



# Geomatics Newsletter



Volume 3 Issue 1 Week 6 2010

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## **Are you looking for an exciting research project in a LIVING LAB?**

**Come to the festive kick-off event of CLIMATE CITY CAMPUS**

*This project aims to make TU Delft campus a showcase for multidisciplinary environmental research. This is the ambition of Delft Environment Initiative.*

Today, more than half of the world's population lives in cities or urban areas. Therefore, research on climate change needs to focus more on the role of urban environment. It does not require much explanation that the TU Delft campus can be an excellent test case for the problems of urban environment that are studied here at TU Delft.

### *Laboratory for environmental research*

We want to develop multidisciplinary student projects that use the TU Delft campus and the diversity of its surroundings as a laboratory for environmental research. The aim of Climate City Campus is to bring together students from different disciplines to work on themes as environmental monitoring, modeling and visualization techniques and climate proof solutions.

### *Kick-off event*

The festive kick-off event of Climate City Campus will take place on 24<sup>th</sup> February from 13.30 to 18.00 hrs. The keynote by renowned weatherman Erwin Kroll will be followed by multidisciplinary workshops around themes like water, sustainable buildings, the role of ICT, geo-information, the dispersion of pollution and sustainable outdoor spaces. You are invited to participate, brainstorm, let your ideas be heard and carried out!

When? February 24<sup>th</sup> from 13.30 hours to 18.00 hours  
Where? New TUD Science Centrum, Mijnbouwstraat 120  
Who? Climate City Campus welcomes students from all faculties, in their Bachelors (advanced) or Masters.

## **Jantien Stoter in the picture**

After 5 years at ITC (UT), Enschede, The Netherlands, at 1<sup>st</sup> of October 2009 Jantien Stoter returned as Associate Professor to the Section GIS Technology, OTB. She fulfills this 0.5 position in combination with a 0.5 position as scientific researcher at the Dutch Kadaster. The aim of this integrated position is to realize a liaison between Kadaster (practice) and GIST (science) from which both organizations can benefit. The main topics in both positions are 3D data provision, information modeling and automated generalization.



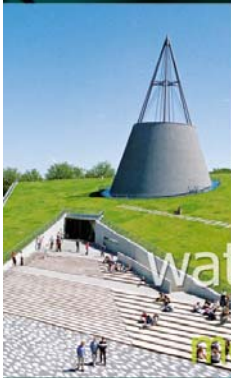
In the fourth semester Jantien is responsible for the MSc Geomatics course: Spatial Information in Utilities. The aim of this course is to present fundamental issues of spatial information technology by specifically focusing on the multidisciplinary domain of utilities. The course studies spatial information and analysis used and needed for two main utility-related tasks: 1) maintenance of utilities (including information provision to potential diggers on the exact location of utility networks to avoid damage) and 2) legal registration of utilities. Specific attention is paid to legal aspects of utilities both for avoiding damage and for legal registration, by a legal expert. In addition one lecture on water networks (i.e. drink water management) will be offered from the Faculty of Civil Engineering and Geosciences. The practicals will focus on systems for utility registration considering state-of-the-art in geoDBMS, GIS, and CAD. Two guest lectures are scheduled to inform the students on the most recent technologies and implementations.

# Kick-off!

## Climate City Campus

24 February 2010  
Science Centre TU Delft

Develop challenging research projects in a living lab  
TU Delft campus as a showcase for environmental research  
For students from all faculties  
Participate in inspiring workshops & see your wild ideas  
become reality!



water clouds  
sustainable buildings  
monitoring wind  
sustainable cities climate ICT  
geo-information

For more information & registration: Delft Environment Initiative  
[www.ccc.tudelft.nl](http://www.ccc.tudelft.nl)



Challenge the future

For more information & registration visit:

[www.ccc.tudelft.nl](http://www.ccc.tudelft.nl) / [www.environment.tudelft.nl](http://www.environment.tudelft.nl)

or contact José Knippen [j.knippen@tudelft.nl](mailto:j.knippen@tudelft.nl)

Sign up now!

<http://spreadsheets.google.com/viewform?formkey=dEdBcmJjd2ppdUZGX2ZTRmM1RXBKUVE6MA>

### Beagle, in the wake of Darwin

On September 1, 2009 the clipper 'Stad Amsterdam' started her voyage around the world in the wake of Darwin. The Beagle TV series can be seen every Sunday between 21.10 and 21.45 hours on Nederland 2. Moreover it can be followed via <http://beagle.vpro.nl/>



(Picture by Ilja)

### Graduation Colloquium

Friday February 12<sup>th</sup>, 2010

15.30 – 16.30 hours

Aerospace Engineering/Room 1

Chair: drs. Wilko Quak

15.30-15.40 hours

*Automatic segmentation and classification of movement trajectories for travel modes*

Filip Biljecki

(GIS Technology Section/OTB Research Institute/Faculty TPM)

15.40-15.45 hours Questions

15.45-15.55 hours

*Validation and automatic repair of planar partitions using a constrained triangulation*

Ken Arroyo Ohori

(GIS Technology Section/OTB Research Institute/Faculty TPM)

15.55-16.00 hours Questions

16.00-16.10 hours

*Automated Processing of High Speed Photogrammetry for Aerodynamically studies*

Dinesh Kalpoe

(Optical and Laser Remote Sensing Section/Faculty AE)

16.10-16.15 hours Questions

16.16-16.25 hours

*Assimilating GRACE Terrestrial Water Storage observations into a hydrological model*

Efstratios Tsompanopoulos

(Section of Water Resources/Faculty CEG)

16.26-16.30 hours Questions

Next: 'Geomatics' get-together in the Faculty Room

### MSc Geomatics Diploma Ceremony

On February 19<sup>th</sup> 2010, Koen Duijnmayor and Boudewijn Possel will receive their MSc diploma during the diploma ceremony. All are welcome to attend the ceremony which starts at 16.00 hours in Room F of the Faculty of Civil Engineering & Geosciences, Stevinweg 1 in Delft.

Koen's topic focused on Sediment characterization by geo-acoustic inversion of marine seismic data received on a towed hydrophone array and Boudewijn did research on Automatic detection of buried channel deposits using high resolution laser altimetry data (FLI-MAP).

We would like to congratulate Koen and Boudewijn and wish them all the best in their careers.

After the graduation ceremony the reception will be held in PSOR.

### Graduation Presentation Sven Briels

On Wednesday February 24<sup>th</sup> 2010 from 8.45 to 10.00 hours Sven Briels will give his graduation presentation on the topic 'Infrasound source location: An automated method to estimate the location of infrasound sources as detected by microbarometer array recordings in the Netherlands over 2007'.

The presentation takes place at Room F of the Faculty of Civil Engineering & Geosciences, Stevinweg 1 in Delft.

Infrasound is sound with a frequency below the human hearing threshold of 20Hz. Due to this low frequency infrasound signals experience little attenuation and can travel vast distances. By recording infrasound signals

The voyage of the Beagle has been described as probably the most important voyage ever. During this voyage Darwin (1831-1836) gained so much knowledge and insight that he changed the world view fundamentally. With his "On the Origin of Species" Darwin was the first scientist that made it clear that the world was not created in six days, but that it evolves constantly. Life on earth appears to be under development. In the Darwin year the VPRO investigates in co-operation with Teleac and the Flemish Canvas, the direction of this development. The voyage is partly supported by TU Delft and Fugro Survey. The VPRO sails again the course of the HSM Beagle with the clipper 'Stad Amsterdam'. Starting in England the expedition takes the crew across the oceans of the world, from Brazil to Patagonia, from the Andes mountain range to the Galapagos Islands and across the Pacific to Australia and Cape of Good Hope. The clipper 'Stad Amsterdam' is a sailing studio on which scientists, artists and other guests sign up.

Bert Vermeersen of the Faculty of Aerospace Engineering – Department of Earth Observation and Space Systems – will join the crew on March 14 f.c. in Perth and will be supported by Peter Boon from Fugro Survey and the Dutch TU Delft scientists Lennard Huisman, Dennis Odijk and Peter Teunissen. Fugro Survey contributes via an advanced GNSS system that has been placed on the clipper. Bert will sail to the isle of Mauritsius following in Felix Vening Meinesz footsteps. Vening Meinesz (1887-1966) – Dutch geodesist, geophysicist, pioneer in the field of gravity measurements and professor in Geodesy at TU Delft during the period 1939-1957 – made this trip in the submarine KXXIII in the period 1933-1934. More information can be found on: [http://en.wikipedia.org/wiki/Felix\\_Andries\\_Vening\\_Meinesz](http://en.wikipedia.org/wiki/Felix_Andries_Vening_Meinesz)

During his voyage of three weeks Bert will explain some aspects of gravity in combination with geomatics. Besides input for the TV Series, material will be collected for student projects, activities of the Science Centre and probably also for GOGEO.



On the picture Hans van der Marel & Bert Vermeersen (Faculty of Aerospace Engineering), Michael van de Meer (Science Centre TU Delft), Peter Boon (Fugro-Survey) and Joop Gravesteyn (Tresor TU Delft) during the kick-off meeting on January 26<sup>th</sup>, 2010.

On behalf of the Geomatics Community we like to wish Bert a successful scientific and safe journey. And of course we are more than curious to learn about his experiences. To be continued.

one is able to listen to the sound of highly energetic events such as volcanoes, meteorites and the supersonic flight of aircraft, even if these occur hundreds of kilometres away. Recordings of infrasound signals are made using infrasound arrays, which can determine the incoming direction of the signals. In this research a method is developed to use the recordings of multiple infrasound arrays to estimate the location, in latitude and longitude, of infrasound sources. The method is applied to recordings of three infrasound arrays in The Netherlands which are operated by the Koninklijk Nederlands Meteorologisch Instituut (KNMI) and three additional arrays located in Germany and France.

Almost all detected events occurred during weekdays (99%) and between 7 am and 10 pm local time (98%), which strongly suggests that signals from manmade sources are dominant over the used frequency band (1-10Hz). Locations of the events were found dominantly on the western part of the North Sea. A comparison with the locations of gas flaring showed a large difference in location. It is therefore expected that most detections originate from a different source. The events could be related to military jet exercise (sonic booms) or the detonation of explosives (e.g. clearing of naval mines), but this could not be verified due to the lack of ground truth data. Sources that were found over land showed a strong correlation with military presence (e.g. practice grounds and military airfields). The estimated source locations are validated in twofold. First, by a comparison against locations made by independent infrasound arrays and processing as performed at the Commissariat à l'Énergie Atomique (CEA). Second, the number of located events is compared against the number of events that will be generated for random data.

The applications of infrasound research lie in the field of information to the public, atmospheric research and military intelligence. The KNMI serves as the centre for public information on seismic events in The Netherlands. As the experience of infrasound (e.g. shaking windows) can resemble the effect of an earthquake, information on seismic events and infrasound are intertwined. As meteorological institute, the KNMI is also interested in the use of infrasound to study the state of the atmosphere. The infrasound source location and the state of the atmosphere determine where and when infrasound signals are recorded. Roughly said, once the source location is known, one can start studying the influence of the atmosphere between the source and receiver. The current major drive for infrasound research is the Comprehensive Nuclear-Test-Ban Treaty (CTBT) which aims at detecting and locating nuclear tests from infrasound signals.

### Geomatics Open Guest Lecture by Han Wammes

**ORACLE**

Within the framework of the course GM1080 GeoDBMS Han Wammes from Oracle will give an open guest lecture titled 'Oracle spatial, the foundation of the Geoweb' on March 15<sup>th</sup>, 2010 from 13.45 to 15.30 hours at Civil Engineering & Geosciences (Room CT 4.02).

## Excursion to Heijmans

The Geomatics Group organized an excursion to Heijmans' engineer firm Breijn B.V. Heijmans is a listed Property Development, Building, Infrastructure en Technical Services company. It is a leading company in this sector, combining technical and conceptual skills. The students went to visit the construction site of Eindhoven ring-road renovation project. The road is to be replaced over a 17-kilometre route between the Batadorp and Leenderheide junctions, which is important in order to facilitate the best possible circulation of traffic.

The excursion started by the introduction of infrastructure construction work given by Heijmans engineers. The students got to know how each department cooperate on a large construction work, and the new trend in processing the Geo-information. The development of new measuring technologies like laser scanning, aero-photogrammetry etc. made the engineers eager with Geomatics knowledge to automate and optimize the processing of the data in a larger scale. And the students got the impression Geomatics knowledge relates closely to the practical work.



Heijmans offers chances for students doing a graduation project there for their research problems. This year Geomatics student Stijn Verlaar works on 'Improving the accuracy and automatize the reference point measurements of Pavescan' for his thesis. Heijmans also wants to have a closer relationship with TU Delft. They can offer small research topics as well for students who are interested in it for a guided study.

In case you are interested in any practical case or graduation thesis with Heijmans please contact dr. Ben Gorte ([b.g.h.gorte@tudelft.nl](mailto:b.g.h.gorte@tudelft.nl)).

## Visit of Wageningen University's Master students in Geo-information Science

On the 15th of December, some of our student colleagues from Wageningen University's Master in Geo-information Science visited Delft to meet us, to get to know what each of us is doing, and of course, to have a nice time at 'lichtjesavond' that day.

The MSc programme in Wageningen University is quite similar to ours. However, while we focus more on acquisition and processing of data, they apply their knowledge on solving environmental issues.

Han Wammes from Oracle will give a guest lecture on Oracle Spatial. Oracle's flagship product is the DataBase Management System (DBMS) called Oracle. However, Oracle offers a range of integrated ICT solutions from the development environment and middleware to the application server, and from ERP and CRM software to hardware (with the acquisition of Sun).

Spatial databases are managing more and more data and society is depending more and more on these services. The Geo-DBMS plays a central role in the evolving (geo) information infrastructure, also known as the Geoweb. The Oracle database is traditionally used by the majority of the government organizations (in The Netherlands and worldwide). Originally, this use was mainly for non-spatial applications, but more and more Oracle is also being used for spatial applications (or integrated spatial and non-spatial applications). Oracle is leading the development of support for geographic information and has today more support than any other commercial or open source data management software for geographic information: a range of 2D and 3D vector data types (like point, line and polygon primitives, collections of primitives including arcs and volumes), spatial operators (like buffer, intersect, union and nearest-neighbor), 2D topology within the database, network data model, point clouds (e.g. from laser scanning or multi-beam echos), TIN (for terrain elevation models), linear referencing, version management, spatial indexing, various spatial reference systems and conversions (WGS-84 and RD2000), geo rasters (including compression, selection of parts), XML/GML encoding, and so on.

Han Wammes will not only give an overview of the Oracle spatial capabilities from the outside, but also a look under the 'hood': how did Oracle realize this functionality. Further, a number of key application domains (like Field Service, Asset Management and Business Intelligence) will be highlighted, showing the great importance for society. These examples not only illustrate Oracle's spatial database capabilities, but the whole chain of services (incl. application server with map-capabilities) available via web services protocols, such as SOAP, WSDL, etc. in combination with GIS services like WMS, WFS, CSW and OpenLS. Oracle (Spatial) and TU Delft's section GIS technology have a long standing cooperation and various research results (topology, 3D geometric primitives) are today incorporated in the standard release or in other cases further joint R&D is anticipated. In this lecture the theory and practice of spatial data management will meet and the audience will get an insight in one of the foundation pillars of Geomatics: the Geo-DBMS.

This is the second one in the Geomatics Open Guest Lecture Series. The first open guest lecture was on 'Introduction into the Bing Maps Platform and its Extensibility' given by Johannes Kebeck from MicroSoft Bing Maps.

If you like to attend this open guest lecture you are kindly requested to register before March 8<sup>th</sup> f.c. via e-mail ([b.hooiveldl@tudelft.nl](mailto:b.hooiveldl@tudelft.nl)) mentioning Geomatics Open Guest Lecture Series as subject in your message. Next guest lectures will be given by Ed Parson



For this day, Brenda Hooiveld and the Geomatics Group prepared a day programme that included presentations by people from Delft and Wageningen on our respective programmes and recent projects. We learned about geoinformation used in landscaping and historic tours, while Wageningen students heard about the work performed during this year's Synthesis project.



Afterwards, students from both universities teamed up together to create the best 3D model of themselves using laser scanning. It was very fun and we had a chance to talk to other students doing similar work.



We ended with a tour of TU Delft and a nice dinner in the city centre. Hopefully it will be the beginning of much more cooperation between our programmes!

(Google), David Wortley (The Serious Game Institute) on May 4<sup>th</sup> 2010, Ad van Houtum (KLIC-online), Karel Meinen (TerraCarta) & Stéphane Côté van Bentley Systems (Québec, Canada). For information about date and place you can contact Brenda Hooiveld via [b.hooiveld@tudelft.nl](mailto:b.hooiveld@tudelft.nl).

### Tjeu Lemmens in Casa Luna

On Saturday night February 14<sup>th</sup> from 1 till 2 o'clock Tjeu Lemmens of the section G1St will be the 'Mystery Guest' during the radio programme Casa Luna (Dutch Radio 1). The reason is the recent publication of his book 'Op de fiets naar Cappadocië'.  
<http://www.volkskrantreizen.nl/reiziger/tjeu-lemmens>

### Not only studying, but also time for relaxation

On December 17<sup>th</sup> 2009 Simeon Nedkov organized the third Geomatics get-together. This time the group went ice skating on the ice rink at the Beestenmarkt in Delft.



Also Daniel (Xifeng) and Oliver (Ye) had great fun!

### Agenda

- Graduation Colloquium  
February 12<sup>th</sup> 2010 starting at 15.30 hours  
Faculty of Aerospace Engineering/Room 1 Room 7
- MSc Diploma Ceremony  
February 19<sup>th</sup>, 2010 starting at 16.00 hours  
Faculty of Civil Engineering & Geosciences/Room F
- Graduation Presentation Sven Briels  
February 24<sup>th</sup>, 2010 starting at 08.45 hours  
Faculty of Civil Engineering & Geosciences/Room F
- Open Guest Lecture by Han Wammes (Oracle)  
March 15<sup>th</sup>, 2010 starting at 13.45 hours  
Faculty of Civil Engineering and Geosciences/  
Room CT 4.02

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Elfriede M. Fendel/E-mail: [geomatics@tudelft.nl](mailto:geomatics@tudelft.nl)

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