ISSUE 2011-2/3

ALUMNI MAGAZINE FACULTY OF GEO-INFORMATION SCIENCE AND EARTH OBSERVATION UNIVERSITY OF TWENTE

ITC NEWS





OPENING ACADEMIC PROGRAMME



NWO GRANT



You lead the way...

Explore new roads

NAVTEQ is a company of thinkers, innovators, and dreamers. A company of leaders. Talk to any of us and you will find that we are not only passionate about digital map data, but also excited about the untapped and unlimited potential of a location-enabled world. Around the globe, you can join us on our path transforming the future of informed mobility. Contact globalcareers@navteq.com today!









CONTENT

MAIN FEATURES

- 3 Opening of the Academic Year
- 6 Mapping Coral stress
- 8 Antarctica Icebergs follow krill fish

EDUCATIONAL NEWS

10 GIS and Health

RESEARCH NEWS

- 12 Satellite Images to Combat Avian Flu
- 13 Workshop on Customary Tenure

EVENTS

- 14 Modernization of Cadastres
- 16 North-South Dialogue
- 17 Workshop on Land Change Modelling

VISITS

18 Embassy of the Republic of Iraq visits ITC

ANNOUNCEMENTS

- 19 EAIE President's Award
- 20 NWO Grant
- 21 ESA-EOEP Science Review Report
- 22 ISCI Student Chapter
- 23 IAMG 2011

LIFE AFTER ITC

- 24 ITC Alumni Meet at ESRI User Conference
- 25 25th ICA Congress
- 26 ITC Alumni Associations Nepal
- 27 Nepal Academic Award
- 28 Pre-departure briefing 2011
- 29 ITC and Social Media
- 30 Complexity of Clean Drinking Water

Open-Source Geo-Spatial Software Initiative Helps to Produce Global Map of Coral Exposure to Stress (see article on page 6).

INTRODUCTION

colofon

ITC NEWS is published quarterly by ITC, Enschede, the Netherlands.

Managing Editor Janneke Kalf

Editor Jorien Terlouw

Editing Robbin Engels

Design&PrePress Composer DTPservice

Henk Scharrenborg

Printing Zalsman Zwolle B.V.

Correspondence to Managing Editor ITC News PO Box 217 7500 AE Enschede The Netherlands Phone +31 (0)53 487 44 11 Fax +31 (0)53 487 45 54 E-mail itcnews@itc.nl

ISSN

1389 9368

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

At the tail ends of the coldest ever-recorded summer in Dutch history since 1906, the Opening of the Academic Year brought a missing sunshine in the midst of early autumn winds. As tradition follows in this third issue of the year, we watch as new students from faraway lands put on their native garments that they had hand-carried in their travel luggage, proudly wearing them to the Schermerhorn Lecture (page 3) and hearing all about the various ways to select just the right model from Professor Robert Pontius of Clark University in Worchester, USA.

From diving into preserving and mapping the world's Coral Reefs (page 6) to researching on a way to combat avian flu (page 15), this issue is overflowing with research news and much more. Mostly by thinking on a multi-disciplinary plain (pgs), our researchers work hours to address, not only the needs of their own countries, but the larger issue of sustainability which citizens are facing throughout the entire world. Modernization of developing countries is a topic of concern at the heart of ITC surveyors, photogrammetrists and people working to develop low-cost technologies (page 14).

Naturally, our constant view from space allow for breakthrough research to take place in all seasons. In September, research conducted by one of our Colombian students earns the UT Msc Award, for his examination of short algorithmic patterns, revealing krill fish seem to enjoy following the path of icebergs (page 8).

In our research corner, a workshop in Delft (page 13) recognizes the success of grassroots' efforts to help citizens who live in customary communities. While collaborations with partners in the Republic of Iraq grow strong with a visit from Dr Mufeed Turkei, renewing a vital connection with the Middle Eastern partners (page 18).

Like changes in weather patterns the current educational landscape presents challenges, and no one has a crystal ball to predict the future or forecast how new efforts to fund our educational programmes will pan out. Yet inside our faculty, the bright outlook of staff and researchers, as we turn the corner of our 60-year-long history, remains noteworthy, if not comforting. Our six-decade-long past exploration of the world continues and allows us all to keep finding the hidden treasures in the exciting territory of Geo-science. This issue is evidence of our constant, soft global footprints on the earth - so while you sip tea in Nepal or elsewhere on the planet, make time to carve out a part of your day to peek between the folds of these pages.

Virtually yours,

Janneke Kalf Managing Editor Jorien Terlouw Editor



OPENING ACADEMIC PROGRAMME 2011

Joost Bruysters

itcnews@itc.nl



ust before the clock stroke of three o'clock and accompanied by the sound of organ music, people slowly entered the majestic Grote Kerk on the Old Market in Enschede - from teachers to guests of ITC to new students who came dressed in traditional garments from their country of origin.

It was Thursday 22 September, when the Faculty of Geo-Information Science and Earth Observation (ITC) of the University of Twente celebrated its official opening of the academic year. A long procession of professors in black robes, along with their entourage, had entered the church following the beadle. Dean Tom Veldkamp ascended to the altar and welcomed everyone, "If we say we will start at three o'clock then we start at three o'clock. This is, after all, a typical Dutch tradition".

In a time-honoured manner, the Faculty's opening of the academic year 2011-2012 has dated back to the exact year and day, located at the same place in the Grote Kerk at the Old Market in Enschede. The combination of serious professors in their black gowns and students dressed in colourful, exotic clothing exhibited what ITC stands for: solid science and education in an international context.



ITC students who came dressed in traditional garments from their country of origin

The students were welcomed during the official opening of the faculty's academic year by Dean Tom Veldkamp and Mr Ragindra Man Rajbhandari, president of the Student Association Board. The Dean granted the ITC Research Award, the prize given for the PhD student who has published the best scientific article last year. Following a musical interlude, it was time for the highlight of the day: The Schermerhorn lecture, the first official lecture of the academic year. Professor Robert Gilmore Pontius of Clark University in Worcester, USA, gave the lecture in his own distinctive style.

Welcome Speech Tom Veldkamp

Dean Veldkamp welcomed the attendees at the launch of the academic year of the Faculty, especially the 120 new students from 36 different countries. "The opening is mainly for students which will be the main focus of my opening speech". Veldkamp briefly addressed the sixty-one-year history of ITC during which the name of the institute has been changed five times. Since the foundation of ITC, the institute has adapted to a changing global environment and emerging new technologies stated Veldkamp.

Where in the first years we focused only on two-dimensional maps, we now have started to focus on making and using multiple-dimensional maps. In addition, our academic disciplines have gained momentum with the rising influx of available data and because of the Internet, smart phones and social media.

As more and more information becomes available, it is important for students to learn how to correctly interpret information. "During your education at ITC, you will gain the knowledge, skills and expertise to do so", assured Veldkamp. He showed his audience two completely different soil maps of a location in Spain, demonstrating the importance of verifying the validity of a specific date. "These maps were generated from the same data, however the outcomes are different. The knowledge we have influenced the outcome of the research."

Additionally, he reminded students of the vital importance to know the reliability of data and the source of data. "The challenge

Dean Tom Veldkamp ascended to the altar and welcomed everyone. "If we say we will start at three o'clock then we start at three o'clock



of our educational programme is learn how to gather the appropriate data and then to apply the correct selection criteria of the data", he explained.

As an example, he cited the recent nuclear disaster in Fukushima. The Japanese Government had issued incomplete information about the spread of radioactive material that was based on an incorrect interpretation of the data. As a result, a minister communicated to the public that there wasn't information on levels of radiation in the reactor, even though the data was available. This example showed the importance of managing and typifying data in a proper way. Veldkamp; "We will teach you how to distinguish between interpretations, measurement and models."

Student Association Board

Following the speech of Veldkamp, Mr Ragindra Man Rajbhandari from Nepal welcomed students on behalf of the Student Association Board of ITC. "As students of ITC, you are automatically members of the student association. We welcome you to the ITC family". Mr Rajbhandari explained the ins and outs of ITC and



Mr Ragindra Man Rajbhandari from Nepal on behalf of the Student Association Board of the ITC. "As students of the ITC, you are automatically members of the student association. We welcome you to the ITC family"

about the extracurricular activities which they organize such as excursions, international evenings and food festivals, where everyone can get acquainted with each other's culture and culinary dishes. He advised his fellow students to share knowledge, study hard and manage their available time effectively. In conclusion, he expressed that an education at ITC is not only relevant for a student's own professional development but also for personal development through the exchange of cultural views and ideas.

ITC Research Award

As the afternoon progressed, the ITC Research Award was granted to the PhD student who had published the best scientific article last year. The annual award is sponsored by the ITC Foundation for academic achievement. Veldkamp informed his audience, "During the course of the year, out of the fifteen article submissions, six had made our short list". The finalists had been judged by a six-person jury based on a set of specific criteria, namely for the article's scientific level, multidisciplinary characteristics and practical relevance. Veldkamp commented on the small marginal difference in quality between the top three articles. Mr Tapas Ranjan Martha and Mr Xuelong Chen missed the first prize by only a slim margin, which eventually went to Mr Babak Naimi for his article entitled "Spatial autocorrelation in predictors reduces the impact of positional uncertainty in occurrence data on species distribution modelling".



The Dean granted the ITC Research Award 2011 to Mr Naimi Babak

The researchers' article was recently published in the Journal of Biogeography. The PhD student, who nominated Naimi, wrote: "I have found his work to be an impressive multidisciplinary compilation of scientific research, which utilized spatial statistics in ecological modelling to deal with uncertainty in biological data".

Schermerhorn Lecture

At the end of a reflective musical interlude, provided by soprano Evelyn Ziegler and organist Gijs van Schoonhoven, the time had come for the Schermerhorn lecture, named after the founder of ITC. The first lecture for new students was presented by Professor model's accuracy. Ultimately he stated, "My goals had been Robert Gilmore Pontius of the Clark University in Worcester, USA. Pontius arrived to the podium and started his speech with an elongated bellow: "Congrrrraaaaatulations! You have just made the best decision of your life!" He applauded students on the fact they had been accepted by ITC, where he affirmed they will receive the best education in whole world. He asked audience members to look at their neighbours and shake their hands. "You have just shaken hands with a future minister", he confided to the audience. "We expect you to be the leaders of tomorrow in your native countries. You are the hope for our future".

Pontius went on to tell the story of when he attended college and

also shook his neighbour's hand in the seat next to him. Subsequently, he showed students a photograph of his neighbour back then, Ye Qi, who was pictured in the company of the Minister of Foreign Affairs Hillary Clinton. "This is how you can end up", he predicted and smiled.

In Pontius' lecture, the primary focus was on the accuracy of models. "Scientists have a tendency to develop increasingly more complicated models of which they are extremely proud. If you ask scientist about the accuracy of their models then the answer is usually ... Uh... it's pretty accurate". Through using an experiment, Pontius demonstrated how useful it is to know the accuracy of a specific model. He compared a total of thirteen different land change models, representing different areas. The professor compared the prediction of the future made from the original model with the actual outcome of the prediction. Then he graphically illustrated the differences in errors. Sometimes changes were predicted, which never happened or vice-versa. Across the board, he admitted, many models proved to be not accurate. In six of the thirteen models, the prediction was less accurate compared to the reality of the starting position.

One might expect to feel great disappointment after presenting these types of results at an academic congress in front of fellow colleagues, however according to Pontinus, this often proves not to be true. His methods enabled the objective comparison of a reached, because while in the company of comparison scientists, we were able to communicate in an open dialogue". Pontius wanted the students to ask themselves four questions when choosing a model: "Do you understand the model? Does your audience understand the model? Can you influence the model? Is the model relevant for your research question?" In most cases, models will fail on all these questions". In conclusion, Pontius provided a list of maxims for their study year, which students should repeat to themselves every single day. "If an action is difficult, then I am probably doing it wrong. I have to work smarter, not necessarily harder. If I hope the results

A reflective musical interlude, provided by soprano Evelyn Ziegler and organist Gijs van Schoonhoven



The first lecture for new students was presented by Professor Robert Gilmore Pontius of the Clark University in Worcester, USA



go in a certain direction then I am not working on groundbreaking science. If I want to learn something, I have to be able to explain it to my colleagues".

If the students can maintain this discipline, they will manage and will have a great future ahead of them, promises Pontius. Pontius closed his lecture, showing the photograph again from the beginning of his lecture and forecasted, "Maybe you will become better known, as my fellow colleague Ye Qi, or just as famous as Hilary Clinton"



MAPPING WORLD'S CORALS AND THEIR EXPOSURE TO STRESS

Open-Source Geo-Spatial Software Initiative Helps to Produce Global Map of Coral Exposure to Stress

Valentijn Venus

venus@itc.nl

arine researchers from the Wildlife Conservation Society (WCS) and spatial ecologists from the Faculty of Geo-Information Science and Earth Observation (ITC) have created a map of the world's corals and their exposure to stress factors, including high temperatures, ultra-violet radiation, weather systems, sedimentation, as well as stress-reducing factors such as temperature variability and tidal dynamics.

The study, say the authors, will help to conserve some of the world's most important coral reefs by identifying reef systems where biodiversity is high and stress levels are low and finding ecosystems, where management has the best chance of success. Supercomputing facilities at ITC were used to generate global maps based on satellite observations and oceanographic model outputs to derive variables that reinforce and reduce stress in corals.

Once the paper had appeared online in the journal "PLoS One", it was quickly picked up by a variety of scientific magazines including, Nature, an international weekly journal of science. The authors include: Joseph M. Maina from the World Conservation Society (WCS) and a doctoral student at Macquarie University, Sydney, Australia, who graduated from the Erasmus Mundus

programme in Geo-Information Science and Earth Observation for Environmental Modelling and Management (GEM); Timothy R. McClanahan (WCS); Valentijn Venus from the Faculty of Geo-Information Science and Earth Observation (ITC) of the University of Twente; Mebrahtu Ateweberhan from the University of Warwick; and Joshua Madin from Macquarie University.

"Coral reefs around the globe are under pressure from a variety of factors such as higher temperatures, sedimentation, and humanrelated activities such as fishing and coastal development," said Joseph Maina, WCS conservationist and lead author of the study. "The key to effectively identifying where conservation efforts are most likely to succeed is by finding reefs where high biodiversity and low stress intersect." Using a wide array of publicly available data sets from satellites and a branch of mathematics known as



The map shows relative threats to corals and highlights locations where protection efforts are likely to succeed

fuzzy logic, which can handle incomplete data on coral physiology and coral-environment interactions, the researchers grouped the world's tropical coral reef systems into clusters based on the sum of their stress exposure grades and the factors that reinforce and reduce these stresses. The first cluster of coral regions-Southeast Asia, Micronesia, the Eastern Pacific, and the central Indian Ocean-are characterized by high radiation stress (sea surface temperature, ultra-violet radiation, and doldrums weather patterns with little wind), and few stress-reducing factors (temperature variability and tidal amplitude). The group also included corals in coastal waters of the Middle East and Western Australia (both regions have high scores for reinforcing stress factors such as sedimentation and phytoplankton). The second cluster-including the Caribbean, Great Barrier Reef, Central Pacific, Polynesia, and the Western Indian Ocean-contained regions with moderate to high rates of exposure as well as high rates of reducing factors, such as large tides and temperature variability.

Overall researchers found the stress factors, such as surface temperature, ultra-violet radiation and doldrums, were the most significant factors, ones that ecosystem management has no control over. What they found to be controllable in their study was the mitigation of human impact that reinforced radiation stress, and the places where managers decided to locate their protected areas. "When radiation stress and high fishing are combined, the reefs have little chance of surviving climate change disturbances because they both work against the survival

of corals that are the foundation of the coral reef ecosystem," said Dr Tim McClanahan, WCS senior conservationist and head of the society's coral reef research and conservation programme.

The study is an excellent example of how decision makers are now trying to integrate oceanographic data (analysis and model output available in formats like netCDF) with ecological data (i.e. the GPS-based observations of coral health). They usually have to find ways to convert the oceanographic data into a compatible Geographic Information System (GIS) format so they can be used in their GIS tools (e.g. ArcGIS[™] by ESRI[®]). However, current GIS tools do not handle the time varying, multidimensional datasets well enough and provide little support for time or spatial animation. Hence the authors opted instead, amongst other tools, for the open-source Integrated Data Viewer (IDV), developed by Unidata, which has a multidimensional VisAD-data model that facilitated seamless data integration and mapping of coral exposure to environmental stressors on a global scale.

Department of Natural Resources (NRS), Faculty ITC, University of Twente, The Macquarie University's Higher Degree Research (HDR), and the Wildlife Conservation Society Marine Programme contributed to the mapping project, with support from the John D. and Catherine T. MacArthur Foundation.

The authors recommended study results be used to formulate management strategies that would include activities such as fishing restrictions, management of watersheds through improved agricultural practices, and reforestation of coastal watersheds that play a role in healthy coral systems. "The study provides Marine Park and ecosystem managers with a plan for spatially managing the effectiveness of conservation and sustainability," said Dr Caleb McClennen, director of the Wildlife Conservation Society's Marine Programme. "The information will help formulate more effective strategies to protect corals from climate change and lead to improved management of reef systems globally."





Bleached coral in Indonesia due to radiation stress

MORE INFORMATION can be found at www.itc.nl/Pub/News/in2011/Sept/Global-map-of-coral-exposure-to-stress.html

Healthy reef

MOVING FLOCK PATTERNS MINED OUT OF COMPUTER ALGORITHMS

Antarctica Icebergs Follow Krill Fish

Robbin Engels

itcnews@itc.nl



nly a few days after winning the prize for the best thesis, researcher Andrés Oswaldo Calderon Romero, 32, sipped a cup of frothy cappuccino at Café Het Bolwerk. He also spilled the beans about his discovery of finding short algorithmic patterns that showed the trajectory of Antarctic icebergs follow a similar directional pattern of krill fish.

Data mining

What exactly is the field of computer data mining? "Think about smart phones and GPS devices," explained the native of Pasto, Columbia, who studied and was a lecturer at the University of Nariño in the Computer Science Department. Basically, data mining is the science of collecting the most useful information out of large computer data bases with the use of special techniques. He added, "We now have loads of graphic information available and can begin to analyze emerging patterns."

Just this month, William H. Gates III gave a talk to 1,000 students at MIT, calling this a time for "bringing the methodologies of machine learning and modelling and rich data mining into all the hard sciences." And over recent years, the field of computer science is opening wide and can be helpful in many academic disciplines: "You can track most anything. For example, the position and movements of people, cars, animals, clouds and icebergs, as we did in our case study. We try to discover and extract previously unknown patterns."

Icebergs in Antarctica

In one of his case studies on flock patterns, Romero set out to understand and confirm previous research on the influence of the speed and direction of the winds and ocean currents on the movement of icebergs. "We realized from previous research studies conducted in the UK that there is a direct relationship between patterns of icebergs to ocean currents and global climate.

By using remote sensing devices, we took aerial pictures and made a trajectory of the data to examine how groups of icebergs move together." What he found out was the movement of icebergs is seasonally affected, which confirmed previous studies, and some of the spots where icebergs move the fastest match the location of krill fish populations. Romero's investigation results could aid in further and more accurate research on the species. "You cannot put a tracking device on the fish because they are far too small for a GPS receiver. Antarctic krill represent a multimillion dollar industry and the krill in the Northern Polar regions have already been overfished. It really comes down to an environmental issue. The entire fishing industry has moved to the South Pole," explained Romero.

Sharing the same path

Looking to one day return to the Netherlands, Romero was interviewed for a PhD position in the Faculty of Electrical Engineering, Mathematics and Computer Science at the University of Twente. He has crossed his fingers for the chance to stay on at the University to further explore in the area of geo-profile driven social network enrichment. Instead of tracking icebergs, he now wants to follow the digital footprints made by flocks of human beings on the Internet: "It's really too early to say, but I hope to concentrate on discovering longer algorithm chains and use data



Ed Brinksma, UT Rector Magnificus, presented the Graduation Prize to Andrés Oswaldo Calderon Romero during the Opening of the Academic Year *Photo: Arjan Reef*



General view of the discovered flocks in the Beijing Dataset



Close-up around the region which concentrates the major number of flocks. Some universities and IT institutions are highlighted



General view of the discovered patterns in Icebergs06 Dataset. Arrows indicate the direction of the flocks



Detail of discovered flocks in Icebergs06 Dataset. Arrows indicate the direction of the flocks

mining to make predictions on the patterns of tourists who share common factors." The open position focuses on investigating online communities by user interest and to carve out trajectories within a specific domain of activity.

For the time being

As part of the Erasmus Mundus Master's programme, parts of his research project brought him over the course of 18 months to study in England, Poland and Sweden, where he found the temperatures of -20 Celsius "unbearable" in the winter months, when Scandinavian days had only a few hours of sunlight. "This was my first time in Europe. When I return to Columbia this week, I plan to work for the time being as a volunteer researcher in the GRIAS research group who are currently undertaking an investigation into new computer applications for data mining. The research project investigates finding similar patterns in women who have been diagnosed with cervical cancer."

(Source: UT Nieuws www.utnieuws.nl/english)



Visualization of the results from BFE (Left) and the proposed Framework (Right). BFE displays 448 flocks while the proposed framework 104

TO READ MORE ABOUT ROMERO'S RESEARCH at the ITC Faculty website and gain access to his full thesis: *Mining moving flock patterns in large spatio-temporal datasets using a fre-quent pattern mining approach,* visit tinyurl.com/3s63pxa



GIS and Health

Ellen-Wien Augustijn

augustijn@itc.nl

Over the past years, ITC has been actively involved to teach in research areas related to geographic information system (GIS) and applications in the health science field, which is an application domain steadily gaining momentum at the moment. Visualization and analysis of spatialtemporal epidemiological surveillance data has matured over the past decade and is used widely to gain knowledge about the spread and causes of both human and animal diseases.

Contrary to many other GIS application fields, ITC does not have in-house expertise in the field of epidemiology, and this factor alone has been the trigger for collaborations with other institutes and faculties within the University of Twente. Two examples of these collaborations are the course, "Using Geographic Information Systems (GIS) in disease control programmes", which was developed in cooperation with

the Royal Tropical Institute (KIT), specifically the Amsterdam's Department of Health, Technology and Services Research (HTSR) and with the Faculty of Management and Governance (MB) of the University of Twente.

Since 1910, KIT has been an organization that has dramatically evolved, improving the quality of health for people in low to middle income countries. It was originally founded under the name of "Colonial Institute" and established to study the tropics by promoting industry and trade. Nowadays, KIT conducts research, and gives advice on education in the fields of health and sustainable development.

Some five years ago, Stella van Beers and Mirjam Bakker, both employees at KIT, approached ITC to develop a joint course under the description, "Using Geographic Information Systems (GIS) in disease control programmes". This year for the fourth successive time, from 20 June -1 July 2011, the course has been held in two locations, Enschede and Amsterdam.

The two-week course is split into two parts, where the first week takes place at Faculty ITC and the second week in Amsterdam. In order to qualify for the programme, target participants for this course need to have a medical background, but prior work experience in using GIS is not necessary. The course offers the possibility for participants

Participant of the 2011 short course Using Geographic Information Systems (GIS) in Disease Control posing in front of the ITC building



to collect data from their country of origin/ institute. In the first weeks, through collection and visualization of the retrieved data, many of the course objectives and requirements are already achieved. In the second week, course participants focus mainly on analysis, deriving useful information via a GIS. Throughout the course, participants are supervised by a team of staff from ITC and KIT. Since the development of this course, each year the number of participants has increased, and for the first time this year, NFP fellowships were available. Next year, the course will be offered again, with high aspirations in the future to offer the course at other locations around the world.

The collaboration with the department "Health, Technology and Services Research (HTSR)" was setup about a year ago. The main focus of the department is how to increase the quality, safety and efficiency of medical care. In order to widen the scope of research at the Department, Hindrik Vondeling and Maarten IJzerman expressed their interest in collaborating with ITC. The wide network of international contacts of ITC in Africa in combination with the joint interest of ITC and HTSR in new technological developments was at the start of the joined initiatives. In September 2011, the first MSc student from HTSR will leave to work on an ITC project in Rwanda. In preparation of this research, these students had to acquire the necessary GIS skills by self-study. In the future we hope to offer other students from the University of Twente the opportunity to follow specific GIS-health related courses which may eventually grow into a joined MSc track "Geo-health".

For the future, we at ITC hope to continue and further extend the initiatives with both KIT and the department HTSR of the University of Twente, as they are excellent examples of how GIS had found its way to this very relevant application domain, and how our technical expertise can be applied to increase the living circumstances of a very vulnerable group of people

FOR MORE INFORMATION on the

course "Using Geographic Information Systems (GIS) in disease control programmes" you can check the ITC website: www.itc.nl/CourseFinder and select 'certificate courses'.

The next run of this course will take place over the period 18 to 29 June 2012. Fully online registration is already possible via the ITC website.

The course will be only able to accommodate a maximum of twelve participants, so early application is advised.





Satellite Images to Combat Avian Flu

Joost Bruysters

itcnews@itc.nl

It is not only domestic poultry but also wild waterbirds that play a significant role in the spread of the avian influenza variant H5N1. With the aid of satellite data, it is possible to create risk maps for the spread of the virus by wild waterbirds. This has been shown in research by Yali Si, who obtained her doctoral degree from the Faculty ITC of the University of Twente on 16 June.

A worldwide outbreak of the deadly avian flu variant H5N1 began in 2003. In studying the spread of the disease, the main focus has been on the transmission of the virus by domestic poultry. Yali Si's research has shown, however, that wild waterbirds also play a significant role in spreading the virus. Her research has revealed a strong correlation between the outbreak of the virus and the migration patterns of migratory waterbirds, over short as well as long distances.

Satellite images

In order to anticipate future outbreaks, it is important to be able to predict the sites at which wild waterbirds are likely to settle. Currently, there is only a vague idea of how waterbirds migrate. Yali Si has, therefore, used field tests and satellite images to investigate which grasslands are more likely to attract wild waterbirds to feed. Her research showed that the quality of the grasslands plays an important part in determining whether or not the wild waterbirds will settle. The grass should not, for example, be too long or too old, as this makes grazing difficult and reduces the relative amount of nitrogen.

Risk maps

Satellite data can be used to create risk maps, which can then show the most popular areas for wild waterbirds and indicate where the risk of spreading of the avian flu virus is the greatest. Yali Si demonstrated in her study that risk maps are a feasible method for analysis, but states more research studies need to be conducted to refine the methodology and the eventual resulting risk maps



Dr Yali Si successfully defended her doctoral thesis on 16 June 2011

YALI SI CONDUCTED HER RESEARCH under the supervision of Professor Andrew Skidmore, Professor Herbert Prins and Dr Tiejun Wang, in the Biodiversity in Fragmenting Landscape research group at the Faculty ITC. Her research project was supported by the China Scholarship Council.

For the full text of her PhD Thesis: www.itc.nl/library/papers_2011/phd/yalisi.pdf

Workshop on Customary Tenure and Innovative Land Administration

Communication Department

itcnews@itc.nl

Through tapping into a network of broad knowledge and rich expertise in the Netherlands, on the occasion of Anthony Arko Adjei PhD defense ceremony on 10 May 2011 in Delft, ITC with fellow partners: the United Nations University School for Land Administration Studies, Delft University of Technology (TUD), Kwame Nkrumah University of Science and Technology (KNUST) and the International Alliance on Land Tenure and Administration (IALTA) held a workshop on "Customary Tenure and Innovative Land Administration".

The workshop instructors gave examples of innovative land administration approaches as well as problems caused by conventional ones. Traditionally, existing tenure security within customary communities is increasingly under threat of failing. This can be partly attributable to direct outside pressures but also due to internal dynamics caused by broader developments. Nonetheless, attempts to enter customary tenure into conventional land administration systems have also run into major roadblocks. These systems tend to focus only on "main rights" and forget the complex myriad of secondary rights which often only exist to serve the more powerful and elite segments of the population, both nationally and locally. Most of the land tenure security held by the poorest and most vulnerable citizens is being threatened instead of increased by such systems. On the other hand, innovative land administration systems are emerging from the bottom-up and efforts are being made by international agencies to pilot, for example, programmes that aim to bring tenure security to all citizens who live in customary communities

Participants of the Workshop on Customary Tenure and Innovative Land Administration





Workshop: Modernization of Cadastres

Walter de Vries

devries@itc.nl

The UNU School for Land Administration Studies of the Faculty of Geo-information Science and Earth Observation of the University of Twente and the Netherlands Kadaster conducted a joint workshop on "Modernization of Cadastres" with the Regional Centre for Mapping of Resources for Development (RCMRD). The UNU School for LA sponsored the joint event with the Regional Center for Mapping of Resources for Development (RCMRD) and Geospatial Media and Communication (formerly known as GISDevelopment). The event took place on 4-5 September in Nairobi Kenya, occurring back-to-back with the Africa Geospatial Forum.

Regional Center for Mapping of Resources for Development

Twenty surveyor generals and/or directors of surveys from RCMRD member states in southern, eastern and central Africa assembled together with experts from RCMRD, UT/ITC, the Netherlands Kadaster, and the private sector in Eastern Africa (Trimble and ESRI). Ms Aida Opoku Mensah, officer-in-charge of the Development Information Services Division at the UN Economic Commission for Africa (UNECA) provided a word of welcome, and called the workshop an opportunity for the current challenges in cadastres. The workshop addressed new developments in geo-information management and geo-information technology relevant to land administration organizations. Some topics of the workshop included, amongst many others, country experiences in modernizing mapping organizations and cadastres, land information infrastructure development, e-government and land administration, inter-organizational cooperation through data sharing and open cadastres. Furthermore, the workshop facilitated the collection and sharing of

professional and scientific insights and experiences, and the reinforcement of a network of national mapping and cadastre executives in Africa with land administration educational and scientific institutes worldwide.

Current Practices of Modernization in Cadastres in Africa

The country presentations emphasized four questions:

- In which context of land tenure system does modernization take place in each country?
- Which modernization of cadastres is currently taking place in each country and in each organization?
- Which modernization is needed (yet currently not possible/feasible)?
- Which issues would require further research and capacity building for each country and organization?

In most of the represented countries, the context of modernization includes dual systems of land tenure systems. This duality concerns the simultaneous operation of systems inherited in colonial times with mostly local systems of communal and customary tenure. These historical contingencies still complicate modernization efforts. In many cases, the modernization efforts aim at legal harmonization of these two systems, together with the adoption of more sophisticated or more adaptive technology. However, implementing new laws, new organizational struc-





tures, new data-collection technologies and new information architecture at the same time remains a big challenge in practice. Therefore, more research is still needed in how to standardize and optimize procedures of cadastral surveys; how to improve cadastral information management and associated workflows; how to harmonize dual legal systems, which are fundamentally different; and finally, how to better involve stakeholders in land information management. In terms of capacity in the cadastral survey and mapping field, there is still a need for more surveyors, photogrammetrists, land registration officers, system developers and system managers, SDI specialists and people who are more acquainted with the developments of modern and low-cost technologies.

Sharing Examples and Pilots of Modernization in Other Countries

The workshop also presented a number of developments, challenges and difficulties caused by modernisation in other countries. Modernization in European countries is highly dominated by incorporation of new technologies, harmonization of laws and spatial-data access. Examples of coordination mechanisms in these processes include the European INSPIRE Directive, the EULIS portal, the Land Administration Domain Model (LADM) and the system of key registers. Examples of using new technologies include experiments with point cadastres, new GNSS survey instruments, new grid reference systems and alternative data storage and retrieval systems, for example, "the cloud". Furthermore, the growing utilization of geoICT technology by citizens opens up the possibility of voluntary geographic information and crowdsourcing. Despite

these developments even in Europe these efforts do not remain without problems and bottlenecks. As was shown at the event, the INSPIRE implementation in Europe still causes many uncertainties and challenges among national mapping agencies, and the rise of crowdsourced data may also challenge the role of cadastres of central spatial data providers. These experiences show examples from other countries cannot be copied. National contextual factors continue to play a central role in the implementation strategies of modernization in Cadastres. Hence, modernization is not an end goal of delivering technical tools, but a process of sociotechnical cultivation and adaptation.

Follow-up Activities

Various activities are scheduled to continue the discussions on modernization of cadastres. During the workshop, all participants received a CD with presentations and background documents, and also the book "Spatial data infrastructures in Context: North and South". For future cooperations, participants agreed to remain in touch after the workshop through LinkedIn. All workshop documents are going to be distributed through multiple media and channels. These include CDs, shared documents, and through the OICRF (www.oicrf.org - the study and documentation centre for cadastre, land administration and affiliated fields of interest - a central repository of cadastral documents, articles and presentations). In the near future, RCMRD is planning a similar workshop for the Permanent Secretaries from 17-18 November 2011, where the UNU School for Land Administration Studies (ITC/Kadaster) is going to attend as well. And finally, the Geospatial Media and Communication organizes a conference together with Dutch Kadaster in Amster-

dam on SDI, taking place in April 2012 (www.geospatialworldforum.org/). The Faculty ITC remains actively involved in both the educational and research areas of modernization. Research into the needs of modernization remains rooted in both the laboratory environment, building knowledge on theory building, prototyping, modelling and testing, and the organizational reality of management, including actions and examining the bottlenecks and problems. That's why the discussions and exchange of ideas between academics, teachers, managers and professionals continue to remain of crucial importance









Twenty surveyor generals and/or directors of surveys from RCMRD member states in southern, eastern and central Africa assembled together with experts from RCMRD, UT/ITC, the Netherlands Kadaster, and the private sector in Eastern Africa

North-South Dialogue on Knowledge for Water-Related Climate Change Adaptation

Masterclass at ITC

Bert Boer

boer@itc.nl

On 16 to 23 June 2011 eighteen participants, comprised of mostly young professionals from Bangladesh, Indonesia, Vietnam, Ghana, Mozambique, Kenya and the Netherlands, followed a four-day Master class in which representatives from Dutch institutions presented lectures and workshops on knowledge development for water-related climate change adaptation.

The group of professionals and academics reflected on the lectures and prepared a review about the relevancy of knowledge which helps to serve the needs of their respective countries and regions. The whole event was organized by the Knowledge Network: Sustainability, Climate & Energy, an initiative of the Dutch Ministry of Foreign Affairs to stimulate North-South dialogue on knowledge.

On 18 June, the group visited ITC, where they participated in a series of lectures followed by group discussions. The lectures dealt with several important subjects:

 Pavel Kabat (Wageningen University)

 Global perspectives/expectations for information users: how does climate change affect water availability, safety, transport, and health and energy security?

- Janette Bessembinder (Royal Netherlands Meteorological Institute) - Tailoring climate information: how can climate forecasts be better integrated into the decision making process of water resource management?
- Bob Su (ITC-University of Twente)

 Quantifying climate change impacts in data-scarce environments: how to apply earth observation of the water cycle in climate and water resources studies?
- Hans van Leeuwen (Geocycli) Integration of geo-information techniques into existing procedures, a chain approach: how to integrate water and climate geo-information into existing information management systems?

The Master class at ITC was organized in collaboration with the Covenant for Water and Climate Information Services. In the afternoon, Janneke Ettema joined in on the discussions as a resource person.

	si annon
:)	Water adaptation - local & regional Chasin scala
3	. In situ observation are generally sparse
:>	To quartify CC impact to WR, multidis
•	ciplinary approach should be taken
•	Earth obs : all factors (climatic, vesetat
• = >	"Remotely sensed data necessary to compleme In situ obs."
•=	RS data should be corrected (bins).
•••=	> Insitu + RS data (Model - Prediction
	So catellite into in data scarce region
	is critical for quantifying CC impacts
	Capacity Development for
	- duta collection
	- Real time precipitation data
	- dream obs

The lecture of Bob Su (ITC- University of Twente)

On the last day of the class during the final presentation and discussion of the class work in The Hague, a lively discussion evolved around capacity development which was ranked of the highest importance by reviewers. Capacity development is not seen as a class room study but rather as an aspect of implementation, which should be merged also with private-sector engagement. Many specific recommendations were offered in the area of knowledge and data-sharing such as more regional sharing of data and collaboration in using remote sensing data, access to real-time data for inclusion in water cycle modelling, and the importance of downscaling climate information was also stressed

Eighteen participants, comprised of mostly young professionals from Bangladesh, Indonesia, Vietnam, Ghana, Mozambique, Kenya and the Netherlands



THE AIM OF THE NORTH – SOUTH DIALOGUE IS THREEFOLD:

- To perform a "peer assist" in which Southern colleagues, along with young and upcoming professionals, review the relevance of Dutch knowledge networks on water-related climate change adaptation for the needs of developing country needs, whilst at the same time, engaging in an open dialogue and mutual exchange
- To create a better understanding and match of supply and demand of knowledge on water-related adaptation.
- To broker three-way relations on water-related climate change adaptation, among young professionals and academics who come from developing countries, as well as professionals, institutes in the Netherlands and related bilateral development programmes.

Workshop on Land Change Modelling: Calibration, Validation, Extrapolation and Interpretation

Muhammad Shafique

shaffique@itc.nl

Saleem Ullah

ullah@itc.nl

A one day workshop entitled "Land Change Modelling: Calibration, Validation, Extrapolation and Interpretation" took place on 23 September 2011 at ITC. The workshop was presented by Professor Robert Gilmore Pontius Jr. from the Graduate School of Geography at Clark University, who was invited to give the ITC Schermerhorn Lecture during the Opening of the Academic Year 2011-2012 on 22 September 2011.

Professor Pontius has extensive experience and background in creating, comparing and evaluating land-use change models. As a result, he has developed a land-use change model, denoted as Geomod that is used in the GIS software programme IDRISI, which was demonstrated during the workshop. Since 2003, the workshop has been presented in different countries around the globe.

The workshop was attended by almost 70 students and staff members who were interested in learning more on modelling. Following formal introductions, the workshop started with a comprehensive presentation and open discussion on the major requirements and criteria for selecting various models for research projects, regardless of their end-user application or specific software. Moreover, Professor Pontius pointed out the importance of land-use change detection, validation, calibration, extrapolation and interpretation of data.

In a case study he had carried out with fellow researchers in Worcester, Massachusetts, US, he showed the methodological reasons behind using land-use change evaluation, and the parameters that influence the spatial distribution of land-use changes and subsequent predictions based on the resulting data. The presentation fostered interesting and lively discussions between workshop participants and Professor Pontius on the topics of land-use changes, methods and analysis. In this respect, the presentation helped participants learn how to broaden the scope and application of land-use changes by using remote-sensing techniques and devices.

Following his lecture and presentation, participants partook in a hands-on exercise, working with the Geomod model that uses the IDRISI software programme. For this purpose, a trail version of the IDRISI software and a CD, containing workshop material, was distributed to all workshop participants. Students and staff, who attended the workshop, are entitled to a 50% discount on general, academic, or student-license copies of the IDRISI software programme.

As illustrated in the hands-on exercises, Geomod-based simulation models can be used to detect and analyze land-use changes. At the workshop, hands-on exercises showed analysis data on land-use maps from 1971 and 1885, which effectively predicted the expected land-use changes for 1999. What workshop participants discovered was that predicted land-use changes in 1999 will require further validation based on the derived land-use map from 1999.

Finally, participants learned further on how to use models to monitor land-use changes and evaluate the parameters that influence land-use changes as well as future prediction. The hands-on exercise was well received among students and staff. Bring-

ing the workshop to a close, the visiting professor and workshop participants ended on a high note with praise and thanks for the mutual exchange of knowledge and practical demonstrations

Professor Robert Gilmore Pontius Jr. from the Graduate School of Geography at Clark University





Cultural Attaché Embassy of the Republic of Iraq Visits ITC

Alfred Stein

stein@itc.nl

Faculty ITC has had a long history in terms of collaboration with the country of Iraq. For various reasons, this collaboration has somewhat declined in intensity during the past few years. But at present, the opportunities are starting to increase. The Erasmus Mundus programme also now offers opportunities to register for a short course.

On Friday 17 June Dr Mufeed Turkei, the cultural attaché embassy of the republic of Iraq, has made a visit to ITC. He was welcomed by Mrs Erna Leurink, managing director, Professor Alfred Stein, member of the faculty management team, Mr Paul Schoonackers, project officer, and Dr Yousif Hussein, an Iraqi staff member from ITC. He spent around three hours touring the building and oriented himself on the possible future educational opportunities between ITC and the Republic of Iraq. He showed a warm interest to expand current educational activities in which particular joint-educational programmes was considered favourable. During his tour through the ITC building,

he met with several students from Iraq, and he admired the positive atmosphere and pleasant working conditions. We all hope this meeting will be the beginning of the way to a renewed cooperation between ITC and the Republic of Iraq in the near future



Cultural Attaché Embassy of the Republic of Iraq in front of ITC



EAIE President's Award for Fred Paats

Communication Department

itcnews@itc.nl

On 14 September at the 2011 EAIE Conference in Copenhagen, award presenters announced Mr Fred Paats, head of education at Faculty ITC, winner of the EAIE President Award for his outstanding professional contribution and service to the EAIE.

The President's Award is given annually by the EAIE president to a person of his or her choice, independent of the regular nomination procedure of the Awards Committee. For the first time, the award was presented at the 20th Annual EAIE Conference, Antwerp, Belgium, in September 2008. Winners are awarded lifelong memberships and a lifelong fee waiver to the Annual EAIE Conference.

Since 1995, Mr Paats has been a member of the EAIE and was the chair of the Professional Section on Guiding and Supporting Foreign Students 2001-2004. He also held a position as chair of the Professional Development Committee from 2005 to 2011 The EUROPEAN ASSOCIATION FOR INTERNATIONAL EDUCATION (EAIE) is a non-profit organization whose main aim is to stimulate and facilitate the internationalization of higher education in Europe and around the world, meeting the professional needs of individuals who are active in international education. The EAIE is a member-led organization which is comprised of individual members. It has a committed membership of more than 2,300 international education professionals - from rectors to professors to international exchange coordinators. The EAIE is dedicated to serving and representing its membership.



Mr Fred Paats

Deeper Understanding of Africa: Modelling of the African Lithosphere Combining GOCE and Seismology

NWO Grant Awarded to Mark van der Meijde

Communication Department

itcnews@itc.nl

The General Board of Division for the Earth and Life Sciences (GB-ALW) has decided to award a grant in the amount of € 318,443 for the application submitted during the 2011 call for the User Support Programme Space Research's sub-programme Earth Observation which is entitled *"Deeper Understanding of Africa: Modelling of the African lithosphere combining GOCE and seismology"*, to Mr Mark van der Meijde, associate professor in the Earth Systems Analysis department of the Faculty ITC of the University of Twente.

The NWO Division for the Earth and Life Sciences (ALW) is cooperating with the Netherlands Space Office (NSO) in the programme User Support Space Research. Mainly, the aim of this programme is to provide support to researchers who have been working in the Netherlands during the preparation for use of scientific infrastructure in space and to advance high-quality research. The programme is financed by the ministries for Education, Culture and Science and Transport, Public Works and Water Management.

Summary of the Research

In turn, the research will focus on innovative applications and combined analysis of GOCE satellite gravity data compared to seismological data in Africa. Many variations in the earth's topography and distribution of mass within the earth have altered the earth's static gravitational field. Therefore, this field can be used to resolve the compositional, thermal and mechanical structure of the deep crust and upper mantle, and also elucidate fundamental aspects of tectonic processes. In this context, what is of great



The final research results could offer brand-new insights, obtained through analysis of 3D gradient GOCE satellite gravity data and integration of surface wave tomography



importance to African tectonics is the role of major cratons. Along their boundaries, successive cycles of extension, rifting, and renewed accretion have taken place over time. Moreover, cratonic roots have steep sides, extending in some cases to ≥300 km depth. These roots, therefore, play a crucial role in African tectonics and the need to understand their thickness, shape, and extent may provide insights into earlier and ongoing mantle dynamics.

In the future, the research project will focus on yet unexplained earth structures on the borders of the Congo and Kalahari craton. Hopefully, researchers will gain new revelations on the lateral and vertical extent of these cratons on the lithosphere and reveal the main source for this anomalously thick crust. In the end, the final research results could offer brand-new insights, obtained through analysis of 3D gradient GOCE satellite gravity data and integration of surface wave tomography. For this purpose, a unique seismological network will be installed to provide unprecedented seismological coverage that will strengthen the satellite gravity inversion and provide unique geodynamical and compositional information on what can be considered a previously and poorly studied region in the world

MARK VAN DER MEIJDE holds a MSc degree in Earth Sciences from Utrecht University (1998) and earned his PhD in Geophysics from the ETH, Zurich, Switzerland (2003). In the past, he has worked at the Dutch Seismological Institute (KNMI) and at the Dutch Geological Survey of the Netherlands (NITG-TNO). Since 2003, he is an assistant professor of "3D geological modelling" in ITC's Department of Earth Systems Analysis. His main research interest is to make a link between remotely sensed surface and sub-surface information. His further interest lie in the fields of application focus on geophysics, 3D geological modelling, integrating hyperspectral space and airborne remote sensing devices with seismology for geo-hazards and tectonics, and 3D environmental modelling, particularly focusing on detection of natural and manmade hydrocarbon leakages.

ESA-EOEP Science Review Report 2011

Communication Department

itcnews@itc.nl

Planned for the end of 2012, the European Space Agency (ESA) delegates requested an independent scientific assessment of the Earth Observation Envelope Programme (EOEP) in preparation for the ESA Ministerial Council when a proposal for the fourth period of the EOEP will be presented to subscription members. The review panel appointed by ESA consisted of eight members, including the Chair. They represented a wide range of scientific and technical disciplines and expertise. Professor Bob Su of the Department of Water Resources of the ITC faculty was a member of the EOEP Scientific Review Panel.

ESA Director of Earth Observation Programmes Professor Volker Liebig thanked Professor Bob Su for the vital role he played as a member on the Science Review Panel of the Earth Observation Envelope Programme MORE INFORMATION AT www.barsc.org.uk/index.php/2011/06/eoep-3-programme/

ISCI Student Chapter Thrives at ITC

Xiaogang Ma

xiaogang@itc.nl

An IAMG Student Chapter at ITC (ISCI) of the International Association for Mathematical Geosciences (IAMG) was founded by a group of enthusiastic students and staff members at Faculty ITC, University of Twente.

The mission of IAMG is to promote worldwide the advancement of mathematics, statistics and informatics in the geosciences. Several ITC staff members and students have been already active members of the association before the formal establishment of the local student chapter in June 2010. On a regular basis, ITC staff and students contribute to three academic journals that are published by the IAMG, including the Mathematical Geosciences, Computers & Geosciences and Natural Resources Research publications. In the past few decades, the journal contributions also have shown that ITC and IAMG share vast research topics in the areas of geomathematics and geoinformatics.

The ISCI serves as a gateway between mathematical geosciences and ITC students, opening many possibilities for mutual cooperation, now and in the future. Since the middle of 2010, the local ISCI Student Chapter has thrived and blossomed by providing a range of academic and social activities at ITC.

With the financial support from IAMG and supervisorial support from an advisory board, which includes Professor Alfred Stein, Professor Freek van der Meer, Dr David Rossiter, Dr John Carranza, and organizational support from the ITC Research Coordination Office, the local student chapter is able to serve a whole community of geoscientists in Enschede. Though the priority is given to ISCI members in regards to access to some of its social activities, most of its events and academic activities, are open to the whole ITC community.

The ISCI welcomes ITC students to join us and become active members of IAMG

FOR MORE INFORMATION on the activities of the IAMG and ISCI, please go to www.iamg.org and http://sites.google.com/site/isciatitc, respectively.





Xiaogang (Marshall) Ma (President ISCI)



Raul Pablo Andrada De Palomera (Vice-President ISCI)



Khamarrul Azahari Razak (Treasurer ISCI)

IAMG 2011 Travel Grant Award for ITC Student

Xiaogang Ma

xiaogang@itc.nl

Ms Sanaz Salati, a current PhD student at the department of Earth Systems Analysis, received the 2011 Travel Grant Award from the International Association for Mathematical Geosciences, allowing for her to attend and give a presentation at the IAMG 2011 Annual Conference in Salzburg.

Currently, Ms Salati is supervised by Professor Freek van der Meer and Dr Frank van Ruitenbeek at ITC, where she is studying for her PhD degree. Her PhD research focuses on mapping alterations induced by hydrocarbon seeps that use combined methods of geochemistry, field spectroscopy and hyperspectral remote sensing. Her presentation at the IAMG 2011 conference was entitled "Quantifying analysis of

spatial associations of hydrocarbon seeps with geological features". The IAMG 2011 travel grant award in the amount of USD 1,000 was awarded to her based on the academic quality of her scheduled presentation and her standing as a registered IAMG member. Ms Salati is active in the IAMG Student Chapter at ITC (ISCI, http:// sites.google.com/site/isciatitc)



Ms Sanaz Salati





ITC Alumni Meet at ESRI User Conference

Rolf de By

deby@itc.nl

Now fixed as a yearly tradition, the alumni reception, after the ESRI User Conference, was held on the rooftop terrace of the Solamar Hotel in San Diego (USA) on Wednesday 13 July.

The event had to compete with other ongoing gatherings on the same night such as the ESRI Netherlands' traditional harbour boat trip, and ESRI Germany's reception at the Hyatt Hotel. Given all the events, the turn-out of 35 people was encouraging, though not all were alumni. This year we had little time to chase ITC alumni on the conference floor, and the conference was drawing a record-high of over 13,000 attendants, therefore a few strategic invitations were also put out to relations important to ITC, such as the International Food Policy Research Institute (IFPRI), National Geographic Society, and ESRI Inc. staff.

In a short welcome speech, reception guests were informed of current affairs at and around ITC. Throughout the reception, the chemistry of people mixed well, and there were a lot of conversational exchanges between our alumni and other guests, who all enjoyed ideal weather conditions, drinks and snacks, music, and indeed later in the evening, the amazing hoola-hoop capabilities of willing participants. Guests found the evening was generally appreciated as a fine opportunity to informally gather together. In many of the conversations, people exchanged stories about their current professional affairs and positions, coming to the conclusion that we are living in exciting times. There was true concern expressed about ITC's continued future, and its potentially changing role in the context of developing economies.

Jack Dangermond did not disappoint us, and appeared just before closing time of the reception, with his party of the US federal committee for spatial data efforts, and for this reason, the reception went into overtime, by half an hour - after having quenched their thirsts, they enjoyed the chat with our alumni, especially so Jack himself, it appeared, and some of the reception guests grasped the opportunity to eternalize themselves in pixels with him



Jack Dangermond did not leave alumni disappointed and made an appearance just before closing time of the reception *(Photo: Birendra Bajracharya)*



The evening was appreciated as a fine opportunity to informally gather together (Photo: Birendra Bajracharya)

25th International Cartographic Conference (ICC)

Barend Köbben

kobben@itc.nl

On 3-8 July 2011, ITC staff members were present at the 25th International Cartographic Conference (ICC) in Paris, France. The ICC is the bi-annual conference of the International Cartographic Association (ICA), returning back this year to the location where the first general assembly of ICA took place exactly 50 years ago. By tradition, ITC is incredibly active in ICA, and this year four staff members and four PhD students attended and presented their work at the main conference or participated in one of the many connected workshops. At the conference, 1,500 visitors could attend one out of the 483 academic paper or 200 poster presentations in the scientific track. Additionally, participants could also join in any of the technical visits or look at one of the exhibitions.

During the course of the conference, ITC academic staff was involved in chairing the Exhibition Prize Jury (Corné van Elzakker) and organizing a walk-in workshop entitled "Open Source GIS & Web Cartography" (Barend Köbben). This workshop was given on joyed a lively gathering. three consecutive afternoons, and everyone at ICC 2011 Conference was invited to participate in one of the two-hour sessions to learn about Open Source tools for GIS and mapping on the Web. Starting with a short introduction, we showed through hands-on exercises how to work with tools on the Web. In turn, participants brought their laptops and we provided the theoretical concepts, applicable software and guidance. The conference materials are available at the website ICA_OSGEO-workshop. At the General Assembly of ICA, Professor of Cartography Menno Jan Kraak, who chairs the Department of Geo-Information Processing at ITC, was re-elected as vice president of ICA. Corné van Elzakker, Assistant Professor in the Department of Geo-information Processing was re-elected chair of the Use and User Issues Commission

On Tuesday 7 July, fifteen ITC alumni present at the conference were invited for a morning coffee and croissants to start off the day. ITC Staff and PhD students joined the alumni and they enjoyed a lively gathering.



Fifteen ITC alumni present at the conference were invited for a morning coffee and croissants



Group picture ITC Alumni Meet Paris

ITC Alumni Associations Nepal

Naresh Praddhan

Anish Joshi

naan69@yahoo.com

itcalumninepal@gmail.com

On 2-3 September, the ITC Alumni Association Nepal (IAAN) and the Netherlands Alumni Association of Nepal (NAAN), in association with the Royal Dutch Consulate, held two separate "Orientation and Interaction Programmes" to assist new students. On the first day, the IAAN national programme focused on providing participants, who benefit from the Netherlands Fellowship Programme (NFP), with general information about Dutch culture as well as interesting facts about institutes for higher education located in the Netherlands, where the participants will be pursing academic degree programmes.

Many alumni from respective Dutch institutes, along with executive members of NAAN and Fellowship Officer Patricia Chettri who works for the Royal Dutch Consulate, shared their rich experiences and briefed the new students on relevant issues such as travel tips, and on social and cultural lifestyle aspects of what to expect from life in the Netherlands. In the past, new students felt confused about what they needed to bring with them to the Netherlands. As a result, some people ended-up packing unnecessary belongings and items which made their travel experience uncomfortable and difficult. During the programme, the new students interacted and spoke to former students to learn exactly what is necessary to pack in their suitcases and what would be better to leave at home, along with many more helpful suggestions.

The main objective of the national orientation and interaction programme was to:

- Provide information in advance about institutes where new students will be attending from alumni.
- Teach the do's and don'ts of living in the Netherlands. In the past, new students were confused about what they needed to bring with them to the Netherlands.
- Provide the opportunity for new participants to interact with each other, get to know each other and meet other students who will be attending courses at other institutes.

Alumni and speakers answered other relevant queries from participants, who were enthusiastic about the overall programme, and all of the participants seemed On the following day, a local orientation to greatly appreciate the initiative of NAAN to provide an orientation which will assist them to make a smooth transition and plan for their trip to the Netherlands.

At the end of the programme, NAAN Chair Naresh Pradhan closed with a resounding vote of thanks to all those involved. programme for new students, who will be taking courses at ITC, took place on Saturday 3 September 2011. Specifically, the main objective of the orientation and



introduction programme was to share the past experiences of ITC alumni. In brief, ITC student participants gained a basic understanding of what to expect of student life, helping them to acclimate to their future new life and study experience in Enschede at the Faculty ITC.

The Nepalese participants of ITC 2011 courses:

- Reshma Shrestha (MSc Urban Planning Management)
- Sunil Thapa (MSc Natural Resource Management)
- Umesh Kumar (MSc Geoinformatics)
- Pradeep Sapkota Upadhyaya (MSc GIS Land Administration)
- Sunita Duwal (MSc Urban Planning Management)
- Arun Poudel (MSc Geoinformatics)
- Sanjib Kumar Sah (MSc Geoinformatics)

The IAAN wishes all the participants the best of luck and success in their studies and stay in the Netherlands \blacksquare

VIEW MORE PHOTOGRAPHS of the event posted on the IAAN website sites.google.com/site/itcalumninepal/

ITC Alumnus Receives Nepal Academic Award of the Year

Communication Department

itcnews@itc.nl

ITC Alumnus Mr Uma Shankar Panday was decorated with the Nepal Academic Award Medal-B by the Right Honourable President of Nepal on 8 September 2011 in light of the special occasions of International Literacy Day and National Education Day. He reflected back on his days spent at ITC with nostalgia and gratitude, "I am thankful to all of you for your guidance, support and encouragement!"

Also Last year an ITC Alumnus (Ganesh Prasad Bhatta) won the Nepal Academic Award Medal-B in light of the occasions of International Literacy Day and National Education Day.

Mr Shankar-Panday earned the ITC Master of Science degree in Geoinformatics in 2011 with his thesis entitled "Fitting of parametric building models to oblique aerial images". He was supervised under Dr Markus Gerke and Professor George Vosselman and graduated with the academic distinction of Cum Laude. Currently, Shankar-Panday is a Research Associate and PhD candidate at Jacobs University in Bremen, Germany

READ THE FULL TEXT of the MSc-thesis of Uma Shankar Panday: www.itc.nl/library/papers_2011/msc/gfm/panday.pdf



Mr Uma Shankar Panday was decorated with the Nepal Academic Award by the Right Honourable President of Nepal

Successful Pre-departure Briefing 2011

Stephen Widjaja

stephen.widjaja@nesoindonesia.org.id

More than 250 students and 40 Dutch alumni participated in a pre-departure event at the Erasmus Huis in Jakarta and Surabaya on 23 July 2011. The guests of honour were H.E. Mr Tjeerd de Zwaan (Ambassador of the Embassy of the Kingdom of the Netherlands), Mr Dewa Made Juniarta Sastrawan (Director for West European Affairs, Ministry of Foreign Affairs) and Mr Marrik Bellen (Director of Nuffic-Neso Indonesia).

Mr Tjeerd de Zwaan congratulated the participants with their choice to pursue their study in the Netherlands which will allow them to gain more knowledge and a broad international experience. Furthermore, he emphasized students will have an important role to play in the future, supporting an excellent bilateral cooperation between two countries, namely Indonesia and the Netherlands.

Director for West European Affairs Dewa Made Juniarta Sastrawan mentioned in his speech that students get a great opportunity to study in the Netherlands, where educational systems enjoys a worldwide reputation of quality, diversity and openness, reaching far towards the rest of the world. He hoped the students' study experiences will be beneficial for the development of Indonesia in the future.

A smaller pre-departure briefing was held simultaneously at the Surabaya office where around thirty participants, mostly self-financed students, attended the event. As was the case in Jakarta, the information shared by alumni was considered highly useful information for students who are studying abroad for the first time









More than 250 students and 40 Dutch alumni participated in a pre-departure event at the Erasmus Huis in Jakarta and Surabaya on 23 July 2011



ITC and a Growing Role for Social Media

Annemay Schepers

itcnews@itc.nl

Since 1993, Annemay Schepers has been an enrolled student at the Montessori College, Hengelo. In May of last year, she spent two weeks at the Faculty ITC, as part of her pre-university education (VWO) study programme, wanting to experience an international working environment.

The Faculty of Geo-Information Science and Earth Observation of the University of Twente has a large number of international students, who often cannot bring along their families during their study abroad. When far away from home, people try to stay in touch with friends and family in their country of origin. For quite some time, availability of fast internet connections. For the telephone has been the easiest way to communicate, but also the least expensive when calling abroad. But in recent years, many new communication services have been popping up on the Internet. Historically, emails were first used, then came instant messaging such as MSN or ICQ. Although currently, the new wave of social media has made it possible to socialize in a variety of ways via a number of different platforms, many of which are specialized in different ways of socializing. But how important are these platforms to ITC students and staff?

Most of the available forms of media at the ITC are for both professional as well as private usage. Naturally, there are the "traditional" Medias such as emails, telephones and the outlook calendars, which allow for staff and students to communicate and coordinate activities with ease, improving the quality and efficiency of work. Many communication techniques are fundamental to the large international activities occurring at ITC, such as joint educational programmes and research projects. As an example, students in Vietnam and ITC students have the opportunity to contact each other to work together on using applications like the education support platform called Blackboard. Besides these communication tools, there are a growing number of new social media platforms, which ITC students and staff do not use only professionally, but are important to them in many ways. Just think of

platforms such as Facebook or Skype, all of life to technology, making it a pleasurable which are widely used to communicate, both cheaply and easily.

Social media may not be as popular in, for example, an African country as in the Netherlands, mainly because of a scarce many African students, they need to quickly adapt and change the way they use the Internet to maintain social relations. For instance, they now use social media more often and also use different devices, which they say gives them an extremely pleasant experience.



All and all, it appears older staff and students use social media platforms only for the basic applications, mainly because they are really easy to use, handy, fast and cheap. On the other hand, the younger generation uses social media platforms for the extra application, enjoying chatting or other features they consider fun, but not vitally important. In fact, the success of social media among younger people may be based on their longer exposure early in

experience and not a struggle.

In short, social media has played a growing role in communication and considered to be more and more important to people all around the world, including at ITC, where students and staff use it on a daily basis. As proof, a good example was the connection made between Egyptian students and their families in their home country during the time of the revolution. Many students were in contact with their families every hour of the day, because they had internet service on their computers and Smartphones. In turn, the Egyptian students realized how essential social media was to them, allowing them to freely and easily contact their families at a difficult time. Schepers experiences have led her to believe, "Through my time at ITC, I realized how social media operates within an international community, and I have also realized how important social media and the Internet have become over the past years, probably more than anyone realizes"



The article was written by Annemay Schepers based on her interviews with ITC staff and students.

Complexity of Clean Drinking Water

Robbin Engels

itcnews@itc.nl

Sixteen years ago, after completing her second MSc degree in applied geomorphology and engineering geology at ITC, Dr Nasreen Islam Khan, continues to make long strides to improve human health conditions for thousands of people in her native country of Bangladesh through her research on assessing arsenic levels in privately owned tubewells.

Approximately 93% of people, who live in the area where she conducted her study, are drinking water from arsenic-contaminated tubewells and 45% of the people run the risk of experiencing potential adverse health effects during their lifetime. Nowadays, there is a general lack of cheap and available low-tech ways to decontaminate water in Bangladesh which is a big problem in most developing countries around the world. Not only geo-scientists are researching on the topic to establish accurate data on the situation, many nanotechnologists are researching new methods to find inexpensive ways to purify water using nanoparticles.

Laying the foundation through spatial variation mapping, geo-scientists can now visualize and collect data, helping to discover future solutions to curb cancer rates and other diseases associated with high levels of arsenic in drinking water and food.

Rural landscape in Bangladesh

While conducting field work, the ITC alumna happened to make the acquaintance of a friendly Australian environmental research chemist, Dr Gary Owens. The two scientists from completely different academic disciplines spent hundreds of hours together in the Munshiganj, Comilla and Manikganj Districts in Bangladesh, collecting samples of vegetables, water, rice and soil in eighteen remote villages located kilometres inland from the Bay of Bengal. In this isolated location, more than 90% of rural households source their drinking water from tubewells and more than 75% of households source their cooking water from ponds.

Some years later, when Khan had started her PhD project at the University of South Australia, the two researchers, who are now officially husband and wife, worked together on a day –to- day basis in the laboratory and the combination was magical. "He's a chemist and taught me to understand how to measure and interpret concentration levels of arsenic in the water, soil and food samples. I taught him on spatial analysis of arsenic contamination."

Only a snapshot in time

At the time of Khan's study in 2004 - 2008, she and fellow colleagues had to work with two sets of varying guidelines that were in place to establish the acceptable standards of arsenic levels present in water sources, a factor which made the study complex and difficult from the onset. "The Bangladeshi Government can make restrictions and set criterion for the construction of new tubewells. Implementation processes rely on the Government's willingness to introduce new water policies to improve the health situation for human beings". Alumna Dr Nasreen Islam Khan who was the first female president of the Student Association Board (SAB) at the ITC in 1996-1997

The World Health Organization standard has set the maximum level at 10 micrograms per litre arsenic in drinking water, while the Bangladesh Government standard is much higher, allowing for 50 micrograms per litre arsenic in drinking water. Wrongly or rightly, every year standards tend to fluctuate, affecting the results of risk assessments and scientific studies. "I think one of the reasons the Bangladesh Government does not adopt World Health Organization guidelines is due to their inability to detect low concentration levels in the field," said Owens. Without the proper analytical equipment and laboratory facilities, the Government cannot accurately test for arsenic with the current field kits which can only detect levels above 50 micrograms per litre in drinking water. As a result of this factor, Khan and Owen

Dr Nasreen Khan and her husband Dr Gary Owens





Pockets of land show the highest concentrations of arsenic levels

shipped water samples, along with soil and
food samples, to Australia for laboratory
analysis.travel long distances to fetch water be-
cause it interrupts their daily housework
Adding to the many daily demands on

Owens reflects, "Our story is only a snapshot in time and to detect low levels like 10 micrograms per litre is quite difficult and requires analytical equipment and also the proper laboratory facilities which Bangladesh doesn't have at the moment." Khan concurs, "Now if I'd go to the same tubewell and collect samples, I might have completely different results. The daily usage and management of tubewells as well as the age show an increase of arsenic in the water could contribute to this change. "It's a complex problem, related to geology, land-use, human activities and many other changing factors."

Private or community tubewells

In the remote areas of Bangladesh, the concept of community wells is not prevalent or popular, both Khan and Owens agreed, which stems from traditional cultural and religious beliefs. "Mostly water is collected by women. They don't want to

travel long distances to fetch water because it interrupts their daily housework." Adding to the many daily demands on women, carrying water requires hard physical labour. Moreover another primary issue Khan mentioned is the conservative nature and attitudes of rural dwellers compared to women who live in more developed urban areas or Western countries. Rural village women, who have access to private wells within close proximity to their house, gain freedom to multitask household chores, watch and care for children, and if needed, get water quickly.

In her presentation to enrolled MSc and PhD students, and professors during her recent visit to ITC in September, her results illustrated the large variations exist in arsenic samples extracted from tubewells, situated within close proximity to one another. Her findings represent the perfect point of departure to conduct more field studies. In the future, scientists can unravel the root causes for the discrepancy in arsenic levels found in her study. In fact, there is already evidence that arsenic concentrations tend to decrease when increasing tubewell depth.

The level of the water table may also play a major role in causing the difference. "If you have a shallower water table," she explained, "then it costs less money to construct a tubewell. A shallow tubewell costs around 5,000 Bangladeshi Takas (BDT) or the equivalent of around €44.50," while deep tubewells cost significantly more, running in the neighbourhood of 60,000 to 80,000 BDT which equals around €565.50 to €754.00, a large amount of money and out-of-reach for most rural dwellers. Ultimately, the cause of high local variability of As concentrations in groundwater will require further in-depth investigations of soil properties, geological units and landuse. The scientists concluded arsenic concentrations in groundwater varied dramatically across the rural landscape and the variation occurred even within close proximity between two separate tubewells. Owens chimed in to the discussion: "On average, most people cannot gain access to arsenic-free water, in part due to their

household income, leaving few people with the preferred option to dig a deeper well. Then it becomes the case, most unfortunately, only the richest segments of the population can afford arsenic-free water." As an alternative, he suggested, people could be motivated to build tubewells together and share expenses. Owens imagined in reality most people will ask themselves the question, "Who will get to decide where the tubewell will be placed? In so much as community tubewells make sense, most Bangladeshis relish the luxury and flexibility of owning their own tubewells located in their backyards.

Rice consumption

Besides drinking water, rice consumption contributes to the overall risk of developing an arsenic- related disease. "The rice grain accumulates arsenic through the process of irrigation. An average adult male in Bangladesh will eat 1500 grams of cooked rice per day over three meals. This fact makes you begin to realise 1500 grams is a large amount, even if the concentration level is very low. It's a lot of arsenic to put into your system on a daily basis", says Khan who is finishing her position as a postdoctoral scientist at the Swiss Federal Institute of Aquatic Science and Technology in Eawag, Switzerland.

Return to Australia

Originally from the city of Dhaka, Khan has worked as an associate professor and conducted all of her research in Bangladesh but in different fields of study. "You come across all types of different people and different challenges as an academic and scientist." Today Khan has plans to take up an appointment as a research fellow at the Australian National University in Canberra, researching and teaching in the areas of climate change, land-use change and arsenic contamination. Her main current research will be conducted in Australia, side-by-side with her research on arsenic contamination that will be conducted in Bangladesh. Still of great value, Khan said she often uses the skills she learned from her time in the Netherlands (1995-1997), including how to make schematic

maps and leadership skills she gained from her activities on student boards and councils. "ITC has always represented a highbar of measurement to compare to other places of higher learning where I've been studying over the past few years." Owens said he will be happy to finally have his wife back on the same continent, where they can enjoy time together. "Nasreen likes to relax by reading cookbooks from different countries. We eat food from different cuisine - not only Bangladeshi or Australian traditional dishes. Sometimes she starts to prepare a meal the day before guests arrive and no less than 24 hours later; we can sit down with our quests and enjoy the fruits of her labour"

Dr Nasreen Khan with her team



Photogrammetry Plant design **Environment Visualisation** is ipad friendly Laser Scanning GeoInformoris www.geoinformatics.com ormatics Remote Sensing **Terrain Analysis** Mobile Mapping -Geomatics **Spatial Data Infrastructure** The only magazine in the world that knows how to position everything

