

Woodgate Wisdom

Nations all over the world are recognising that they can capture the best offerings of innovation when they cultivate strong partnerships between the research sector and the private sector, supported by good Government policy. Recently the Honourable Louise Upton, New Zealand Minister for Land Information, launched the University of Canterbury's Geospatial Research Institute Toi Hangarau. Innovation across the geospatial spectrum will be a key task of the GRI. Post-graduates will play a vital role in its activities and will benefit greatly from the linkages the Institute will form across New Zealand and overseas. The CRCSI is collaborating closely with the GRI and sees it as yet another great development that will strengthen our trans-Tasman relationship. Congratulations to Professor Wendy Lawson whose vision and hard work were directly responsible for the creation of the GRI, ably supported by Professor Simon Kingham.

The Collier Corner

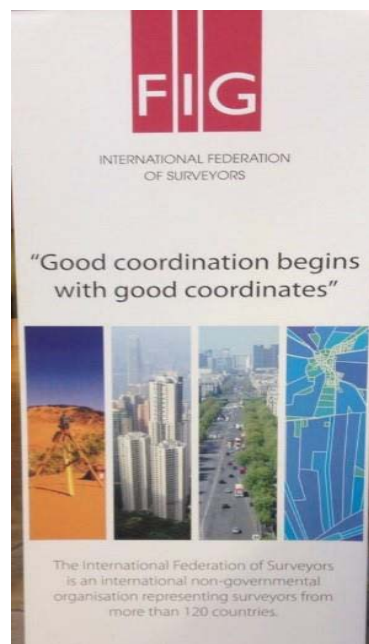
Since joining the CRCSI, a number of NZ-based organisations have become involved in a range of collaborative research projects, particularly in the Spatial Infrastructures, Agriculture, Natural Resources and Climate Change, Health and Built Environment Programs. Along with Land Information New Zealand (LINZ) and the University of Canterbury (UC), the CRCSI is currently recruiting to fill a new Chair in Spatial Information at UC. The aim of the appointment is to grow spatial research capability and to support partners to deliver more impact and benefit from spatial research in New Zealand. The appointee will work in the newly established Geospatial Research Institute at UC and will engage with partner organisations to align research activity with the needs of end users and with the recently released New Zealand Geospatial Strategy and the New Zealand Geospatial Research and Development Priorities and Opportunities document. From the CRCSI perspective, this new position will add strength to the Spatial Infrastructures program in particular and will assist LINZ in realising a new National Spatial Data Infrastructure and will also support the establishment of the Canterbury Spatial Data Infrastructure, being implemented as part of the Christchurch recovery program. These developments herald significant growth in our relationship with NZ and bode well for future trans-Tasman spatial research excellence.



Student Experience at the NZ FIG Conference

Luis Elneser, P1.01

The city of Christchurch, New Zealand hosted the FIG Working Week 2016 between 2nd and 6th of May, bringing together surveying and spatial professionals from 77 participating countries under the theme "Recovery from Disaster". This topic is particularly meaningful for Christchurch after a series of three major earthquakes devastated buildings and infrastructure from September 2010 to June 2011. Despite the immense damage, the city has recovered and is experiencing a boom of construction projects which are rebuilding and revitalising the central business district and surrounding areas of the city.



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The role of surveying and spatial professionals in this rebuilding effort was demonstrated in a series of technical and plenary sessions, workshops, meetings and tours throughout the conference. Presentations during the technical sessions were organised in the FIG's ten Commissions which included some popular discussions around the Contribution of Geodesy to Disaster Management, the Application of BIM in the Construction Industry, Disaster Recovery Innovations, GIS, Mapping and Photogrammetry to name a few. Great keynote talks during the plenary sessions gave the perspectives from the city of Christchurch, the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) and the Student Volunteer Army for Disaster Management.

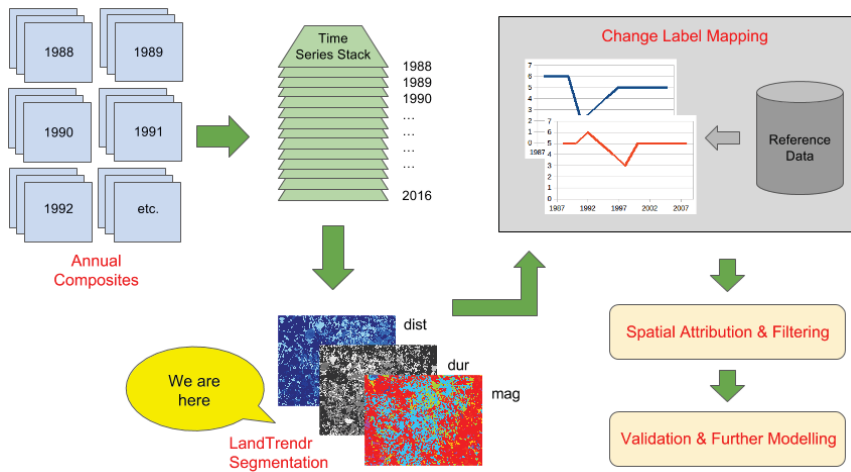
This was my first experience with the FIG and it was a great one, the amount of participants that travelled from all over the world was quite impressive and comparing notes with surveying and geospatial professionals from different continents on a range of topics covered by the FIG was refreshing. Talking about refreshing, the FIG Young Surveyors Network held a conference prior to the main event and, while I didn't attend, all accounts mentioned it was a success so I look forward to being a part of the next one as I'm still young(ish). The upcoming FIG Working Weeks will be held in Helsinki 2017, Istanbul 2018, Hanoi 2019 & Amsterdam 2020.

My Research News, Issues & Outcomes

Landsat Time-Series Modelling

Sam Hislop, P4.104

Using Landsat satellite imagery from 1988 until the present, I am currently running a time-series model (LandTrendr, developed by Kennedy et al. at Oregon State University) over the public forest estate west of Melbourne to characterise land cover changes that have occurred over time. The model uses annualised composite images taken during summer to create an image stack of over 25 years. The stack is then analysed on a pixel by pixel basis to create segmentation layers, including number of disturbances, years of onset, duration and magnitude. The next step in the process is to label the segmentation outputs using a multiple lines of evidence approach (reference data that includes ancillary datasets and Google Earth imagery).



Landsat Time-Series Modelling Workflow

Health

John Lewis, P4.103

More integrated and accessible information systems including Smartphone apps, cancer information websites, decision support systems, geographic information systems, electronic health records and social media) support can enable primary care services to more effectively manage cancer survivor care needs.

My PhD research focuses on the information needs of primary health services caring for colorectal cancer survivors in Australia with a particular emphasis on Sydney South West Local Health District and its socioeconomic and geographical factors.

I am about to start preliminary consultations with specialist oncologists, general practitioners, nurses and allied health professionals who work with colorectal cancer survivors in Sydney South West. The information gathered will help me refine the scope of the research and maximize benefits to colorectal cancer survivors.

The research aims to develop a framework for information systems that can improve the coordination of care for colorectal cancer survivors. This means colorectal cancer survivors will not have to repeat their stories to different providers will not have to carry around paper referrals, reports or prescriptions and will be more informed about their own care. Providers and policymakers will be able to use advanced data analytics that are teamed with geographic information systems to more effectively target their efforts.

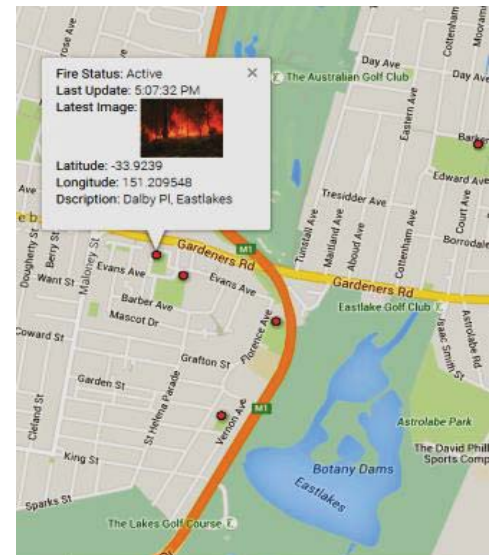
We asked three students from across the research program for their latest updates.

Spatial Infrastructures

Teuku A. Geumpana

Recently, I have been experimenting with the usage of google fusion tables in displaying specific points on a map based on user reported location. In the context of my research of bush fire scenario, I am using Fusion Tables to store all information on fire points reported in the nearby area.

To do this, I created server-client interaction to enable users to send data captured on fire locations and store it in the online database. Next, the dataset with predefined format is generated to be transformed into the Fusion Table. Fusion Tables auto-detect location data and visualize the data on a map. When the map appears, it displays round red-dot placemarkers scattered across the area that have been reported. The placemarkers are clickable to view the information for that row in the default window template.



Fusion Table Fire Data

Duane Wilkins, LINZ

Getting hands dirty with address data

Normally, I work as the GIS team lead for the Department of Conservation, but for the past couple of months, I've been working on a secondment with Land Information New Zealand, who are the folks that make, for example, Topographic maps and marine charts in New Zealand. It's been fascinating experiencing a new and different workplace, meeting lots of new people and working on some interesting and varied tasks.

Over the past couple of months, I have been meeting with data analysts, researchers, and geospatial information providers and users from most government agencies, to understand common issues in locating people and the types of data and the methods used to provide fun services like collecting your tax, paying your fines and reminding you to renew your driver licence. This work has really opened my eyes to how incredibly important it is to manage address data well to enable agencies to send the right information to the right place and avoid sending confidential information to people and places where it shouldn't be sent.

One of the most interesting things I've been able to do is to sit in with the emergency services operators from the 111 service, observing how they locate people and use all manner of sources and techniques to determine a location, assess the situation, and then dispatch police, fire, or ambulance staff if required. I have been working in fields related to geography for a long, long time but I was not prepared for the urgency of locating the caller. This is extreme geography at its best.

If you're not already on LinkedIn I would encourage you to set up an account and connect with me on there. I am keen to network and help our geospatially inclined students develop their capability. Being able to reach out to people who have particular experience or who can provide guidance is extremely valuable and not necessarily something you can do with Twitter Facebook or Instagram. If you look me up you'll find some of the presentations and videos I've made over the years in places like Iraq, Afghanistan, Whanganui and even the Googleplex in Silicon Valley.

For the past few weeks I've been posting a blog on LinkedIn that describes some of the interesting or unusual things that I've come across while doing this piece of research. For example, did you know that Spark, Vodafone, 2Degrees, and the 111 Centre do not know the location of your smartphone? Google, Facebook and other apps do though. There is no easy fix!

Over the coming months I'm hoping to continue posting interesting observations about the things I've learnt and experienced as a way to share what the team is working on and to get feedback on the support that is needed from the geospatial community and how our team can help grow geospatial use and the benefits of the "power of where"!



Duane on his bike at the Googleplex, Mountain View California.



Nic presenting at the FIG conference.

Dazzling the punters at FIG

Nic Donnelly, P1.02

The International Federation of Surveyors (FIG) conference held in Christchurch in early May provided a unique opportunity for delegates to experience first-hand a city recovering from a natural disaster. Numerous presentations, technical tours, workshops and discussions were built around the theme of recovery from disaster. These highlighted the critical role of spatial data in understanding the nexus between people and place that drives a successful recovery.

As a student in the Positioning Programme, I was particularly interested in how positioning infrastructures are impacted by natural disasters and the role they play in the subsequent recovery. The strength of the FIG conference is that it attracted delegates from about 70 countries, so there were a range of perspectives provided. Many of the presenters talked about the need to have positioning infrastructure and strategies in place before a disaster occurs, as they are needed in the immediate aftermath of a natural disaster.

Developing nations have particular challenges, but are looking at innovative ways of increasing their resilience. One of the most interesting discussions I observed over the week

involved a dozen Pacific Island nations who are working on a joint strategy to enhance their geospatial infrastructure, capability and capacity.

From a research perspective, I was very interested to hear about the datum modernisation initiatives of a diverse range of countries grappling with deformation issues, including Sweden, the United States, Japan, Indonesia and Nepal. These countries have all incorporated deformation models into their datums, or are in the process of doing so. A common theme was the current inability of commercial geospatial software to adequately cater for coordinates that change over time, which is a barrier for users who need to maintain accurate coordinates. This is an area in which the CRCSI is making a contribution, through work being done as part of the Next Generation Datum project.

One of the biggest benefits of attending a conference such as FIG is the ability to network with key leaders across the spatial industry at an international level. Social events each evening provided ample opportunity for this to happen, as well as contributing to a very enjoyable conference!

From the Education Manager

Nathan Quadros

It's been great to welcome four new students into the CRCSI cohort. Please have a look at their research in this issue of the newsletter. All four are back by great industry experience which I'm sure will add a lot to this year's student day in Sydney.

This year we've started the CRCSI Student Leadership Initiative with nominated students from West Australia, East Coast Australia and New Zealand participating in regular catch-ups with the CRCSI. The representatives for 2016 are Azeem (WA), Nuddin and Luis (ECA), and Hamish (NZ). I've been really pleased with the engagement, strengthening the connection of the CRCSI into each university.

The student leaders are also charged with a "get together"; with funding put aside for the leaders to host a function with the CRCSI students in their region. At the moment the student leaders and the CRCSI are exploring ideas for the student day at the conference on the 25th October.

The prevailing idea is to hold a "solvathon", where we'll get a CRCSI partner to present a problem to the student group. We'll place an expression of interest to our 43pl and government partners in July, and then select the best response for the student day. We're now working with the student leaders to design a day which is both challenging, collaborative and engaging. Feel free to discuss any ideas with your representative, and I look forward to seeing you all later on this year.

Enjoy this NZ edition of the newsletter.

Education Manager:

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Let's Meet Arjan Arjan Wilkie, P4.103

What are your hobbies?

I like to do things with my hands like build fences, sheds and furniture. I am renovating our house one room at a time and that is satisfying. I like learning new skills and with an old house the learning curve is always pretty steep. Cooking and bushwalking are also fun.

What is the last movie you watched?

X-Men Apocalypse. Great movie! We took our two daughters who are also into X-Men. Before that the last really good one was The Dressmaker, an instant classic.

What is a place you'd like to visit?

There is a long list on the fridge! But my top three are Patagonia to see glaciers calving, Angkor Wat in Cambodia, and Japan at any time but if we could see the cherry blossoms that would be great.

What is your latest travel story?

I was doing some soil sampling field work in the Macquarie Marshes in western NSW when a wild pig erupted from the undergrowth at full tilt, about 1m from where I was kneeling, with a litter of sucklings running behind, they ran straight past me but suffice to say I was pretty startled. On the same trip on the last day, after sampling the last location on a long list, just as the sun was setting, I was carrying the DGPS, wooden mallets and soil corers back over the fallen tree/log-crossing at the creek when I slipped and fell backwards into the creek! Totally drenched from head to foot but I managed to keep the DGPS out of the water! The guy I was working with had the samples, and a good laugh.

Carbon Accounting Arjan Wilke, P4.103

Part of my PhD project involves using tree height data to estimate biomass, and I use Lidar where I can get it, but coverage is relatively sparse, particularly over native forest systems.

However, NSW LPI recently approved the release of a digital aerial photogrammetry-derived pointcloud test dataset which will allow me to generate a DSM of the vegetation height. Being derived from a passive dataset, the DAP pointcloud is not as data-rich regarding forest structures as lidar, but it promises to have statewide coverage within a few years which means if I can use it then our results can potentially apply to the whole state with a canopy height accuracy comparable to lidar, and with the same 50cm spatial resolution as the ADS(40/80) source imagery.

Another part of my PhD concerns mapping soil units to aid with carbon estimation, and I have just received a new Worldview-3 SWIR dataset over one of my study areas from Geolmage. This is the latest sensor for high resolution SWIR data and will be the best source of information until new hyperspectral satellites are launched in a couple of years (i.e. EnMap), so it will be great to see if I can demonstrate an improvement over using existing SWIR and geophysical data.



Arjan's mug shot