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The New Zealand Statistical Association
Newsletter

Number 78 January 2017

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Welcome

by IAN WESTBROOKE

NZSA President

Thanks to you as NZSA members for electing me to succeed Martin Hazelton as your President. I feel honoured and a little daunted.

Reading through a draft of this newsletter, I see a theme of outreach: in joint conferences, in education activities and in local groups.

With ongoing and growing demand for statisticians and data analysts, a priority for our organization is to continue the projects that Martin Hazelton initiated during his recent term as President - continuing professional development, and mentoring. A key aspect is providing support and development for statisticians and analysts working in small groups or alone, who have limited direct support from other statisticians.

I attended both the New Zealand and Australian statistics conferences at the end of 2016, and was pleased to see collaboration and co-location with ORSNZ and with the Analytics Forum in Auckland; and with the 14th Australasian Data Mining conference in Canberra. I became more convinced that collaboration in the analytics/data science/ data mining area is essential. We as statisticians can strengthen and learn skills particularly on the computational side. And I am convinced we have a huge amount to contribute: our strong traditions in design, modelling and analysis are required for serious data science. Lots of data and/or computational power alone will not suffice.

Plans afoot for mentoring, professional development (http://www.stats.org.nz/about/continuing-professional-development) and further collaborative conferences provide starting points for NZSA to play its part.

I look forward to working with many of you. Our strength lies in a wide range of our members working together to further statistics and data science, and reaching out to those we can assist and collaborate with. We can only achieve our aims when you as an NZSA member join with others in action to continue the great work.

A final word ...

by MARTIN HAZELTON,
NZSA Past-President

In the words of the late, great Douglas Adams, “So long, and thanks for all the fish". Yes, my time as NZSA President is at an end. I can now take a holiday, or (closer to the truth) get on with some other jobs I have been neglecting. My principal aim as President (beyond ensuring that the Association continue with its everyday activities) was to establish some schemes to assist early career NZSA members, particularly those working alone or in a small group of statisticians in large organizations. I did not get as far as I had hoped. Nonetheless, working parties have now produced reports on the possible shape of NZSA mentoring schemes, and on provision of an increased number of professional development short courses. Hopefully incoming President Ian Westbrooke will find this work a useful foundation on which to build.

My thanks go to all the members of the NZSA Executive Committees from 2015 and 2016 for their support. I am particularly indebted to Howard Edwards for his superb work as Treasurer. The Association accounts are now in good order and the finances from the 2014 and 2015 conferences are complete. Howard also smoothly managed the increased reporting requirements imposed by the Charities Commission. My next mention is John Haywood, who did a fine job as Secretary. Both the 2015 and 2016 NZSA/ORSNZ Conferences were great successes, thanks primarily to the efforts of Richard Penny (University of Canterbury 2015) Priya Parmar and Sarah Marshall (AUT 2016) and their teams of helpers. Vanessa Cave and Catherine Lloyd-West have kept the NZSA website ticking over. Alasdair Noble and Mike Camden have done a superb job ensuring that the NZSA Education Committee is active and effective. Steffan Klaere and Marie Fitch have edited some excellent newsletters. James Curran ran the Awards Committee with his customary good sense and efficiency. My final thanks go to Harold Henderson, who I could always rely on for excellent advice in addition to his work as membership secretary.

Have a great summer.

Editorial

by Marie Fitch

I hope you have all had (or maybe are still having) a restful summer break.

I recently read a blog which amongst other things said: “While data can influence us, a true story told well has the power to persuade us in ways that data can’t." (You can read the whole blog by Michael Stoner on the *Call to action: Marketing and communication in Higher Education* blog at www.insidehighered.com.) Although he was talking about the value of liberal arts education it got me thinking about the usefulness of statistics and how (or not) we communicate this to others. Do we tell the story well or expect the data to speak for itself? Of course he is talking about more than just telling the story of the data, the stories of the people are often the ‘hooks’ that grab us. Where are our stories? This newsletter is one place where they can be told. Contributions welcome!!

As always I have enjoyed putting the newsletter together and reading about the diverse things happening across our New Zealand statistics community, but I am sure there is more happening. If you know of items of interest not being reported please consider sending in a contribution for the next newsletter. Contributions are welcome at any point, but will be needed by the end of May for inclusion in the June newsletter.

Ngā mihi,

Marie

Marie (right) with colleagues Stephanie Budgett (left) and Renata Meyer (centre) at the November 2016 NZSA conference.

Conferences

NZSA Conference 2016

Report from the local organising committee co-chairs

The Joint NZSA+ORSNZ Conference was held at AUT between 27-30th November. The conference, which was chaired by Dr Sarah Marshall (Department of Mathematical Sciences) and Dr Priya Parmar (Department of Biostatistics and Epidemiology), welcomed over 200 delegates, primarily from NZ universities. The Sir Paul Reeves Building provided an excellent venue for the conference.

Highlights of the conference included the keynote sessions by Professor Di Cook (Monash University), Dr Michael O'Sullivan (University of Auckland), Dr Kevin Ross (Orion Health), Professor Rhema Vaithianathan (AUT), and Professor David Morton (Northwestern University); and a data journalism discussion panel featuring Harkanwal Singh (NZ Herald), Keith Ng (On Point), Lillian Grace (Figure NZ), Allan Lee (AUT lecturer in journalism), Professor Di Cook (Monash University) and Professor Thomas Lumley (University of Auckland).

There were 115 contributed talks by academics, practitioners and students from New Zealand and abroad. On 1st December two post-conference workshops were held at AUT's city campus. Professor Di Cook ran a computer-based workshop and shared her expertise in the area of R and data visualisation with 18 participants. A Health Analytics Workshop, sponsored by Te Pūnaha Matatini and Precision Driven Health, was attended by 46 delegates and provided an excellent networking opportunity for academics and practitioners.

by SARAH MARSHALL AND PRIYA PARMAR

Reports from conference attendees

The brief: "Could you please write a paragraph about the conference for the next NZSA newsletter."

The Conference was well organized. It was my first experience of attending any conference in New Zealand. *(Amir arrived in New Zealand, from Pakistan in May 2016.)* There were some very high profile speakers, especially in the Plenary sessions; and their talks were very motivating. The presentations covered diverse fields of Statistics. This meant that delegates had the chance to attend presentations of their own choice. I like to see NZSA attracting more and more presenters from other countries. Some presenters took more than the allocated time, resulting in no question/answer session. It would be good if the time limit for the presentation was more strictly followed. The conference was a success overall.

by AMIR BASHIR,
PHD STUDENT, MASSEY UNIVERSITY, ALBANY

The joint NZSA and ORSNZ meeting this year was delightful, as was the conference venue in the architecturally stunning Sir Paul Reeves Building of the modern AUT campus. A highlight for me was Di Cook's plenary talk "*Statistics on street corners*" that remarkably demonstrated how crowd sourcing can be harnessed to make formal statistical inference about patterns in plots. I only wish that I had the time to attend her post-conference workshop on data visualization! The meeting held many "known knowns" such as our ubiquitous Harold Henderson taking every opportunity for photo shots, Murray Jorgensen's update on new developments of the EM algorithm, catching up with colleagues from other NZ and Australian Universities, and many interesting talks on statistical theory, survival analysis, Bayesian methods and MCMC which were inevitably often scheduled in parallel sessions. "Known unknowns" for me were interesting sessions on health economics, tourism analytics, and combinatorial and multicriteria optimization which provided insights into these areas. But it is the "unknown unknowns" which make all conferences exciting, such as meeting new people with joint research interests. I am looking forward to catching up again next year at the IASC-ARS/NZSA in Auckland.

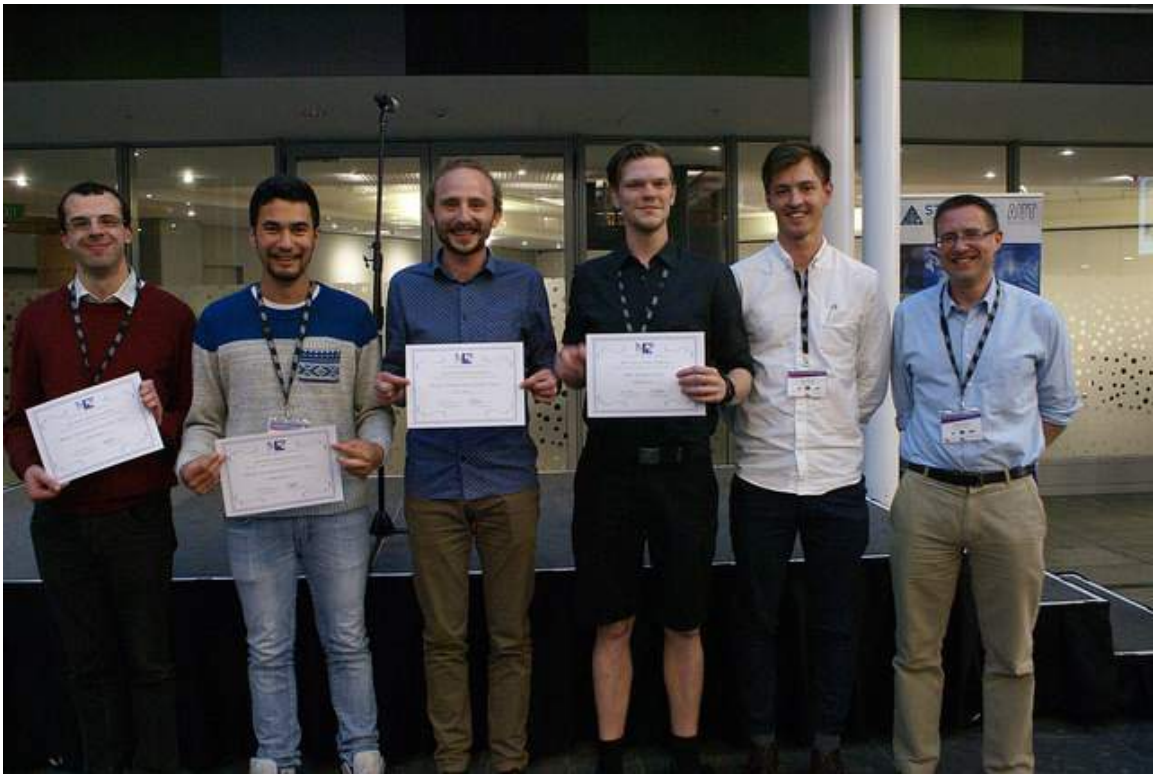
by RENATE MEYER, UNIVERSITY OF AUCKLAND

Yet another enjoyable Conference for me. The venue and the organisers were great and I was made to feel very welcome. As one of the judges of the student prizes I attended a lot of student talks and was, as usual, very impressed with the overall standard. I wished there had been some student talks on the Wednesday morning as the lack of them meant I heard a number of seasoned academics speak and the student talks left them for dead! A highlight was accepting the Campbell award on behalf of Mike Camden who I have worked with on the education committee for many years - a very worthy recipient and in his absence I was happy to accept it.

It is always good to catch up with colleagues from around the country and to meet new ones; networking is probably the most useful outcome.

by ALASDAIR NOBLE, AGRESEARCH

A report on (and photographs of) the winners of the three NZSA awards can be found later in the Newsletter, here.



Student talk prize winners (from left): Alastair Lamont (University of Otago), Matt Edwards (University of Auckland), Oscar Dowson (University of Auckland), Niffe Hermannson (University of Auckland) with Sam Caldwell (Harmonic Analytics) and Martin Hazelton (NZSA President)

See more photos from the 2016 conference:
https://www.flickr.com/photos/111101747@N06/sets/72157673204688373

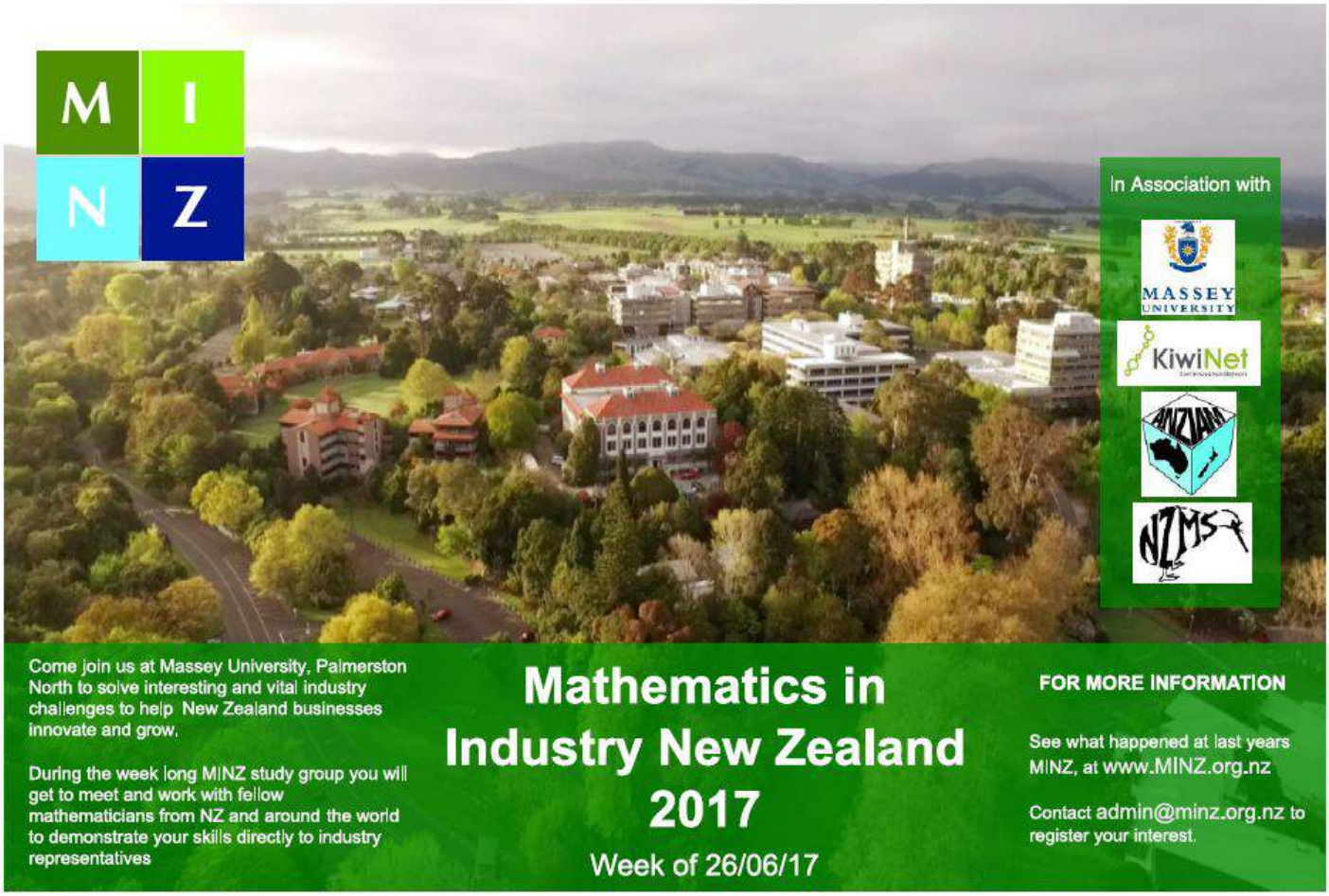
Coming Conferences

2017 IARSC-ARS/NZSA Conference

The New Zealand Statistical Association (NZSA) and the International Association of Statistical Computing (Asian Regional Society) are holding a joint conference hosted by the Department of Statistics, The University of Auckland at their city campus from Sunday 10th December – Thursday 14th December 2017.

This conference incorporates both the 68th Annual NZSA Conference and the 10th Conference of the IASC (ARS). More information is available on the conference website: www.nzsa2017.com

The conference marks the retirement of Ross Ihaka, one of the two co-founders of R. An evening welcome reception will be held on Sunday 10th December. The conference presentations and other events will be held from Monday 11th to Thursday 14 December 2017.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N Z
In Association with
MASSEY UNIVERSITY
KiwiNet
ANZIAM
NZMS
Come join us at Massey University, Palmerston North to solve interesting and vital industry challenges to help New Zealand businesses innovate and grow.
During the week long MINZ study group you will get to meet and work with fellow mathematicians from NZ and around the world to demonstrate your skills directly to industry representatives
Mathematics in Industry New Zealand 2017
Week of 26/06/17
FOR MORE INFORMATION
See what happened at last years MINZ, at www.MINZ.org.nz
Contact admin@minz.org.nz to register your interest.

Stories of interest

NZSA Awards 2016

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. The criteria for the award are: i) publication of an exceptional body of original statistical research undertaken within NZ; or, ii) a prolonged and outstanding contribution to statistical education; or, iii) playing a key role in consulting on major, innovative research projects that has direct relevance to NZ; or, iv) making a leading contribution to the promotion of statistics within NZ over a sustained period.

Mike Camden

Mike Camden has been New Zealand's most tireless front-line warrior for the cause of real-and-relevant statistics education in our schools for well over a quarter of a century. For all of that time he has been "Mr Education Committee". The high school educational approaches championed by Mike and his collaborators have been progressively adopted around the world. Statistics education in New Zealand has a high reputation internationally and the Education Committee is well respected by sister organisations in many countries. This, in turn, helps to support the international reputation of the NZSA.

Worsley Early Career Award

This award recognizes outstanding recent published research from a New Zealand statistician in the early stages of their career. In particular, applicants must be within seven years of confirmation of their PhD. This honour has been bestowed on some very fine young researchers since its establishment in 2013, and this year's winner well deserves to join their ranks.

Dr Yalu Wen

University of Auckland

Yalu Wen is an outstanding researcher in statistical genetics. Her spatial and U-statistic-based models have been published in top-ranked journals in the field, such as Genetic Epidemiology and Bioinformatics, and a patent is granted for her genotype calling algorithm.

Littlejohn Research Award

The Littlejohn Research Award is the Association's senior research honour. It is awarded based on the nominee's best five publications in the past 5 years. The Awards Committee was presented with a particularly difficult decision this year, choosing between some excellent candidates.

Associate Professor Geoff Jones

Massey University

Geoff Jones is an extraordinarily versatile statistical researcher. His work ranges from important theoretical contributions on diagnostic testing and model identifiability through to a variety of statistical applications. Characteristically, his methodological research addresses real problems generated by interesting datasets.

Geoff with Martin Hazelton

Royal Society of New Zealand Jones medal

'Scott one of the best' *was the headline on the front page of the November 19, 2016 edition of the* ***Te Awamutu Courier****. The article that followed celebrated the awarding of the Royal Society of New Zealand Jones medal to the University of Auckland's Emeritus Professor Alastair Scott. The article is reproduced here with their permission.*

Almost six decades ago Alastair Scott was named Te Awamutu College Dux and was the school's first recipient of a University Scholarship.

Now the Emeritus Professor at Auckland University has been awarded the Jones Medal by the Royal Society of New Zealand, for his lifetime contribution to statistics in New Zealand and overseas.

The medal selection committee acknowledged that Professor Scott (FRSNZ) is among the very best statisticians New Zealand has produced and he is a world leader in the areas of survey sampling theory and analysis of case control studies.

His methods are applied in a wide range of areas and he has contributed substantially to research in public health. Professor Scott's work has particular relevance to obtaining reliable data from sampling, developing effective and simple methods that can take account of survey design features and deal with missing data. His 1981 paper on categorical survey data was recognised as one of the 19 landmark papers in survey sampling by the International Association of Survey Statisticians in their 2001 Centenary volume. These methods, developed with Professor Rao, called Rao-Scott adjustments are widely used and incorporated in several software packages for survey data analysis.

In addition to developing a large body of novel and important statistical methodologies, he has been an advisor to official agencies nationally and internationally, including Statistics NZ, The Australian Bureau of Statistics and Statistics Canada. He served as principal investigator on the New Zealand Quality of Health Case Study and the National Primary Medical Care Survey.

"We are all absolutely delighted that Alastair was the recipient of the Jones Medal this year," says University of Auckland head of the Department of Statistics, Associate Professor Ilze Ziedins. "It's wonderful to see Alastair's contribution to research and leadership, within New Zealand and internationally, recognized by the award."

When receiving the Jones Medal, Professor Scott said he felt honoured to receive an award named for our most celebrated mathematician, Sir Vaughan Jones. "This new connection with Vaughan also gives me personal pleasure," he said. "The best class I ever taught, my first on returning to New Zealand in 1972, contained both Vaughan and his great friend, Keith Worsley (FRSC), my most successful PhD student."

Professor Scott was first employed by the University of Auckland in 1972 and was Head of Statistics for eight years. He has continued to work and advise in his retirement.

He began his career in the Applied Mathematics Division of DSIR before lecturing at the London School of Economics.

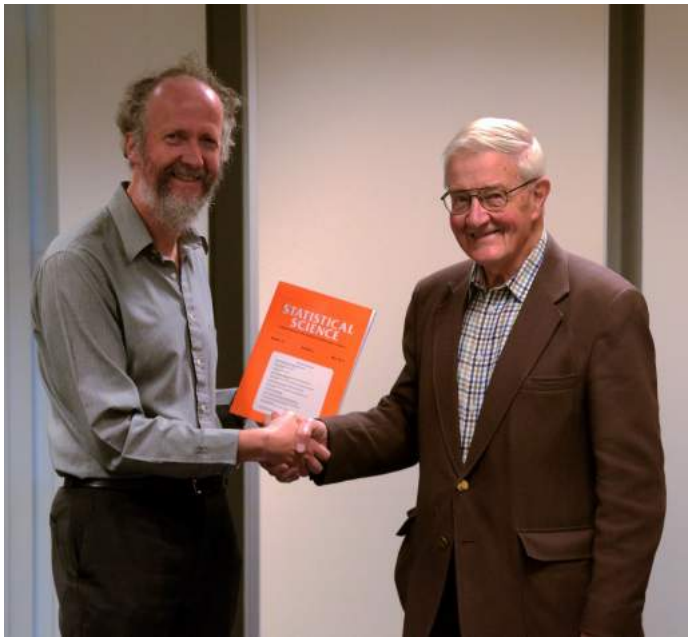
Professor Scott has been awarded many visiting positions. He is a Fellow of the Royal Society of New Zealand, the American Statistical Association, the Institute of Mathematical Statistics and the Royal Statistical Society, an Honorary Life Member of the New Zealand Statistical Association and received its premier award, the Campbell Prize, in 2012. In 2006 he received the prestigious Waksberg Award from the American Statistical Association and Statistical Society of Canada for outstanding contributions to survey methodology.

50th anniversary of the Cormack-Jolly-Seber model

by RACHEL FEWSTER

Just over 50 years ago, three papers appeared which independently described the fundamental approach for analyzing capture-recapture data. It is now called the Cormack-Jolly-Seber model. This anniversary is celebrated in the second issue of Statistical Science, 2016, guest edited by Steve Buckland and Byron Morgan. It features transcribed interviews with George Seber and Richard Cormack. In addition there are eight research papers that demonstrate how the capture- recapture area is still developing, with applications to genetics, social and medical areas, as well as ecology.

Rachel Fewster, a co-author of two of the papers in the issue, presenting a copy to George, in the University of Auckland



Steve presenting a copy of the issue to Richard, in St Andrews University

Byron presenting two copies to George Jolly's two daughters Heather Hannah and Fiona Davies. A third copy goes to their brother David Jolly, who lives in Saudi Arabia.

(Those interested in reading more of George's life and work may also like to read Richard Barker's interview with George Seber which appeared in Statistical Science 2016, Vol. 31, No. 2, 151-160. Ed.)

NSZA+ORNZ conference history

*The following is an excerpt from **Professor Jeffrey Hunter**'s welcome and opening remarks at the 2016 Joint NSZA+ORNZ conference*

"As stated in the conference programme this is a significant event - the first time either the NZSA or the ORSNZ has met at AUT. It's the 50th annual conference of the ORSNZ and the 67th of the NZSA.

There are some other significant events but let me give you a potted history of our organisations.

The NZSA was established in 1949 with annual meetings thereafter in Wellington until 1984, followed by a meeting in Auckland in 1985 during the Pacific Statistical Congress.

Following the establishment of the ORSNZ, it met annually with the NZSA in Wellington from 1965 until 1971 when it then started to meet by itself in Wellington from 1972.

I joined both societies in 1969 - one of only a handful that have had joint involvement with both organisations over the years.

As the ORSNZ began to establish a number of branches it started to meet annually in different locations around the country including Wellington, then Canterbury firstly in 1974, Auckland firstly in 1976 with Hamilton for the first time in 1990.

The first joint meeting of NZSA and ORSNZ in the "modern era" was in 1994 following a 23 year gap. That meeting was held at Massey University in Palmerston North and I was the Chair of the joint Conference committee. I also introduced the Vice Chancellor, Dr (later Sir) Neil Waters to open the conference.

It took another 19 years for the next joint meeting - 2013 at Waikato University, followed by 2014 in Wellington and last year, 2015, in Christchurch.

I gather that the associations will be looking for separate venues next year.

The fact that we have been meeting jointly in recent years is possibly due to the emergence of "data science" (typically of a statistical nature) and "analytics" (typically the application of quantitative techniques to business and industry). The component Societies both have a role to play in these newly emerging areas with both of them heavily dependent on statistical and operational research techniques. The time has come for both of these areas to cooperate together - no one discipline area has all the answers and if we couple this with the heavy dependence that we all have on computers and computer power it is obvious that our disciplines will continue to develop and reinforce each other."

Before introducing Dr Priya Parmar and Dr Sarah Marshall as Co-chairs of the Conference Organising Committee, Professor Hunter finished his presentation by describing the development of the mathematical sciences at AUT - the closing of a straight Statistics undergraduate major, the establishment of undergraduate majors in analytics and applied mathematics and, from last year, the introduction of the Master of Analytics degree, and commenting on the rapid growth in these programmes. He also announced the appointment of Professor Irene Hudson as the new Professor of Statistics and Analytics within the Department of Mathematical Sciences, AUT, from the beginning of 2017.

News from the Statistics Education Teams

Statistics Education News, December 2016

by MAXINE PFANNKUCH

International News

International Congress on Mathematical Education 2016, 24-31 July in Hamburg. IASE organized two topic study groups, statistics and probability. Stephanie Budgett, Auckland University, and Pip Arnold, Cognition Education, presented papers in the statistics topic study group and consequently were invited to submit a chapter for an ICME-13 Monograph.

OZCOTS, 8-9 December 2016 in Canberra, Australia. Rachel Passmore, Auckland University presented a paper on time series in the NZ school curriculum and John Harraway (Otago University) a paper on a university project. Ian Westbrooke (Dept of Conservation) and Peter Ellis (MBIE) presented papers reflecting on their experiences teaching statistics in their respective workplaces. A large contingent of New Zealanders attended, including: Marie Fitch, Christine Millar, Liza Bolton and Joss Cumming (Auckland University) and Jennifer Brown, Carl Scarrott, Marco Reale, Blair Robertson, Daniel Gerhard and Hilary Seddon (Canterbury University). An ANZCOTS is now being proposed.

The **10th International Research Forum on Statistical Reasoning, Thinking and Literacy** will be held from 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/)

IASE 2017 Satellite Conference, 11-14 July in Rabat, Morocco. The theme of the conference is Teaching statistics in a data rich world and currently there is a call for papers, with a submission of an abstract required by January 14, 2017. See: http://iase-web.org/conference/satellite17/

Local News

Statistics Teacher Day, 25 November 2016, Auckland. The Department of Statistics, Auckland University and the Auckland Mathematics Association organized and ran a very successful Statistics Teacher Day with over 340 teachers attending. The day was very ably led by the convenors, **Marie Fitch** and **Anna Fergusson**, Auckland University. This year a new innovation was to offer workshop themes, one of which was four consecutive workshops for teachers new to teaching statistics. These theme-based workshops seemed to be welcomed by teachers. The plenary speaker was **Prof Di Cook**, Monash University who gave a very well received talk on: "The role of open data, open source software and data visualization in developing quantitative citizenship".

Other regional associations that ran mathematics and statistics teacher days at the end of 2016 were the Bay of Plenty Mathematics Association, Wellington Mathematics Association where **Chris Wild** was plenary speaker, Canterbury Mathemat-

ics Association, and the Otago Mathematics Association where Anna Fergusson was invited to present three workshops on teaching statistics and probability.

People in statistics education research. **Maxine Pfannkuch** visited Prof Christine Franklin at the University of Georgia, USA, for two weeks in September 2016 as part of an International Faculty Exchange scheme. Dr Honor Young, Dr Marco Pomati and Rhys Jones from Cardiff University visited Auckland University in December 2016 as part of a Q-step initiative to improve sociology students' quantitative skills. In 2014 Maxine Pfannkuch and **Stephanie Budgett** were invited to Cardiff University to talk about a course they had developed, Lies, Damned Lies and Statistics, which Cardiff University consequently used to introduce sociology students to statistical ideas. At the Statistics Teacher Day in Auckland in November, Anna Fergusson, Auckland University, presented her Master's dissertation research findings on how some teachers assess goodness of fit and on an interactive tool she developed, while **Malia Puloka**, Mangere College, presented her Master's thesis findings on some Year 13 students' understanding of probability when using an interactive eikosogram.

CensusAtSchool Project. The CensusAtSchool project is preparing for the 2017 survey of NZ school students, with 30,000 of them expected to participate. 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

FutureLearn MOOC - Data to Insight: An Introduction to Data Analysis. Chris Wild, University of Auckland, with the assistance of **Mike Forster** is again running this eight-week course, from October to December 2016. The course is centered on his innovative software iNZight and had 13,900 students registered.

NZSA Education Committee, December 2016

by Mike Camden

Our fresh new purpose statement (http://www.stats.org.nz/committees/education) says that we proactively seek out and assess new opportunities for statistics education. We see plenty of opportunities for that. You'll find details in the new Annual Report (http://www.stats.org.nz/site/uploads/NZSA-Education-Committee-Annual-Report-2016.pdf), and below.

Would you like to know what we think the essence of statistics education is, and how that differs from the essence of the rest of mathematics education? Here it is, all on one page: http://new.censusatschool.org.nz/2016/08/24/.

We met with the Ministry of Education's mathematics and statistics specialists in June. Issues of common interest included these:

- the teacher shortage in STEM subjects
- the messages we give graduates about teaching as a profession
- how learning experiences with mathematics and statistics need to be be positive and engaging
- professional development, and school involvement in identifying needs for this
- possibilities of support for teachers through networks of expertise, communities of learning, an enquiry approach, use of mentors
- the need for an accreditation process to require knowledge of statistics education research
- the need to deliver education for teachers on a larger scale
- statistics as a really powerful vehicle for breaking down subject silos
- the potential to assess more than one stan-

dard within mathematics and statistics from the same task, and across different subject areas
- how cross-curricula learning helps makes statistics learning real and exciting.

We are progressing our liaison with the Joint ASA/NCTM Committee in the USA. Synergies include possible collaboration on a new book for teachers on modelling, and the ASA's new online journal *The Statistics Teacher*. Please see separate article on this collaboration and Anna's visit to ASA. We are interested in the possibilities for an online journal here, where teachers could publish peer-reviewed lesson plans. This would resemble the ASA/NCTM one: https://www.amstat.org/education/stew/.

We're actively concerned about:

- the NCEA external assessments (i.e., exams) that took place in November, and how they're evolving towards the 'thinking' spirit of the Curriculum
- NZQA's ongoing plans for digital assessment, and how that could further enliven statistics assessments and learning
- the NZAMT conference in October 2017: Back to the Future. (http://www.nzamt2017.com/) NZSA is supporting Christine Franklin's plenary presentation there
- improvements to the e-asTTle tests (https://e-asttle.tki.org.nz/) for primary mathematics and statistics
- TLIF: the teacher led innovation fund: http://www.education.govt.nz/ministry-of-education/specific-initiatives/investing-in-educational-success/teacher-led-innovation-fund/
- and also: statistics in primary school, supply of datasets, big data, the future, probability, and time series.

Several members attended the SSA's STEMS2016 colloquium in June. See report in the last Newsletter. Proposals for improving statistical education will emerge. We'll note them with interest, and make use of them.

Alex Neill retired from NZCER in June this year. Alex has been an active member and chair of this committee since the early 1990s. He has contributed many insights into how statistics learning can work in primary and middle school. He was a vital part of the very small committee that guided and supported teachers and officials through the implementation of the 1992 *Mathematics in the New Zealand Curriculum* ('The Burgundy Bible').He played a large part in building the good relations with the Ministry of Education that were so valuable during the curriculum-writing years (the early 2000s). Best wishes, Alex.

NZSA education committee collaboration with ASA-NCTM joint committee on curriculum in statistics and probability

by Anna Fergusson

In March, the NZSA education committee had an extra meeting, to coincide with the visit of Christine Franklin, chair of the joint ASA/NCTM joint committee and ASA K-12 statistical ambassador. During this meeting, we discussed liaison and ongoing collaboration between our two committees. Christine will remain in contact as the ASA-NCTM liaison with our committee, and Maxine Pfannkuch will be our contact and liaison with the USA committee.

As part of our collaboration, Anna Fergusson attended the Joint Statistical Meeting (JSM) in Chicago and presented at the Meeting Within a Meeting event, a two day workshop programme for middle school and high school teachers. The ASA/NCTM committee funded Anna's travel and attendance. The US teachers were enthusiastic about Anna's presentations and her sharing about what is happening statistics education in NZ schools. Anna also gave a presentation to the ASA board of directors. The ASA board and President (Jessica Utts) were very positive about and complimentary of the 'cutting edge' nature of NZ statistics education and plans for collaboration between the committees. Our collaboration was also discussed at the ASA statistics education section meeting at the JSM.

There are plans for the two committees to further collaborate on activities and resources that will benefit both New Zealand and the international statistics education community.

Ron Wasserstein (ASA Executive Director), Anna Fergusson (University of Auckland), Christine Franklin (ASA K-12 Statistical Ambassador, Chair of ASA-NCTM Joint Committee on curriculum in statistics and probability)

Local News

Statistics at ...

Department of Conservation

by PAUL VAN DAM-BATES

It's been another busy year at DOC. **Ian** and I have developed a "Data Wrangling in R" mixed delivery class for teaching R programming skills within the Department. Ian has presented our initial results at the Australian Conference on Teach Statistics (OZCOTS) if anyone is interested in this. A large chunk of our time has been on automated reporting using R. This includes building standardised markdown templates for PDF and HTML as well as integrating R directly with HTML/JavaScript. Examples are already online for our annual report and there are more to come. Ian has automated reporting on the International Visitor Survey and I have been working on our national biodiversity data as well as a national network of track counters. I shared this work in Seattle WA, over the winter, at the International Statistical Ecology Conference (ISEC). One of my other focuses has been working with **Blair Robertson** at the University of Canterbury on a design for New Zealand biodiversity management monitoring using Balanced Acceptance Sampling. This work was presented in Victoria BC at the International Biometric Conference (IBC).

Ian moves closer to retirement but is remaining very active. He has been working on modelling trends in injuries at DOC to help improve health and safety within the department. He was also just elected President of the NZSA, the first non-academic for quite a while. Our focus within the Department remains the same; offering statistical advice and training as well as working on some bigger projects in our support role. At the annual NZSA meeting Ian presented some ideas about training the current workforce based on his years of beating DOC's ecologists into statistical submission. I discussed some occupancy modelling we have been doing with **Andrew Gormley** at Landcare Research to report on New Zealand's status and trend of birds and mammals.

AgResearch Statistics Group

by JOHN KOOLAARD

The AgResearch team of statisticians has largely continued on since our last update despite a large number of science job cuts across the Institute in late 2015 and early 2016. There was one very notable exception however - the retirement of **Neil Cox**. Neil joined MAF (predecessor of AgResearch) at Ruakura in 1971 as a Biometrician, following a stint of summer vacation work in 1969-70. Leading up to this, he had won a University Scholarship and gained direct entry into the second year courses at the University of Auckland where he completed a BSc and MSc (Hons) in mathematics. In 1972 he was awarded a New Zealand National Research Advisory Council Post-graduate Fellowship to complete (1972-5) a PhD with now Professor Sir David Cox at Imperial College in London. (He travelled to London by sea!). Neil returned to Ruakura in 1975 where he remained until 2011, when he moved to AgResearch's Invermay, Mosgiel, campus. Neil briefly returned to Ruakura this year having decided to return to the Waikato for his retirement. Neil has made an enormous contribution to agricultural research and the statistical community over his long career. We wish Neil and Stephanie all the best for retirement.

Looking back over his career at his 40th anniversary of working at Ruakura in 2011, Neil commented: "I feel really fortunate to have been able to be involved in the exciting research done there. It has been a real privilege to work with so many fantastic people. In my 40 years here, the organisational structures around us have changed often. Our little team has been lucky enough to carry on our work relatively unaffected by these changes; we know that will continue only if we continue to add real value to the science teams we work with and continue to remain valued by the people in those teams."

Neil Cox

The other exception was **Graham Wood**, who was part of our Invermay team for a few years and is now contributing his expertise at the University of Otago.

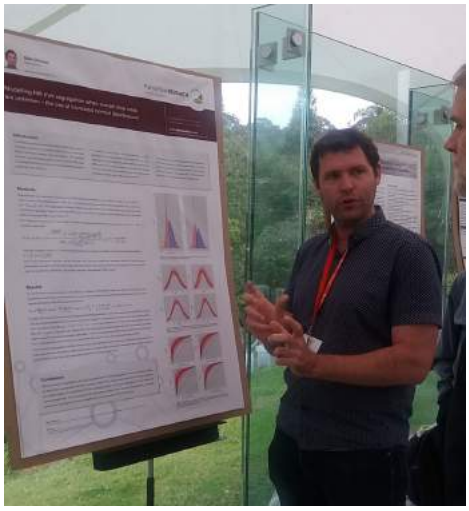
We also had a PhD student join us in September - **Timothy Bilton** - who is based at our Invermay campus. His PhD is on developing statistical methods for genetic analysis using genotyping-by-sequencing data and he will be guided in this by **Ken Dodds** and also **Matthew Schofield** and **Mik Black** from the University of Otago.

Timothy Bilton

Plant and Food

by Duncan Hedderley

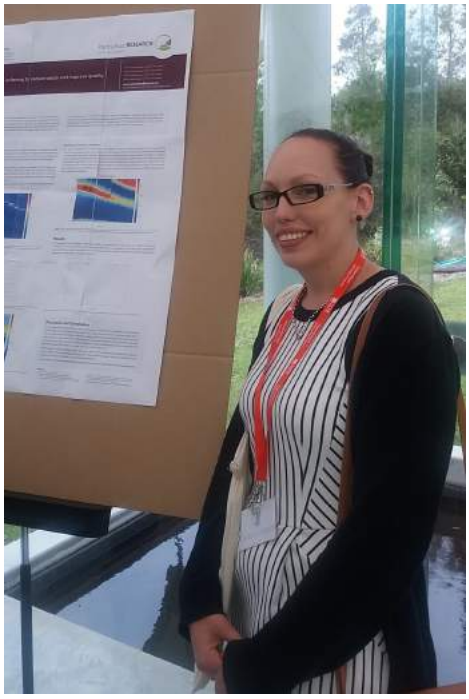
Our main news is that **Linley Jesson** has joined the team, based at our Havelock North site. Linley is a returning Kiwi, who has worked in Canada (University of New Brunswick) and Germany (on a Humboldt fellowship), and brings a range of skills in genomics and ecological statistics.



Mark Wohlers

Left to right: Kate Richards, Ruth Butler, Peter Jaksons, Linley Jesson, Andrew McLachlan and Mark Wohlers

Ruth Butler



Kate Richards

Thanks to Linley Jesson and Ron van Toor for these photos.

Statistics Research Associates

by ROBERT DAVIES

Statistics Research Associates is a small statistics research and consulting company originally set up in 1999 by statisticians formerly with Victoria University and DSIR.

The big change in 2016 was that **John Maindonald** has joined us, bringing a wealth of knowledge, experience and enthusiasm.

David Vere-Jones has stepped down as a director and shareholder but remains a valued member of the SRA family.

David Harte left us several years ago, to join GNS Science, but remains a shareholder and a member of the SRA family.

Wellington Statistics Group

by JOHN HAYWOOD

The Wellington Statistics Group had a pretty quiet year in 2016, with the following meetings organised or promoted:

- 28 June, **Miodrag Lovric** (University of Kragujevac, Serbia), "On the resolution of statistical controversies and paradoxes in statistical testing in science". See more about Miodrag's various activities on his website: http://www.ekfak.kg.ac.rs/mlovric/
- 8 September, **Emily Mason** and **Kylie Maxwell** (Social Investment Unit, Wellington), "Changing the world with numbers - being part of a social investment analytics team". A link to Emily and Kylie's presentation is here.

Further details on various WSG activities and contact details can be found on the NZSA Local Groups web page: http://stats.org.nz/events/local-groups

Department of Mathematics and Statistics, University of Otago

by Austina Clark

"*The book of R*", written by **Dr Tilman Davis**, was published in July, this year. This book has received some very good reviews, one of which is given below: "Extremely well written with excellent explanations and examples, this book fully accomplishes the goal of providing the reader with both the programming and statistical skills required to become proficient with this language. I am nothing short of amazed at the consistent quality and clarity of the text and the utility of the exercises." *-Computerworld*

The University of Otago has selected **Professor Richard Barker** as the next Pro-Vice-Chancellor of its Division of Sciences. Professor Barker holds the Chair in Statistics in the Division's Department of Mathematics and Statistics. He will take up the role from the New Year.

Dr Phillip Wilcox along with **Dr Mik Black** organized a one day Quantitative Genetics Symposium held at Dunedin on 7 December, with talks on the most up to date and exciting research from AbacusBio, Beef and Lamb NZ Genetics, AgResearch and the University of Otago. There were about 65 participants and it was a very good opportunity for the people working in this field around Dunedin to learn what other people were doing.

Genevera Allen visit to Otago

by Matt Parry

Genevera Allen visited the University of Otago, March 21-24, 2016. Genevera is one of the rising stars of statistics and works in a number of areas including neuroimaging, bioinformatics, machine learning and theoretical statistics. She is an Assistant Professor at Rice University in the Depts of Statistics and Electrical and Computer Engineering (by courtesy) and at the Baylor College of Medicine in the Dept of Pediatrics-Neurology. She is also a member of the Jan and Dan Duncan Neurological Research Institute at Texas Children's Hospital.

Despite being on sabbatical, Genevera generously agreed to a very busy seminar schedule, plus informal discussions and meetings with students.

(Photo courtesy of http://www.stat.rice.edu/ gallen/)

Genevera was hosted by a different University department each day. She spoke about population inference for brain networks, statistical learning for integrative cancer genomics, convex biclustering, within group variable selection via the exclusive lasso, and mixed graphical models. Genevera reports that our students are very quiet compared to their counterparts in the US!

Genevera was invited to Otago by Matt Parry of the Dept of Mathematics and Statistics. Her visit was also supported by the Depts of Preventive and Social Medicine, Biochemistry, Computer Science and Information Science.

Genevera is definitely open to a return visit to NZ. She was very keen to see mountains and travelled from Dunedin to Christchurch via the West Coast, but low-lying cloud for her entire trip meant she never saw the Southern Alps.

Massey University, Palmerston North

by JONATHAN GODFREY

It's hard to find out what everyone has been doing without seriously standing over some of them. This was made even more difficult as I was doing it while I was overseas myself. I did suggest writing some fiction based on the news stories I was seeing on Irish TV, and I have to say that some of the respondents quite liked the idea of being named in bank heists! Snippets from my colleagues are as follows:

Martin Hazelton organized an invited session on multivariate smoothing at the 4th Institute of Mathematical Statistics Asia Pacific Rim Meeting (4th IMS-APRM), 27-30 June in Hong Kong and visited University of Leeds, UK, in July. He gave an invited seminar at the Australian National University in October. Martin stood down as NZSA President at the recent AGM.

Rina Parry joined us as a lecturer in Statistics in July 2016. She says, "I'm basically returning to my roots as I received my PhD here in 2013. I have a lovely office with a view and hope to form some research collaborations."

Geoff Jones attended and presented at the Annual Conference of the Royal Statistical Society, held in Manchester in September. Also attending was **Poppy Miller**, a former Massey PN student now doing a PhD with Chris Jewell at Lancaster. Geoff was this year's recipient of the Littlejohn Research Award, presented at the NZSA Conference Dinner in November.

Doug Stirling has been working on getting CAST to be used as a stand-alone Java application. The latest release can be downloaded from http://cast.massey.ac.nz. He is currently recording videos to accompany CAST's advanced e-book about mathematical statistics.

Jonathan Godfrey travelled to UseR!2016 in San Francisco and then on to Europe for his (almost) annual trip to meet others interested in improving the ability of blind students to take STEM subjects at university. He managed to stop off in Turin for a day's visit to discuss his work on his way to Austria. This trip and the trip to Dublin City University were funded by a Royal Society Catalyst Fund grant.

School of Engineering, Computer and Mathematical Sciences, AUT

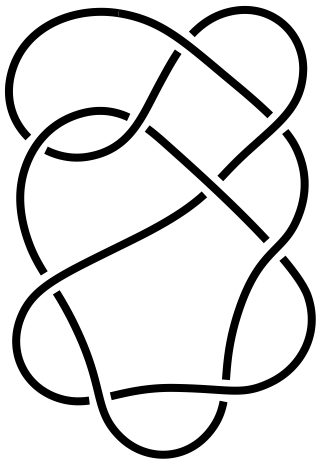
by KATE LEE

The 2016 Joint NZSA+ORSNZ Conference was hosted by AUT from 27th-30th November. In total 206 delegates participated and there were 5 plenary sessions and 115 contributed presentations. Additionally two post-conference workshops on data visualisation (by Prof Diane Cook, Monash University) and Health Analytics Workshop were held. In our school, **Sarah Marshall** was a co-chair and worked very hard with **Priya Parmar** (co-chair), the local organising committee, programme committee and industry sponsors. As a result the Conference was enjoyable and provided an excellent networking opportunity for academics and practitioners.

The 3rd AUT Mathematical Sciences Symposium was held 1-2 December immediately after the NZSA+ORSNZ Conference. Each year we invite a number of speakers with the aim that they gain an opportunity to learn something of the research being undertaken within the Department of Mathematical Sciences at AUT and that hopefully collaborative research activity with some of the academic staff within the Department may eventuate. There were 6 invited talks and 20 contributed talks. Invited speakers this year included **Jeff Hunter** (celebrating his nearly ten years at AUT); **Mark J. McGuinness**, Victoria University of Wellington; **Geoff McLachlan**, University of Queensland; **Tak Kuen (Ken) Siu**, Macquarie University; **Rhema Vaithianathan**, AUT; and **Graeme Wake**, Massey University. See more details at http://www.aut.ac.nz/study-at-aut/study-areas/engineering,-computer-and-mathematical-sciences/news-and-events/Past-Events/aut-mathematical-sciences-symposium.

Murray Black was invited to the NZ Winter School (Spencer on Byron Hotel in Takapuna) hosted by Deakin University in August and shared his research on using Inquiry-Based designs in order to teach and assess statistics across the workplace, undergraduate university papers and level 3 NCEA statistics. In September Murray was invited to a Postgraduate study camp for ethnic AUT students held at Vaughan Park, Long Bay. He spent this time advising students on designing research projects coupled with probable statistical analyses in their projects across a variety of contexts.

Robin Hankin has been working on computational combinatorics (multivariate polynomials and group theory), and computational aspects of a new two-person zero-sum game. He has published work on computational knot theory. He presented his work at two conferences: the 2016 ORSNZ conference hosted at AUT, and the 2016 useR conference hosted in Stanford, California.



Jeffrey Hunter delivered a paper on "The computation of mean first passage times for Markov chains" at the Royal Statistical Society 2016 International Conference, 5-8 September 2016 (University of Manchester, United Kingdom). At the 2016 AUT Mathematical Symposium, Jeff gave a very special talk about his academic career journey, 1959 - now. His journey is still going strong with colleagues. His talk is available here.

Murray Jorgensen has been working with Dr Lyn Hunt of the University of Waikato to produce an R version for the maximum likelihood fitting of a class of multivariate mixture models to data sets with both continuous and categorical variables.

Department of Statistics, the University of Auckland

by JULIE MIDDLETON

Celebrating George Seber

On October 19, staff got together to celebrate 50 years since **George Seber** published a paper in Biometrika that is now widely regarded as one of the founding papers of capture-recapture methodology. Capture-recapture has grown into a major research discipline, and has been the focus of over 8,500 articles, as indexed by Web of Science, since George's ground-breaking paper. A special issue of Statistical Science (2016) commemorates the 50th anniversary, including an interview with George Seber which outlines his life and work – and what makes the famous Seber brain tick ("I need counselling for my compulsive writing"). See also article earlier in this newsletter.

New Postdocs

Dr Irene Zeng, who did her PhD in experimental design and analysis for proteomics with the Department, has just started in a post-doctoral role with Prof Thomas Lumley, who was her PhD supervisor. As Thomas puts it, "I've been working in genomics for years, but only with DNA data. I thought it would be useful and interesting to learn more about all the other sorts of high-dimensional biological measurements that are available now, and think about how to analyse the data. I applied for a grant for us to work together on how to analyse the effects of other measurements on the intermediate steps of gene expression and protein abundance, and through to more familiar biological characteristics. As part of the project, we plan to produce software and to work with other Auckland researchers to plan future experiments." The role is funded by a Faculty Research Development Funding grant.

Dr Binyamin Oz from Israel started a three-year position as a Postdoctoral Research Fellow, working with Prof Ilze Ziedins, in July. He gained his PhD on the topic Strategic behaviour in queues, from the Department of Statistics and the Federmann Center for the Study of Rationality at the Hebrew University of Jerusalem.

Student successes

Chanadta Somchit and **Yu (Jackie) Liu** have successfully defended their PhD theses. **Daisy Shepherd** was awarded second prize in the UoA Faculty of Science Postgraduate Poster Competition in September. This is the second year in a row that a Statistics PhD student has landed a prize in the competition. **Alex Stuteley** presented at the Australasian Vital Statistics Interest Group Workshop on November 22, just days after presenting his honours dissertation. He and supervisor, Andrew Sporle, have created a tool, currently in live beta format, that can be used by anybody to calculate, compare and graph age-standardised rates using existing microdata or count data.

Statistics Teachers' Day

The theme for this year's Statistics Teachers' Day, held on November 25 at the Epsom campus, was "Data, data, everywhere." More than 300 teachers attended to be inspired and find out about their peers' tips and tricks to engage students in statistical thinking.

The plenary speaker was **Di Cook**, Professor of Business Analytics in the Department of Econometrics and Business Statistics at Monash University, Australia. Prof Cook talked about the role of open data, open source software and data visualisation in developing "quantitative citizenship". As she says, "In this technological age we are drowning in data. Good data visualisation helps us to swim, digest the data, and learn about our world."

Statistics graduates return for Alumni Showcase

What did statistics have to do with this year's spectacular discovery of gravitational waves? How does statistics help us eradicate pests like possums, rats and stoats? And how can you wrangle a representative sample out of social networks?

These were just three of the questions posed – and answered – by Department of Statistics academics who presented their research at the first

joint Alumni Showcase, a collaboration by the Statistics, Mathematics and Computer Science departments. It took place on Saturday 15 October in the new Science building at the University's City Campus. The day aimed to strengthen links with graduates by presenting seven short talks on current research, information stands, guided tours of the computer history museum, and a lunch over which graduates had the opportunity to renew relationships with their former lecturers and forge new connections.

Read full story here, and enjoy photos from the day on the Department of Statistics Facebook page.

Documenting the impact of hunting in the Amazon

Just how much damage did hunting for hides do to wild animal populations in the Brazilian Amazon in the 20th century? Conservation expert **Associate Professor Rachel Fewster** is one of a team that has used previously unpublished shipping records about wild animal hide exports from the region to estimate how hunting affected animal population survival rates.

The team's research was published in mid-October in the open-access journal Science Advances, and concludes that water-dwellers like giant river otters, black caiman and manatees suffered population collapse and local extinction. In contrast, land animals, including collared peccaries, deer and even jaguars, lived in areas less accessible to hunters. This helped their populations remain resilient, even when the international fashion trade was demanding hides in the 1930s and 1940s and again in the 1960s.

Read the full story here.

Protecting indigenous data

Senior research fellow **Andrew Sporle** was among Māori academics who represented New Zealand at the first international meeting to focus on indigenous control of data about native peoples.

Mr Sporle (Rangitāne, Ngāti Apa, Te Rārawa) joined three other Māori researchers at the Indigenous Open Data Summit on October 5 in Madrid, Spain. The summit provided a forum to discuss what action was being taken to protect the use of data about indigenous peoples. It preceded the 4th Annual International Open Data Conference (IODC) in the city on October 6 and 7.

Mr Sporle says that indigenous data sovereignty is the right of a native people to govern the collection, ownership and application of its own data, and derives from tribes' inherent right to govern their people, lands and resources.

In a world of open data, he adds, indigenous peoples are becoming increasingly concerned about who owns and represents statistics about indigenous people, who has access to the data, its cultural integrity, and how people's privacy and autonomy is protected. Read the full story here.

Rapid eradication assessment tool developed

Researchers from the University of Auckland Department of Statistics and School of Biological Sciences have developed a new online tool for rapidly confirming when pests have been successfully eradicated from an area, in association with Landcare Research and Mexican partners GECI (Grupo de Ecología y Conservación de Islas). Users input basic population dynamic parameters for the pest species, such as how far individuals can move, how likely they are to be detected, and what level of effort will be put in to monitoring. The software calculates how likely it is pests have been eradicated from the area if none are detected.

Study collaborator **Dr James Russell** says, "With new bold visions to eradicate introduced predators from the entirety of New Zealand by 2050, and all of its offshore islands along the way, managers need cutting-edge scientific tools to enable them to confirm eradication as quickly as possible so they can move on to the next project".

Read the full story here.

R - the ultimate virus

R will be no stranger to anyone reading this - but did you know that its creators thought, way back in the beginning, that it would never be used outside the University of Auckland? There's an entertaining story about R's very modest beginnings here.

Visitors

Barbara McKnight, Professor of Biostatistics at the University of Washington, Seattle is visiting. Her research interests include statistical methods in animal carcinogenicity testing, epidemiology, and genetic epidemiology, and she has collaborated on studies of diabetes, cancer, traumatic injury and cardiovascular disease.

Sander Greenland, Professor of Epidemiology and Statistics at the University of California, Los Angeles, visited in September, thanks to a Distinguished Visitor Award obtained by Andrew Sporle and Thomas Lumley.