

The New Zealand Statistical Association **Newsletter**

Number 77

June 2016

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Welcome

Nothing lasts forever, as they say. This is not intended to be a commentary on the likelihood of the All Blacks losing a test match sometime soon, but rather a reflection that this newsletter contains more than the usual number of notices of retirements, and an obituary. The latter relates to the death of NZSA Life Member **Geoff Jowett**, about which you can read more on page 10.

Steve Haslett has also passed over, but in his case I thankfully refer only to the Tasman! Having retired from Massey University late last year, Steve is now in Canberra running the Statistical Consulting Unit at the Australian National University. Steve has been a superb servant of the New Zealand statistical community in general, and NZSA in particular, over many years. This led to his well deserved receipt of the Campbell Award in 2010, the citation for which is linked to in the article on Steve later in this newsletter. In a double whammy, Massey has also recently seen the retirement of Chin-Diew Lai. His protege Mark Bebbington provides a nice tribute on page 11. Fortunately Chin-Diew has not left the country (indeed, he has not quite left the building as I write this!), so students and colleagues can continue to tap his statistical wisdom for a little longer.

by MARTIN HAZELTON NZSA President

At the other end of the spectrum, the newsletter also covers the achievements of those just at the beginning of their careers in statistics in New Zealand. Reading through the Local News items you will find announcements of a variety of new appointments, while the 2015 NZSA/ORZNZ conference report includes the bright young things who won the various student talk awards.

Of course, regardless of how bright (or young) you may be, starting a first job in statistics can be a nerve racking experience. This is particularly the case for those working in a small group of statisticians, or even as a solitary statistician, within a large organization. In some cases it can be difficult to know where to turn for help, be it in regard to a technical problem or concerning more general career advice. This is potentially something with which NZSA can help. The Executive currently has a small working party looking at the development of mentoring schemes for early career members. We are also looking to provide more professional development opportunities through a programme of short courses. You can expect some announcements on both of these initiatives over the next few months.



Editorial

I have enjoyed pulling this newsletter together. As Martin has already mentioned, it includes a lot about the comings and goings of many in our New Zealand statistics community. If news of your particular part of the community is not included it either means there is currently no volunteer contributing anything or your current contributor was too busy (or ...) to meet the deadline. In either case if this is something you would like to take up please do email me and volunteer. (m.fitch@auckland.ac.nz).

You will also notice that I have included a report on the recent STEMS2016 colloquium in Sydney. I was fortunate enough to be able to attend this and was therefore in a position to twist the arms of three other (of the 7 total) NZ attendees to write something. I would welcome similar contributions, or other items of interest for future newsletters. The next newsletter is planned for the end of the year, so in particular I will be looking for reports on the NZSA2016 conference.

If there are other items you would like to see included in this newsletter please let me know. Meanwhile I hope you enjoy reading about some of what the NZ statistics community has been doing recently.



Conferences

A (short) short recap from NZSA Conference 2015

The 2015 joint NSZA + ORNZ Conference was held at the Dovedale campus of the University of Canterbury at the end of November 2015. Plenary speakers were Richard Boys (Newcastle University) *Bayesian inference for stochastic kinetic models using data on proportions* and *On the ranking of Test match batsmen*, Geoff Pritchard (University of Auckland) *Stochastic processes for hydrological optimization problems* and Thomas Lumley (University of Auckland) *Data Science: Will Computing and Informatics Eat Our Lunch?*

A report on (and photographs of) the winners of the three NZSA awards can be found later in the Newsletter, here. The winners of the student talk prizes are pictured below.



Student talk prize winners: Roy Costilla, Sarah Pirikahu, Shirley Wu (Harmonic Analytics), Anjali Gupta and Maarten Kruijver with Martin Hazelton (NZSA President)

See more photos from the 2015 conference: https://www.flickr.com/photos/111101747@N06/sets/72157659546529703 It is evident that today's society has a growing dependence on the use of data to make informed decisions in all aspects of daily life. In response to this, the STEMS2016 colloquium and workshop (https://stems2016.com/) was organised by the Statistical Society of Australia (SSA) with the aim of initiating a transformation in the provision of Statistics education in Australia, from Kindergarten to Post-Doctoral levels.

A variety of speakers on the first day discussed the need for increased statistical capability building, and the new forms that that capability needs to take. Many technical jobs in industry and in particular in commerce will be replaced with jobs requiring a greater level of skill with data and statistics. There were interesting observations made on how it can be difficult in Australia (and by extension NZ) to stimulate effective statistical collaborations and new developments. This is partly because funding agencies (like the ARC and Marsden fund) favour individual researchers, and there is consequently minimal salary buyout in larger collaborative projects involving applied statistics. Statistics also suffers from its separation from Mathematics and Computer Science (despite often being in a department with Mathematics).

On the second day a discussion group on postgraduate qualifications led to a set of constructive proposals. Firstly the development of some guidelines for construction of postgraduate programmes in statistics - which should recognise three principal student types - Decision makers (sophisticated users and interpreters of statistics), Analysts (technical experts) and Innovators (developing new methodologies and theories and working on the foundations of statistics). These groups have some common needs (communication skills, research methods), but some highly specific needs (computer coding, advanced mathematics) and can all benefit from exposure to real world problems. There are opportunities for development of shared (between University) offerings of advanced level courses, as well as student research supervision. The Biostatistics Collaboration of Australia is a particularly good example of such a collaboration.

Another group on the second day concentrated on undergraduate teaching. Discussion revolved around curriculum change, collaboration, first course teaching, data driven teaching, and training for the workplace. Ideas included relaxing mathematics prerequisites and reducing statistical theory in favour of data driven problem solving with modelling and use of statistical software. Computer science courses are alternatives to mathematics for some students but mathematics is important for the statistics specialist.

Flexible Graduate Diplomas in Statistics using a selection of undergraduate courses should be encouraged if university regulations allow. Such a programme provides statistics training for graduates in other disciplines. With good grades it may be possible to continue to a Masters in Statistics.

Context and real data lead to research questions. Typically there should be missing values and other data problems necessitating data cleaning which should help provide training for the workplace. Access to appropriate data is important. An example is the Australian data archives at ANU. There are other sources but students seem to like genuine data from contexts relevant to their own countries and experiences.

There are several structures for first year service teaching. At Auckland University there is a course with 5000 students. At other universities there are courses focusing on particular disciplines, for example the Biological Sciences, Psychology, the Health Sciences and Business. This second approach allows change in emphasis to accommodate requirements of consumer disciplines along with examples reflecting relevant contexts. Consulting on curriculum content with colleagues in consumer disciplines was viewed as essential as it is they who set their statistical prerequisites. It is important to be aware of both the new statistics curriculum in schools and the fact that many students still begin their statistics with the first year service course only.

Several challenges were identified for and recommendations made to the Statistical Society of Australia. These included:

- Aim for greater visibility for statistics education activities along the lines of the American Statistics Association Education Sub Committee which has extensive resource links.
- Develop a course repository where universities share information on courses rather than compete.
- Build a YouTube/video repository.
- Establish a committee of first year course coordinators and teachers where teaching successes and good practice can be shared.
- Investigate the establishment of Awards for successful teaching in the discipline of Statistics. These would be in addition to University teaching awards.
- Investigate the provision of apprenticeships for teachers teaching out of field as a way of increasing the number of statistics teachers.

The third group on the second day investigated the teaching of statistics in schools. For the schooling group the focus was on a number of areas including assessment, the practicalities within the schooling sector and teach as practice. The main discussion was around the idea of teach as practice. This means ensuring that the teaching of statistics in school reflects the practice of statisticians. Suggested actions included developing ideas around using the statistical enquiry cycle as an underpinning process for teaching and learning rather than teaching isolated skills and making connections with industry. A working group was established to take the work forward.

It is interesting to note that in Australia statistics is only assessed as part of a mathematics course at year 11 or year 12, it is not a subject in its own right as it is in New Zealand. In New Zealand statistics has been recognised as a separate body of knowledge for many years through firstly the Applied Mathematics course, then Mathematics with Statistics and now through the statistics achievement standards at year 13.

2016 Joint NZSA+ORSNZ Conference 27-30 November

The New Zealand Statistical Association and the Operations Research Society of New Zealand are holding a joint conference hosted by Auckland University of Technology at their city campus from Sunday 27 November to Wednesday 30 November 2016.

Key dates for registrations and submission of abstracts have been announced on the conference web site, http://orsnz.org.nz/conf50/key-dates/.



Australian Statistical Conference 2016

The Australian Statistical Conference 2016 in conjunction with the Australasian Data Mining Conference (AusDM) and the 19th Australian Conference on Teaching Statistics (OZCOTS) will be held Monday 5th to Friday 9th December 2016 Hotel Realm, Canberra. See the conference website, http://asc2016.com.au/ for further details.



Note also the **2016 Australasian Applied Statistics Conference** (Monday 28 November to Friday 2 December).

See http://aasc.org.au/ for further details.

Stories of interest

NZSA Awards 2015

Worsley Early Career Award

This award recognizes outstanding recent published research from a New Zealand statistician in the early stages of their career.

Dr Blair Robertson

University of Canterbury

Dr Robertson completed his PhD in mathematics at the University of Canterbury in 2011 under the supervision of Associate Professor Chris Price and Associate Professor Marco Reale. His PhD research considered minimizing non-smooth optimization problems using global optimization techniques. During his PhD, Blair developed and programmed several stochastic algorithms to solve a variety of non-smooth optimization problems using direct search methods, random sampling, and statistical classification techniques. During his time as a PhD student he produced six publications on numerical optimization, and four more have followed. Blair has applied his background in numerical optimization to various aspects of statistics. He has led the development of a new area in sampling theory, having introduced the use of quasi-random number sequences in statistical sampling. This novel development has led to changes in designs in environmental monitoring both within New Zealand, and overseas in USA and France. He is the lead author of a journal article on this topic in Biometrics. He is involved in supervising two PhD students in this topic.

Blair has also expanded his work into the field of data mining, and has been involved in supervising one PhD student and has one journal article to appear soon.

Blair is also a principal investigator on two funded research projects: a \$1m grant from the Qatar National Research Fund; and a second partially funded from the University of Wyoming for \$6.7m, on power generation and power economics.



Blair with James Curran (Awards committee convenor)

Littlejohn Research Award

This award recognizes excellence in research, based on publications during the five calendar years preceding the date of the award.

Dr Mark Holmes

University of Auckland

In the last 5 calendar years Dr Holmes has produced an outstanding range of publications, with publications in 14 different journals in various areas of theoretical and applied probability, combinatorics and statistics. These 14 journals include 5 A*-ranked and 8 A-ranked journals (ARC2010 journal ranking). Mark has demonstrated extraordinary creativity in the field of probability theory, including the invention of degenerate random environments, and introducing arrow systems as a natural way of coupling self-interacting random walks in one dimension. He has made major contributions to the theory of interacting stochastic systems.

NZSA Campbell Award

The purpose of the award is to promote statistics within NZ and to recognise an individual's sustained contribution to the promotion and development of statistics.

Associate Professor Maxine Pfannkuch University of Auckland

It would be hard to find anyone anywhere in the world who has contributed so much to statistics education on such a wide variety of fronts as Maxine Pfannkuch - as an internationally recognized leading researcher, as a path-breaking curriculumdevelopment leader, and as an educator and mentor to a generation of statistics education leaders in New Zealand, particularly in the secondary school system and the teacher-development sector. Her work has already had an enormous impact throughout New Zealand but is now gaining traction much more widely as other reformers point to the New Zealand example to bolster their cases. She meets every one of the Campbell Award criteria: publication of an exceptional body of original statistics research undertaken within NZ in her subfield of statistics education; a prolonged and outstanding contribution to statistical education as a curriculum and teaching leader over many, many years; leading major and innovative research projects that have direct relevance to NZ; and making a leading contribution to the promotion of statistics within NZ by making real and relevant statistics more accessible to a wider spectrum of students throughout this country.





Thanks: Alan Welsh

We would like to express our sincere thanks to outgoing ANZJS Editor-in-Chief, **Professor Alan Welsh** from ANU, who has finished his three year term.

The consistently high quality of material in the journal is due in no small part to Alan's tireless dedication and attention to detail. Alan's diverse range of statistical interests and his capacity for genuine enquiry were key strengths from which the journal benefited greatly.

As a past Applications Editor for the journal and as no stranger to theoretical developments, Alan brought both breadth and depth to his editorial work, along with outstanding wisdom and judgement.

We are grateful for all of Alan's efforts and his participation will be missed.

Obituary: Geoff Jowett

Geoff Jowett (Geoffrey Harcourt Jowett) died peacefully in the presence of members of his family on 18 December, 2015. He was aged 93.

Geoff was a Life Member of the Association. He arrived in New Zealand in 1964 to take up the chair in statistics at the University of Otago, and after several years moved to the Invermay Agricultural Research Centre to work as head of the biometrics section there. Many Association members will remember him as an inspiring and entertaining lecturer and speaker, a colleague or mentor and a friend. He will also be remembered for his work in introducing, in conjunction with another (late) Life Member, H S (Stan) Roberts, statistical education into New Zealand schools.

The NZ Statistician article on Geoff on the occasion being made a Life Member of the NZSA in 1984 is at http://www.stats.org.nz/site/uploads/Geoff-Jowett-NZ-Statistician-1984_Vol1_No2_November.pdf. It includes the following photograph of Geoff.



Chin-Diew Lai, Massey (Statistics) 1979-2015

Sometimes we need to go to a colleague's farewell function to find out more about them, and I am extremely pleased to have been to Chin-Diew's afternoon tea where Mark Bebbington gave the following address: [square brackets are Jonathan's notes]

After undergraduate and master's degrees from Auckland, Chin-Diew received a PhD from VUW, supervised by David Vere-Jones. Chin-Diew and I share many things, among them a supervisor, so it's amusing but not surprising that our first papers were both on earthquakes: Chin-Diew's was: A two-dimensional immigration-branching model with application to earthquake occurrence times and energies, in the Journal of Applied Probability, in 1977. Chin-Diew started at Massey in 1979, was made Professor in 2008, and has been a pillar of the stats group for 37 years. To put that into context, once Doug Stirling retires (for the first time) [not quite *yet*], the longest serving member will have been in place for a mere 22 years [I suspect some sign language was used at this point, a finger pointed by the speaker towards himself].

Chin-Diew and I taught several courses together, back when stochastic operations research was the third stream in the statistics offerings. Chin-Diew's teaching back-catalogue features all the (mostly now defunct) 40's: 240, 340, 341, 342, 345, 740, 743. One of our study guides slowly grew to 428 pages, an all-inclusive, step-by-step guide, which we briefly mooted making into a book. However, one year a student thought we weren't covering the right topics. During the fallout that followed it transpired that the student didn't know what the 'e' in the e^x on his calculator was. Nevertheless, the experience was so traumatic that the next year's study guide was three pages long and we specified a textbook.

Chin-Diew has published 137 papers, 9 book chapters and, to top it all off, 5 books. From Google Scholar (all numbers wrong or your money back!), his H-index is 25, with > 3000 citations. A statistician has been defined as "someone who likes to play in other people's sandpits", and there are some interesting journal titles in Chin-Diew's list: J Theory Biol, NZ J Crop and Hort Sci, Kotuitui (NZ J Soc Sci online), Emer Manag Aust, and of course Bull Volc, the 'top journal in my field' according to a small sample of statisticians.

Chin-Diew is acknowledged internationally as an expert on reliability theory, and has published often with the big names: Kotz, Xie, Murthy, Navarro, Pham, ..., Bebbington ... Chin-Diew has been a keynote/invited speaker at conferences in the USA, Spain, Russia, Malaysia, Hong Kong, Japan, U.K. and (both) Chinas. I'm not sure whether it paid off for the PBRF, but the air points haul must have been impressive.

According to Scopus (a slightly more acceptable bibliometric source) there are 9 past or present members of the statistics group among Chin-Diew's co-authors. When I arrived here many years ago, fresh from a post-doc, I was of course completely thrown by this 'independent research' thing. This was also when new appointments had a formal confirmation process, which suggested that it might be a good idea to develop some research direction(s). To my rescue came Chin-Diew, armed with a paper (from Mathematical Geology) and (as far as I can remember) "You're interested in this sort of thing Mark, I don't think much of what he does in this paper". I should add that I've since had a lot more experience with that particular author, and the paper in Chin-Diew's possession was one of his better efforts. Nevertheless, Chin-Diew showed me how you could write a good paper, without mortally offending the person whose work you were savaging, a vital skill for the aspiring academic. A couple of decades on, Chin-Diew and I have co-authored 31 papers, testament to a mutually rewarding collaboration.

One of the most vital, and sometimes overlooked, influences on an academic career is the mentoring that a young academic gets once they're in their first 'real job'. That I define as one where no one else is responsible for their output. I was incredibly fortunate that Chin-Diew was here, and in being the recipient of his generosity, energy, and honesty in all his dealings. In fact I even bought a house from him. Chin-Diew also did a year as Head of Stats in 2003, a fact I am slightly less grateful for, as I had to succeed him until the present incumbent arrived to shoulder the burden.

[NZSA members should also remember that the 2010 conference held here at Massey drew some fine international visitors because we held a symposium in Chin-Diew's honour.]



Steve Haslett

Finding the speech notes from the farewell for Steve proved a little more difficult. For those who would like to read more, Steve's citation for the Campbell Award can be read in the NZSA Newsletter 72

[Steve almost certainly has more air points than Chin-Diew and filling the space left in teaching our Stats Consulting course is all the more difficult for me because my experiences are so tame compared to those told by Steve on his return from the latest ventures.]

An update from Steve as to what he is up to now ... which doesn't sound much like retirement!

Sticking to facts, there are really over 100 published papers, plus book chapters, and rather more consulting reports than that!

I decided to retire from Massey after 21 years (plus 17 at VUW), put in formal notification, and was getting prepared to do more fly fishing. (The Manawatu river is at the bottom of our garden.) There had been some rumblings from ANU, but discussions were not progressing. Then, at the point matters were about to fold, the required funding at ANU to run the Statistical Consulting Unit was formally agreed, and I decided to do less trout fishing. The job here is a very interesting one. ANU has four full time, centrally funded consulting statisticians all employed as academics. This is ideal from some points of view. It certainly provides a career structure with the expectation of publication rather than simply a high workload consulting and running courses, with limited career prospects. Nevertheless, demand for the SCU is high and expanding, and there is also a university-wide need for short courses in appropriate use of stats packages. So further appointments are a possibility. If interested, keep a look out for an advertisement, which would of course go on ANZSTAT. I'm here in Canberra until late 2018, unless there is some reason to return to New Zealand earlier. With luck, when I get back to Palmerston North, there will still be some fish!



News from the Stats Education Teams

Statistics Education News, May 2016

by MAXINE PFANNKUCH

International News

International Congress on Mathematical Education 2016, 24-31 July in Hamburg. Topic study groups are being organized in statistics and probability. For further details see http://icme13.org/.

The IASE Roundtable Conference will be held in Berlin July 19-22, 2016 at the Max Planck Institute. The theme of the Roundtable is Promoting the understanding of statistics about society (see http://iase-web.org/conference/roundtable16/)

The **10th International Research Forum on Statistical Reasoning, Thinking and Literacy** will be held on 2 to 8 July 2017 in Rotorua, New Zealand. Maxine Pfannkuch, Stephanie Budgett and Pip Arnold are organizing the conference. The theme of the Forum is Innovations in statistical modeling to connect data, chance and context. (see http://srtl.info)

World Statistics Congress 2017, 16-21 July in Marrakech, Morocco. The International Association for Statistical Education (IASE) has organized about 10 Invited Paper Sessions for this conference (see http://www.isi2017.org/)

Local News

Prof Christine Franklin, University of Georgia, USA, visited Auckland University for two weeks in March on an International Faculty Exchange. The aim of her visit was to follow up on her visit last year and to strengthen her NZ collaborations in the field of statistics education including setting up a mechanism for cooperation between the NZSA Education Committee and the American Statistical Association and National Council of Teachers of Mathematics Joint Committee. She has recently been appointed as an ambassador for the American Statistical Association promoting statistics education across the USA. The potential outcomes from her interest in NZ statistics education promise to be very fruitful. Maxine Pfannkuch will visit Christine in September as part of the Faculty Exchange Scheme. **Dr Jennifer Noll, Portland State University, Oregon, USA** also visited Auckland University for a week in May and gave a seminar on *Students' Statistical Modeling with TinkerPlots*TM

CensusAtSchool Project. The CensusAtSchool site is undergoing a transformation in order to make classroom materials more accessible to teachers. As part of the curating of the resources, iNZight Lite (http://lite.docker.stat.auckland.ac.nz/) is now embedded as an option to inspect and anal-Another new tool available for vse data. CensusAtSchool users is Tabulator for producing tables of counts and plots of the data (http://tabulator.docker.stat.auckland.ac.nz/).

The CensusAtSchool project is sponsored by the Department of Statistics of The University of Auckland, Statistics New Zealand, and the Ministry of Education. It has become the central repository of resources for teaching the NZ school statistics curriculum. Chris Wild and Rachel Cunliffe are co-directors of the project. They are assisted by Anne Patel in the running of the website. See: www.censusatschool.org.nz.

People in statistics education research. Stephanie Budgett, Auckland University and Pip

Arnold, Cognition Education, are presenting papers at the ICME conference in Hamburg in July 2016. Through an invitation, Anna Martin, Auckland University, is presenting at the American Statistical Association's Teachers' Workshops as part of the Joint Statistical Meeting in August 2016 in Chicago. Rachel Passmore, Auckland University, has completed a master's thesis on *The impact of curriculum change on the teaching and learning of time series* and found that there

was evidence of higher levels of reasoning now being required for the NCEA Level 3 standard compared to the previous standard. Stephanie Budgett and Maxine Pfannkuch have completed a twoyear Teaching and Learning Research Initiative exploratory project on *Visualizing chance* for which they developed some promising interactive tools for enhancing introductory probability students' reasoning in the areas of conditional probability, Poisson processes and Markov processes.

NZSA Education Committee, June 2016

by Mike Camden

The last six months have been a time of introspection (and extrospection) for the Education Committee. After lots of work, we now have a four page statement that describes:

• our purpose. Please see this section on our webpage:

http://www.stats.org.nz/committees/education

- processes for polishing statements for release, accepting new members, prioritising issues, and archiving of records
- guidance for members
- the new steering group, which keeps contact with the NZSA executive, decides where to put our efforts, and approves statements for release.

The Education Committee started its life in 1987. We've taken only 29 years to get here!

The underlying purpose of all this introspective thinking was this: to ensure that the limited time that our members can put into our work has the most useful impact possible on statistics education.

If you're wondering what our purpose for existence is, then please note this sentence from the statement:

Our main goal is to positively influence statistics education by providing leadership that consists of expert advice and advocacy for change. We want to respond to current needs, and look into the future for potential opportunities and challenges.

We now have a committee of 25 active members, and a steering group which is a subset of eight of them. Both teams have a wide spread of backgrounds, and geographical locations that go from Dunedin to Auckland.

We're also changing our meeting and document management processes. We have used Zoom! successfully several times, thanks to support from Greg Trounson of Otago. We are planning a folder structure for documents on GoogleDocs that we can all access and work on.

The issues that we want to put energy into this year include:

- Statistics education in the primary sector
- Liaison with the Joint ASA/NCTM committee in the USA (ASA = American Statistical Association, NCTM = National Council of Teachers of Mathematics)
- Time Series, and especially the NCEA Level 3 Achievement Standard
- Probability, and progressions in it across the whole of the New Zealand Curriculum
- Datasets: Sourcing, processing and making fit for assessment data that engages and is useful for students

- Big data: its implications for content and pedagogy of learning in statistics
- The future of statistics in work and life, and the implications for school statistics.

If you want to contribute to or comment on any of them, please contact us.

We are very pleased that Maxine's leadership in world statistical education has been recognised with the NZSA's Campbell Award (see citation). She and her colleagues have combined research into pedagogy, teacher professional development, and software development, in a way that serves New Zealand school statistics education very well, and informs the rest of the world. See also CensusAtSchool article.

Finally: we are interested in the Statistical Society of Australia's initiative in running the colloquium and workshop: STEMS: Putting Statistics into STEM in the Age of Data; https://stems2016.com/program/. (STEM = science, technology, engineering and mathematics, and you can guess what the extra S stands for!). This was in Sydney on June 2 and 3. Several committee members participated, see STEMS2016 report.



Members of NZSA Education committee meeting via *Zoom*, June 2016. They are: John Harraway and Tillman Davies (Dunedin), Jake Wills (Kapiti), Alex Neill and Mike Camden (Wellington), Michelle Dalrymple (Christchurch), Maxine Pfannkuch, Marion Steel, Chris Wild, Marie Fitch and Anna Martin (Auckland), Alasdair Noble (Christchurch), Robyn Headifen (Auckland).

Local News

Statistics at the Department of Conservation

by IAN WESTBROOKE

Main foci over the last year for our team of two ()since Paul van Dam-Bates joined DOC) have been design and reporting for monitoring conservation work. On the design side, the key development involves proposals for a master sample framework to provide a common geographic framework for different environmental/ecological monitoring projects at a variety of geographic levels, from NZwide to very local. We've been receiving advice and assistance from Tony Olsen at US EPA, and Blair Robertson at Canterbury University. On the reporting side, we're concentrating on automated reporting from source data through delivery - with the usual wide variety of topics, from assessment of the seed fall for the risk of a major eruption of rats, mice and stoats in native forests, through to reporting on visitors to the conservation estate with data from DOC's hundreds of track counters, and publicly-available datasets from MBIE's International Visitor Survey. We're mostly using R, and learning lots about RMarkdown, Shiny apps and related topics.

We're heading into statistical training at DOC in the off-season, with the main innovation being a

largely web-based course we're calling "Data Wrangling using R".

We both attended last November's Ecological Society and NZSA conferences, conveniently in Christchurch. Ian organised a symposium on developments in environmental reporting in NZ. He contributed a talk updating progress applying propensity modelling to possum impacts at various levels of management, while Paul talked about master samples. The symposium featured as key-note the government statistician, Liz MacPherson, and included speakers from Ministry for the Environment, Landcare Research, a regional council and Jennifer Brown from University of Canterbury. Paul is heading shortly to North America to present at the International Statistical Ecology and International Biometric conferences, and escape the winter in his old home area.

On the personal front, Ian has set a date for formal retirement from DOC at the end of next April, but plans to continue to do some statistical work as long as there is demand for his input, from DOC or elsewhere. It has been some time since the last AgResearch news update, and you have probably heard news about AgResearch involving mass job relocations (mainly from Ruakura and Invermay (Mosgiel) to Lincoln but also some to Palmerston North), and then more recently mass job cuts of scientists. Well, most of the proposed relocations have not taken place yet - we are told that they will be happening over the next 3 or so years. Our new buildings at Lincoln and Palmerston North, to be located on the local university campuses, are still in the design stage. The Ruakura and Invermay campuses will continue to exist and even be upgraded, but staff numbers will be drastically reduced from present numbers. As for the job cuts of science staff, these took place over the first few months of 2016. The company budget had to be trimmed to respond to declining revenue, you see.

The good news is that the Statisticians at AgResearch are survivors of these upheavals, so far! At Invermay, **Ken Dodds** was recently promoted to "Eminent Scientist", the highest level for science staff, in recognition of "the great work he has done for the Statistical, Statistical Genetics, animal and other genomics communities, as well as the impact his work has created for the wider industry".

Ken offered a Summer Studentship project last summer in the area of statistical genomics, and the successful candidate, Massey student **Timothy Bilton**, did such a good job that Ken has offered him a PhD which he plans to start this year. There are no other full-time permanent statistics staff at Invermay, but **Graham Wood** and **Peter Johnstone**, and until recently **Neil Cox**, combine with Ken to 'look after' our scientist colleagues there. Officially retired, Neil moved back up to Hamilton earlier this year, and is even back in the office at Ruakura. Hopefully, we can soon report that we have secured the services of a new permanent statistician at Invermay, a vacancy that is long-standing.

At Lincoln, Alasdair Noble and Chikako van Koten hold the fort. You may well have seen the news last July of Special Olympics athlete Josie Noble (Alasdair's daughter) taking out New Zealand's first gold medal in the 100 metres freestyle at the World Summer Games.

At Palmerston North we still have, in order of length of service at AgR, John Koolaard, Dongwen Luo, Catherine Lloyd-West and Siva Ganesh.

At Ruakura, Vanessa Cave leads the team of stalwarts Martin Upsdell, Harold Henderson, Catherine Cameron, and also Maryann Pirie, who just got engaged to Paul Staincliffe, AgR's Records Manager. The team was joined by Waikato undergraduate statistics student, Clayton D'ath, who spent the summer analysing the GeoChip data from the 50 Pastures Project (http://www.soilmicronz.net/50-pasturesproject.html). So we statisticians are still in business, although the job relocations master plan (aka Future Footprint), which is set to create 'research hubs' at Lincoln and PNth, looms over our Ruakura and Invermay colleagues.



AgResearch Statisticians, Bioinformaticians, and Maths Modellers.

There have been a few changes at Plant and Food over the last year or so, with **Nihal di Silva**'s illness and death (*see his obituary in the January 2016 newsletter*), and **Sammie Jia** and **Alastair Noble** moving on to other jobs. We have been lucky in recruiting several good replacements: **Lindy Guo**, who had been working at AgResearch in Palmerston North is now at our Mt Albert site; **Peter Jaksons** came from a PhD at University of Canterbury to our Lincoln site; **Carmel Woods** moved from Statistics New Zealand in Christchurch to Lincoln; and recently **Kate Richards** finished her PhD at Massey and joined the team at Mt Albert.

In other news, **Esther Meenken** has also completed her PhD, and will be continuing her work on describing and quantifying uncertainty in biophysical computer simulation models in conjunction with our mathematical modellers.

Department of Mathematics and Statistics, University of Otago

by Austina Clark

Associate Professor **John Harraway** has completed 50 years continuous teaching in the Department of Mathematics and Statistics at Otago. To mark such a unique occasion the Division of Sciences organised a special party for John attended by all staff in the Department, retired staff and many colleagues around the University who John has collaborated with over the years. John is now working half time. He has had no sick leave day over the 50 year period and has lectured to an estimated 36422 students. Well done John.

Associate Professor **David Fletcher** has left Otago after 25 years to take up the Chair in Ecological Statistics at the University of Kent in England. Rumour has it that David first came to Otago after the ICOTS3 Conference in Dunedin which he enjoyed despite the dreadful weather during ICOTS3. We wish David well in his prestigious new position. We expect to see him back here from time to time as he has some PhD supervision to follow up, and he has kept his house in Dunedin.

Division of Health Sciences, University of Otago

by MATT FOSTER AND CLAIRE CAMERON

Sheila Williams retired on April 30th after 30 years with the Department of Preventive and Social Medicine, she will be missed. We welcome **Bryan Manly**, who joined Preventive and Social

Medicine on April 26th. Finally, congratulations to **James Stanley** of the Department of Public Health in Wellington; his twin girls Mila and Cora were born during the Easter break.

It's difficult to get much out of my colleagues from time to time, but vague threats and stand over tactics have yielded some bits and pieces I hope are of interest. It is mostly about comings and goings.

Starting at the top, **Martin Hazelton** writes that it has been a period of change for the Statistics group at Massey University in Palmerston North. **Chin-Diew Lai** and **Steve Haslett** have recently retired after many years of service to the Group (more of that below), and PhD students **Emily Kawabata** and **Kate Richards** have recently graduated and started new jobs. The desks in our postgraduate room did not remain vacant for long, with the arrival of new doctoral scholars **Ahmad Mahmoodjanlou**, **Gabriele Porta** and **Xin Zhou**. Filling the vacant staff positions has proven more difficult, but has ultimately proven successful. On that score, all will be revealed in the next newsletter!

Raj Govindaraju and **Geoff Jones** obtained funding for the second phase of their PGP-Fonterra scheme which started in 2011. Xin Zhou is the new recruit under this scheme who has started his PhD on the topic 'Fractional Nonconformance Assessment'. Xin Zhou is also advised by Roger Kissling, the Fonterra research associate.

It's nice to see some fresh faces, but we also have to look to the notable departures of Steve Haslett and Chin-Diew Lai. They have both been given Emeritus status by the University. See articles elsewhere in this newsletter on Chin-Diew Lai and Steve Haslett.

Waikato University

by Lyn Hunt

It is a while since we have had news of what has been happening here at Waikato. In 2015, **Murray Jorgensen** was awarded the title of Honorary Fellow of the University of Waikato. This was a well-deserved honour that recognised the significant contribution that Murray had made to both the University and the discipline of Statistics. Congratulations Murray. And we hope you will occasionally visit us at the Department.

We have also had the retirement of **Ray Littler** in December 2015. Ray has worked for many years at the University as a consulting statistician. Best wishes for your retirement, Ray. On 1 January 2016, the Statistics department was merged with the Mathematics department. So we are now in a Department of Mathematics and Statistics.

This year, we have had a visit from the Forder lecturer, **Dr Julia Gog** from DAMTP Cambridge. Julie presented two interesting seminars titled "Epidemics and viruses: the mathematics of disease" and "Spatial transmission of 2009 pandemic influenza in the US". In April, we also had **Professor Lovric** from the University of Kragujevac, Serbia, visit to give a seminar titled "On the Deficiencies and Controversies of Statistical Testing in Science". The Schools of Engineering and Computer & Mathematical Science were merged and School of Engineering, Computer and Mathematical Sciences was established in February, 2016. Professor **Enrico Haemmerle** is the head of the new school. As Enrico said, these fields complement each other, and the amalgamation will provide a point of difference to other universities. A couple of new appointments in Analytics are under process and hopefully we will have some exciting news in the next newsletter. The Master of Analytics introduced last year has been granted approval to award SAS accreditation. Students who complete four papers using SAS as a main tool are entitled to get the SAS accreditation.

The department of Mathematical Sciences, through **Murray Black**, hosted the Applied Mathematics sessions of National Science and Technology Forum in January. Six groups of 28, with one Australian in each group, received a session about the analytics behind analysing taste testing results while enjoying and scoring samples of chocolate and soft drink. They also received an astronomy talk from **Jordan Alexander** and **Mahmoud Mahmoud**. Our analytics offerings were promoted to these very keen Year 12 students from schools all around NZ. Many of these students were sponsored by Rotary Clubs.

Robin Hankin has been working on invertible functions from a finite set to itself, and 'spray', for manipulating multivariate polynomials using efficient numerical methods. He has been applying these tools to the megaminx (Figure 1 shows the super flip, a theoretically important configuration). He has also published the third series of posters for secondary schools, and has already started work on a series for 2017.



Figure 1: super flip

Professor Jeffrey Hunter was honoured at the International Workshop on Matrices and Statistics, held at the University of Madeira, Funchal, Madeira, over June 4-9, 2016, with a special session devoted to his 75th Birthday. The session was chaired by Professor Peter Taylor, University of Melbourne, Australia with additional contributions from Professor Stephen Kirkland, University of Manitoba, Canada, Professor Tugrul Dayar, University of Bilkent, Turkey and Professor Guy Latouche, Universite Libre de Bruxelles, Belgium. Jeff delivered a presentation "A fifty year journey with colleagues, generalized matrix inverses and applied probability" (see http://www.iwms.ipt.pt). Jeff also contributed to a memorial session celebrating the life of Ingram Olkin (1924-2016).



From Left: Professors Dayar, Latouche, Hunter, Taylor, Kirkland

Murray Jorgensen is now settled in at the Department of Mathematical Sciences and has been teaching and developing papers in text mining and forecasting. Apart from code transformation from Fortran to R, he has written a small note on Maximum Likelihood Estimation in the Olkin-Tate Location Model.

Kate Lee attended the SAS Data Science and Advanced Analytic Forum June 6-7, 2016 in London. The purpose of this forum was to understand what the industry needs from our graduate students and to discuss how to educate our students through the master program to deliver these needs. Aca-

demics and industry people from various places in the world participated.

Sarah Marshall is a member of the organizing committee of the 2016 Joint NZSA/ORSNZ Conference (27-30 November 2016) which is co-hosted by AUT's Department of Mathematical Sciences and the Department of Biostatistics and Epidemiology. Since late last year, she has been working on this conference with other committee members and we are looking forward to the NZSA/ORSNZ conference. She visited Dr **Stefanka Chukova** at Victoria University of Wellington in April 2016 to continue her collaboration.

Department of Statistics, The University of Auckland

by Julie Middleton

It was very big news all over the world when US-based researchers announced in early February that they that they had detected gravitational waves. And when they revealed their findings, via a live-streamed press conference, Department of Statistics Associate Professor **Renate Meyer** was up at 4.30am to watch it from her home in Auckland. Despite the early start, Associate Professor Meyer wouldn't have missed it. In the late 1990s, she was one of the researchers who laid the foundations for the sophisticated statistical data analysis strategies essential to the research. Read the full story here.

Professor **James Curran** has been elected a Fellow of the Chartered Society of Forensic Sciences for outstanding achievements in forensic science. To Professor Curran, the accolade is "recognition on the international stage of the regard in which my scientific peers and my professional community hold me and my work."

Professor **Thomas Lumley** has been made a Fellow of the Royal Society of New Zealand for his contributions both to statistical theory and to statistical practice. Professor Lumley, an Australian who moved to New Zealand and the university in 2010, says that it's an honour to be recognised in his new homeland. "It's also recognition for the statistics community - we aren't quite mathematicians, and aren't quite experimental scientists, so we can sometimes fall between the cracks." Read the full story here.

Statistics education expert Associate Professor Maxine Pfannkuch was recognised with a lifetime achievement award, the Campbell Award, at the New Zealand Statistical Association (NZSA) conference late last year. She says, "I work in the background as part of a collaborative team effort to improve statistics education, rather than working upfront. But I feel very honoured that people I respect have recognised not only my work, but also the importance of the field in which I work." Read the full story here. At the same conference, Dr Mark Holmes won the Littlejohn Award for research excellence. Dr Holmes has become a world expert in the theory of random walks and the analysis of high-dimensional models in statistical physics. In simpler terms, that means he studies random processes that accumulate over time, like the shape of the trail left by a randomly-moving point. His award commemorates Roger Littlejohn (1955-2011), a former NZSA president.

Associate Professor Rachel Fewster has gained

\$150,000 from the Ministry of Business, Innovation and Employment scheme Unlocking Curious Minds to develop an educational programme for primary-school aged children that aims to extend their skills from hands-on conservation to environmental strategy, using online data analysis tools and a computer game. The programme is called CatchIT-Schools.

For six months last year, US Fulbright Scholar to New Zealand Christine Franklin, a statistical education specialist at the University of Georgia (UGA), was hosted by the Department, where she worked closely with Associate Professor Maxine Pfannkuch. The stay proved a career highlight. Professor Franklin says: "Working with Maxine and other educators at the University of Auckland was the most incredible professional journey I have experienced in my 36-year academic career in higher education." Under the UGA International Faculty Exchange Grant scheme, Professor Franklin was back in New Zealand for several weeks in March, during which time she worked on a very full list of statistical education collaborations. Associate Professor Pfannkuch was on exchange at UGA in April.

A special issue of the New Zealand Journal of Ecology was released in January, documenting both the history and state-of-the-art of rodent eradications in New Zealand. It followed a University of Auckland hosted symposium in 2014 celebrating 50 years of rodent eradications in New Zealand. Dr James Russell from the School of Biological Sciences and Department of Statistics convened a special issue of the journal to collect important current papers on rodent eradications. The special issue was edited in association with the Department of Conservation Island Eradication Advisory Group. Read the full story here.

New faces

Dr **Mehdi Soleymani** has been appointed to a role as lecturer in data science. Dr Soleymani completed his undergraduate and masters degrees at Shahid Beheshti University in his native Iran, and his PhD at the University of Hong Kong, where he has spent the last six years. He has come to New Zealand with his wife, Nazafarin.

Ms Leila Boyle has returned to the Department of Statistics after 11 years teaching statistics at the University of Auckland's Student Learning Services, which provides workshops, online resources and advice for students to develop academic skills.

Visitors

As we mentioned in the last newsletter, Professor **Matthias Schonlau** is visiting from the University of Waterloo. We've since written a story about his work, aimed at a general audience, which you can read here.

Retirements

Matt Regan and Ross Parsonage have retired from the Department of Statistics. Associate Professors Brian McArdle, Maxine Pfannkuch and David Scott moved to part-time contracts at the beginning of April.





The Statistical Consulting Centre, Department of Statistics,

The University of Auckland, New Zealand,

presents the following two-day course:

Bayesian and Penalised Regression Methods for Epidemiological Analysis

Professor Sander Greenland

Thurs & Fri, 8 and 9 September 2016

Bayesian methods continue to become more popular in statistical modelling, but are not covered in most basic teaching. This lag may in part be due to common misconceptions (encouraged by most expositions) that Bayesian methods are conceptually distinct from frequentist methods and require special software. In fact, Bayesian methods are examples of penalized ("shrinkage") estimation and thus are perfectly acceptable frequentist methods; conversely, common frequentist methods are special types of Bayesian methods in which prior distributions are noninformative (so penalties are either zero or infinite). This short course will cover philosophy of statistics for epidemiology, illustrate the relationship between Bayesian and frequentist perspectives with real examples, and will show how penalization allows one to deal with a number of common problems that render ordinary statistical methods misleading for epidemiological research.

Regular registration fees are available until 15th July, late registration is available until 1st September.

For further information and to register please visit: <u>https://www.stat.auckland.ac.nz/en/about/statistical-consulting-</u> <u>centre/workshops1/bayesian.html</u>

For addition information email: rk.barraclough@auckland.ac.nz