feel free to visit our alumni website and explore how you can profit from being an active member of our global network.

We wish you all the best, and hope to see you in Enschede or elsewhere in the world. In the meantime, why not visit the alumni web pages at www.itc.nl/alumni.

The ITC Alumni Office (from left to right) Jorien Terlouw, Marina Geurts, Saskia Tempelman

ITC Alumni Meet the Queen

Prof. Dr. Mahavir mahavir57@yahoo.com

It was a journey down memory lane when Professor Mahavir, an ITC alumnus (1989, 1996), and his wife Mrs Usha P. Mahavir, also an ITC alumnus (1995), met Her Majesty Queen Beatrix of the Netherlands in New Delhi, India.

As part of her state visit to India, the Queen was attending a concert, followed by a buffet reception hosted by His Excellency the Ambassador of the Netherlands in India, Mr Eric D. Niehe, on the evening of 25 October 2007. The Queen mixed with the select gathering of guests in a rather friendly environment and shared experiences of her earlier visits to India. She was accompanied by Her Royal Highness Princess Maxima. An econometrician by profession, Princess Maxima showed keen interest in knowing how remote sensing technology could be used in conducting socio-economic surveys.

The highlight of the programme was the live concert presented by the Netherlands Blazers Ensemble (NBE). The concert was a blend of traditional Dutch music and Indian ragas performed by the Indian artists Dhruba Ghosh, Niti Ranjan Biswas and Siddharth Kishna. His Royal Highness the Prince of Orange surprised everyone by taking part in a beautifully scripted skit.

Her Majesty Queen Beatrix, with the Prince of Orange, Princess Maxima and their three daughters, Catharina-Amalia, Alexia and Ariane
(© 2007 RVD: Jeroen van der Meyde)

Interview with Falak Nawaz

Marina Geurts alumni@itc.nl

***ITC News* interviewed alumnus Falak Nawaz (academic year 2000-2001) from Pakistan. Falak is country coordinator of the ITC Alumni Association of Pakistan, which was established in 2005.**

Why did you choose to study in the Netherlands, and at ITC in particular?

"I was interested in gaining admission to ITC as I wanted to make my future in GIS and remote sensing, and the Institute was located in the Netherlands. In fact, being a geographer and working as a cartographer in the Department of Geography at the University of Peshawar in Pakistan, I was involved in teaching cartography, and this subject is incomplete without knowledge of GIS and remote sensing. So you could say my enthusiasm in this respect brought me to ITC."

What are your memories of the Netherlands, Dutch food and our climate?

"It was a wonderful experience to stay and study at ITC and in the Netherlands - a lovely country with lovely people. I miss those days when

Falak Nawaz

I was at ITC. I enjoyed Dutch food, and it was also a good experience for me as a Pakistani. At home we like spicy food, which was severely lacking in Enschede. However, we tried to mix the tastes of spicy food and Dutch food. The weather was too cold for me: in my city the temperature varies between 20° and 50°C, so it was extremely cold for me in winter. Still, it was good experience - even though I was constantly suffering from toothache in winter when I was in Holland."

Any particular memories about the ITC facilities and activities that you would like to share with our readers?
"ITC has modern equipment for GIS and remote sensing, and well established laboratories and library. After returning from ITC, I can still download books and research papers from the library. The staff are very cooperative, even after the passage of seven years, and I still keep in touch with my teachers. They always reply whenever I write to them. There were a lot of activities during our stay at ITC. I enjoyed the cultural shows, the disco, and the Christmas and SAB activities. I still remember the Schermerhorn Hall, where we gathered after every module and had good fun."

Has your study at ITC contributed to your career?
"I received good exposure on my return from ITC, as in Pakistani universities there were only a few of us who had been trained in GIS and remote sensing. Also I introduced a nine-month postgraduate programme in GIS and remote sensing at Peshawar University."

Any advice for ITC?
"ITC should introduce short refresher courses at ITC periodically. Although ITC is providing opportunities in different regions, it is more advisable to bring alumni to ITC instead of to other countries. In this way, we can refresh our memories of our time at ITC."

Refresher Courses 2008

Refresher courses, which are certificate courses (mostly of two-week duration) organised for alumni in their home countries or regions, are meant to increase the impact and prolong the effect of earlier training.

Refresher courses are funded mainly by the Netherlands Fellowship Programme (NFP). In principle, the target group of these courses consists of alumni who have completed any NFP-funded training or education at least two years before the planned starting date of the relevant refresher course. Colleagues and supervisors of alumni are also allowed to participate in (part of) a refresher course. Furthermore, alumni of earlier DGIS and SAIL projects may participate.

In 2008 ITC, in association with its partners, is organising three refresher courses.

Geo-information Tools for Combating Forest Fire in Central and Southeast Asia

In cooperation with:
- Ministry of Nature and Environment (MNE)
- Forest and Water Research Centre (FWRC) of MNE

Venue and date: Ulaanbaatar, Mongolia, 19-30 May 2008
Application deadline: 15 April 2008

Decision Support Systems for Sustainable Urban Development in Eastern Africa

In cooperation with:
- Makerere University, Department of Geography

Venue and date: Kampala, Uganda, September/October 2008

Recent Developments in Geo-Hazard Disaster Management: Focusing on Earthquake Vulnerability Reduction in Mountainous Regions

In cooperation with:
- National Centre of Excellence in Geology (NCEG)
- International Centre for Integrated Mountain Development (ICIMOD)

Venue and date: Peshawar, Pakistan, October 2008

More information is available on our website (http://www.itc.nl/eduction)

FIG Workshop E-Learning 2008

International Workshop
11-13 June 2008
ITC, Enschede
The Netherlands

Sharing Good Practices: E-learning in Surveying, Geo-information Sciences and Land Administration

This international workshop brings together professionals engaged in e-learning and distance education in geo-information science and land administration. The workshop is meant to be an active event, offering the participants the opportunity to demonstrate and/or try out good practices and to share their experiences. E-learning in surveying, geo-information science and land administration in technologically less advanced countries will get special attention.

The workshop will be held at the International Institute for Geo-Information Science and Earth Observation (ITC), in Enschede, The Netherlands.

Target group

Teaching staff, instructional designers, educational managers from universities and technical training institutes engaged in surveying, geo-information science and land administration; land professionals; geoinformation providers (topographic survey institutes, cadastres, cartographic institutes), and relevant organisations and NGOs in the field of land administration and development cooperation. Participants from ITC's partner organisations in Africa, Asia and Latin America are especially encouraged to participate.

Keynote speakers

- **Prof. Stig Enemark** (President FIG) Professor in Land Management and Problem Based Learning, Aalborg University, Denmark
- **Nicholas Frunzi** Director of Educational Services, ESRI, USA
- **Prof. Paul van der Molen** (Vice President FIG) Director Cadastre International and Visiting Professor Land Administration ITC
- **Prof. Bela Markus** (Chair FIG Commission 2 Professional Education) Professor in Geoinformatics, University of West Hungary, College of Geoinformatics
- **András Osskó** (Chair FIG Commission 7) Chief advisor Budapest Land Office

Deadlines for paper submission

Submission of abstract extended	15 February 2008
Notification to authors	15 March 2008
Full paper submission	15 April 2008

Abstracts will be subject to a double blinded review process by 2 scientific committee members. All papers will be published in the FIG proceedings volume (with ISBN), on CD-ROM and on the workshop website. Selected papers will be merged into one scientific article and submitted to the International Journal of Applied Earth Observation and Geoinformation (JAG).

Registration fees

Registration fees include entrance to all technical sessions, hands on workshop, keynotes, plenary sessions and the exhibition. It also includes lunches for three days, an icebreaker, a workshop dinner and coffee/tea breaks as well as the workshop proceedings and the programme schedule.

- Early registration fee (before 15 March 2008) € 180
- Normal registration fee (after 15 March 2008) € 200
- Student participants € 100

Organising committee

- Liza Groenendijk, ITC
- Christiaan Lemmen, ITC/Cadastre, Land Registry and Mapping Agency
- Tamás Jancsó, University of West Hungary

For information, please contact

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