



The New Zealand Statistical Association Newsletter

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Welcome

by VANESSA CAVE

An important activity of our association are the annual conferences, this year being hosted by the University of Otago, Te Whare Wānanga o Otāgo, in Dunedin (<http://www.otago.ac.nz/nzsa>). In addition to sharing statistical knowledge, our conferences provide a wonderful opportunity to interact, build collaborations and make lifelong friendships with fellow New Zealand statisticians in both academia and industry. They are also a great way of introducing and welcoming students, early-career statisticians and expats into the New Zealand statistical community. ***So, please do encourage students and “newbies” in your organisation/network to join us in Dunedin.***

Dunedin is a special place for me - it's where I first discovered the delights of applied statistics (through undergraduate study at the University of Otago and my first job at AgResearch Invermay) and the Dunedin 2005 conference is where my journey with the NZSA began. It is also where I met and enjoyed the teachings of Peter Johnstone and John Harraway, both of whom are soon entering retirement having tried and failed multiple times already! A terrific article on John, “[Retirement after 54 years - on the third go](#)”, was recently published in the Otago Daily Times, and you can read about Peter's path to retirement on [page 13](#).



Finally, I'll leave you with a fun wee problem posed by a budding young statistician, my 6 year-old nephew Spencer:

I have a stats question Spencer has asked based on Mini Shoppers from the supermarket. There are 30 of these objects. Each time you spend a certain amount (\$30) you get one at random. How much would you expect to spend before you had all 30 of them?

I hope to see many of you in Dunedin at the 70th NZSA conference.

Ngā mihi,
Vanessa

Editorial

by MARIE FITCH

Kia ora koutou,

This newsletter has ended up being published a bit later than I would have liked as 'life' has got in the way. The nice thing in all of that has been that our grandchild count has increased by one to five and now includes a grandson!

Reading each contribution to this newsletter as it arrived has been a treat. There is so much happening across the country in Statistics and what is included here is just a snapshot of some the diverse and interesting things occurring. It can often be difficult to coax information out of colleagues so I am always grateful for the time and effort put in by our correspondents. It is they that ensure that we get a worthwhile read. If a report on your corner of the NZ statistics world is missing do contact me and volunteer to write about it for future newsletters!

As always other contributions and/or suggestions are always welcome. The next newsletter is planned for January 2020.

Ngā mihi,

Marie



Conferences



New Zealand Statistical Association Conference 26-28 November 2019, University of Otago, Dunedin, New Zealand

by TILMAN DAVIES (CHAIR, NZSA2019 ORGANISING COMMITTEE)

We are delighted to announce the upcoming New Zealand Statistical Association Conference (NZSA2019), hosted by the University of Otago at our Dunedin campus and taking place during Otago's 150th anniversary year. The main conference activities will take place from Tuesday, 26 November to Thursday 28 November, with an evening welcome session on Monday, 25 November for those who arrive early.

We welcome all academic and industry statisticians, data analysts and practitioners to join us for this event. Four talented keynote speakers have been confirmed: Prof **Adrian Baddeley** (Curtin University); Prof **Martin Hazelton** (Massey University/University of Otago); A/Prof **Barbara Holland** (University of Tasmania); and A/Prof **Ivy Liu** (Victoria University of Wellington). Our aim is to celebrate

statistics of all flavours, in particular the growing student body at both undergraduate and graduate levels. *Harmonic Analytics* once more returns to generously sponsor student prizes at the event, and the NZSA sponsors travel subsidies for eligible student attendees.

In addition to encouraging submission of contributed talks, we hope to schedule a formal poster presentation session given sufficient interest. This is a particularly good option for practicing statisticians and students alike, providing wall-art for decades to come!

The conference website is now live. Registration and abstract submission is open; costs, important dates and other relevant information can be found at www.otago.ac.nz/nzsa. For any queries, please email nzsa2019@otago.ac.nz.

Looking forward to seeing you all down here!

Statistics in Ecology and Environmental Monitoring Conference, 2-4 December, Victoria University of Wellington, New Zealand

by DR NOKUTHABA SIBANDA (CHAIR, SEEM 2019 ORGANISING COMMITTEE)

We are pleased to announce the upcoming Statistics in Ecology and Environmental Monitoring (SEEM) 2019 Conference, to be hosted by Victoria University of Wellington from Monday 2 to Wednesday 4 December in the beautiful city of Wellington!

We welcome anyone with an interest in the application and development of statistical methods for ecological, conservation and environmental monitoring applications, including researchers (industry or academic), practitioners and students.

We have an exciting line up of plenary speakers for the main part of the conference; namely A/Prof **Rachel Fewster** (University of Auckland), A/Prof **Res Altwegg** (University of Cape Town), Dr **Nick Golding** (University of Melbourne), Professor **Shirley Pledger** (Victoria University of Wellington), Dr **Jim Thorson** (Alaska Fisheries Science Center, NOAA).

Other highlights are:

- A Special Issue of the Environmental and Ecological Statistics journal. Manuscripts derived from conference presentations (oral or poster) will be considered for

publication in this special issue of the journal. All submissions will be considered, but we especially welcome articles on the application of statistical methods to data from New Zealand or Australia.

- A special half-day session headlined by the Parliamentary Commissioner for the Environment, Mr **Simon Upton**, who will talk about progress under New Zealand's Environmental Reporting Act. There'll also be a plenary talk by **Graham McBride** (NIWA).
- A poster session scheduled for the evening of Monday 2 December. Please indicate on the abstract submission page if you are interested in giving a poster presentation.

Abstract submission and registration are now open. For information, please visit the conference website:

<http://sms.victoria.ac.nz/Events/SEEM2019/>.

For any queries, contact

nokuthaba.sibanda@vuw.ac.nz.

We look forward to welcoming you to Wellington!

Stories of interest

Meet the NZSA Executive

In this column each newsletter, some of the current NZSA executive introduce themselves. The brief they have been given is to provide a photograph and a paragraph answering some or all of the following three questions.

- What is your current role on the NZSA executive? How long have you been doing it? What (if any) other roles have you had?
- What is your job/connection to the NZ statistics community?
- What do you enjoy doing outside of work?

Alasdair Noble

Currently I am Chair of the Education Committee and the link between that committee and the Executive. I also look after administration of the prizes for the Science and Technology fairs that are sponsored jointly by NZSA and Stats NZ. I have been carrying out these roles for far too long. I was originally brought on to Exec as Secretary in 2002 when Steve Haslett became President. At that time it was the norm for the President and Secretary to be from the same institution and for some unknown reason Steve thought I could be Secretary. After the two year term I remained on Exec and then became the Education Committee representative which has continued.

In my professional life I am a senior statistician at AgResearch in Lincoln. I was previously a senior lecturer at Massey University in Palmerston North and we moved to Christchurch a month before the February earthquake in January 2011. I had been working with Mark Bebbington at Massey and I confidently told my wife that the big earthquake had happened the previous September, the aftershocks were now following the expected distribution and all would be ok!

(Note I am not blaming Mark for this error.)

Outside of work I try to get into the outdoors when I can which could be a walk or bike ride in the Port hills or more challenging trips. However family ties do prevent me from taking advantage of this as much as I would like. I am also involved in disability issues chairing Disabled Snowsports Canterbury (if anyone wants cheap skiing at many fields in the South Island check out our bargain books [here](#) !!).



Catherine MacKenzie

I have been the webmaster for the NZSA website since 2016, following a year of sharing the role with Vanessa Cave. Previously I was the Young Statisticians representative in 2012. I try to keep the website updated with relevant news and events for the statistics community in New Zealand, so let me know if there is something that you would like to have posted on the website. The website is also an archive for documents pertaining to the NZSA from years gone by.

I am working as a Biometrician at Plant and Food Research in Te Puke in the Bay of Plenty, so my work primarily involves the design and

analysis of experimental trials involving kiwifruit and avocados and the insects that like to live on these fruit. A perk of the job is the availability of free kiwifruit and avocados!

In my spare time I like to spend time with friends and family, and pottering around in the garden.



Richard Penny

I am currently the corporate representative on the NZSA Executive and have been for some years. In my 35 years' association with NZSA I have at various times been secretary, Newsletter editor, exec member, twice conference programme chair and twice conference chair.

I have worked at Stats NZ for my entire statistical career and am now a Principal Analyst, but also do teaching at the University of Canterbury.

Probably due to my one claim to statistical fame – I have met R A Fisher – I think about statistics even when not being paid for it, but also enjoy all forms of the arts and walking.



Updates

Student & Early Career Statisticians Network

by LISA THOMASEN



Ihaka Lecture Screening

Screenings were organised again this year by some of our student and early career team in Palmerston North, Christchurch and Dunedin. NZSA provided funding for drinks and nibbles. We are keen to see these screenings continue happening in the coming years. Thanks to everyone who attended or helped organise these.

Wellington Rep

We currently have a vacancy for a rep in Wellington. The role involves being a point of contact for students and professionals in the Wellington region and taking the lead on organising a networking event or two throughout the year. If anyone is interested or would like to

find out more, please get in touch.

Amanda Hughes has recently stepped down from her role as the Wellington Student & Early Career rep. I would like to acknowledge Amanda's time and effort over the past few years, especially her role in the setup and ongoing administration of the group Facebook page.

November Event

The networking event at this year's conference in Dunedin will be held on the evening of Tuesday 26 November. More details to come closer to the time.

Find us on Facebook!

If you'd like to stay up to date with what's happening, follow our **Facebook** page.

News from the Statistics Education Teams

Statistics Education News

by MAXINE PFANNKUCH



Launch of new online journal for New Zealand teachers in October 2019

Data and Modelling in Teaching (DMT) is a new online journal set up for teachers. It will have peer-reviewed lesson plans for teachers at all levels, early childhood to graduate. Led by **Anna Fergusson** and **Maxine Pfannkuch** (University of Auckland), in conjunction with members of the NZSA Education Committee, the journal aims to improve the quality of teaching resources and the designing of tasks. Task design has a critical influence on students' reasoning processes, what they learn, and on how they experience and understand the nature of statistical activity and thinking. Four lesson plans have already been submitted and reviewed. We hope to have seven lesson plans ready for the inaugural issue of DMT.

International Data Science in School Project

The International Data Science for Schools Project (IDSSP) is an international collaborative activity to develop a curriculum framework for Data Science for the last two years of high school, and to develop a parallel framework to teach teachers how to teach such a course. See www.idssp.org for details of the project, including the people and organizations involved. Note that **Chris Wild** (University of Auckland) is a spokesperson for the group and the NZ representative along with **Anna Fergusson** and **Michelle Dalrymple** (Cashmere High School). Public comment has been invited

on the draft frameworks and material, which are available [here](#). The final version of the project materials will be made available freely, in August or September 2019.

CensusAtSchool Project

The 2019 CensusAtSchool survey has been running since 4 March. So far there have been 21,300 student-responses from the classes of 771 teachers from 427 schools. Over 30,000 responses are expected for the year. New in 2019 are questions about behaviour and feelings around social media and cell phone use/deprivation, the ways the students approach social interaction problems and, for Years 11-13 only, how their friends and parents feel about drug and alcohol use. Media exposure to date includes interviews of **Rachel Cunliffe** on the AM Show, Newshub headline news, Newstalk, and Radio 531pi. There have been four teacher registrations from the Cook Islands (facilitated by **Derek Smith**) and a school in Bangkok has participated. These responses do not go into the New Zealand database. **Chris Wild** and Rachel Cunliffe are Co-Directors of the Project and **Atakohu Middleton** writes press releases. **Anne Patel** is responsible for the teaching resources on the website. See: www.censusatschool.org.nz

US Conference on Teaching Statistics (USCOTS) was held 16-18 May 2019 at State College, PA. Presentations and posters from the conference are now available at: <https://www.causeweb.org/cause/uscots/uscots19> including videos of the keynote addresses by **Jane Watson, Ron Wasserstein and Allen Schirm, John Kruschke, and Kari Lock Morgan.** Documents are posted from the breakout sessions, including topics such as simulation-based inference, Github, and data science.

The 11th International Research Forum on Statistical Reasoning, Thinking and Literacy will be held 14–20 July 2019 in Los Angeles, USA. **Maxine, Anne Patel and Anna Fergusson** (University of Auckland) are participating. The theme of the Forum is New ways of interacting with data, context and chance in statistical modelling processes (see <http://srtl.info>).

International Association for Statistical Education (IASE) Satellite Conference, Kuala Lumpur, Malaysia, 13-16 August 2019. **Stephanie Budgett** is the Proceedings Editor

for the Satellite conference as part of her role as Vice-President on the IASE Executive Committee. **Stephanie, Malia Puloka and Amy Renelle** (University of Auckland) are presenting papers. See IASE website for further information: <http://iase-web.org/conference/satellite19>

Australian Conference on Teaching Statistics (OZCOTS) 9-10 July 2020, Gold Coast, Queensland, Australia. This conference is held as a separate program stream in the joint Statistical Society of Australia and NZSA Conference. The theme for the conference is Statistics education in today's world. Abstracts need to be submitted by 20 December 2019. See: <https://anzsc2020.com.au>

The 14th International Congress on Mathematical Education, Shanghai, China, 12-19 July 2020. IASE runs two special topic groups, one on statistics, the other on probability. The deadline for submission of papers is 15 September 2019. See: <https://www.icme14.org/static/en/index.html>.



NCEA Change Package 2019

The Ministry of Education released its *NCEA Change Package 2019 Overview* in May: You'll find it at <https://conversation.education.govt.nz/conversations/ncea-review/change-package/>. The Ministry spent much of 2018 collecting ideas, advice and feedback from teachers and other stakeholders. They got several lots from us. (NCEA is the set of three National Certificates in Educational Achievement, that students work towards, usually in their last three years of secondary school.)

We agree with the Ministry that NCEA is basically sound, but needs some improvements. The *Overview* has seven sets of proposed changes. We are really keen to have input on at least three of these:

- Strengthen literacy and numeracy requirements. Statistics already has some role in numeracy requirements, and we want to make sure that the future requirements are fit for the statistical literacy needed for the 21st century world.
- Have larger, fewer standards. The proposal is that each subject or field of study per year has four fairly large achievement standards, with credits adding to about 20. Our subject, Mathematics and Statistics, has evolved to have lots of smaller achievement standards, with credits adding to more than 20. This gives schools and students plenty of flexibility in designing courses that meet the different aptitudes and desired futures of students. It enables schools to balance the Mathematics and the Statistics. We want to make sure that the positives

of flexibility continue, and we look forward to working with other maths and stats education groups.

- Show clearer pathways to further education and employment. We see statistics education as important in a variety of pathways.

We have access to the huge knowledge base that exists for statistical education. We are keen to make sure that we can make it available to NZ decision-makers, whenever there are changes in assessment, as in this review, or in curriculum, as may happen in coming years. We are keen to make sure that the knowledge base is available to the teaching community as well.

The Ministry's review was framed by five key principles: *wellbeing, inclusion and equity, coherence, pathways* and *credibility*. We are interested in these too, including equity. See [here](#), and the cabinet paper [here](#).

Other issues

Our area has plenty of other issues. We are also interested in:

Ongoing contact with Ministry and NZQA staff. Lauren Burr (Ministry Senior adviser with interest in our area) and John Oldroyd (NZQA manager for digital assessment) spoke to us at our February meeting. We look forward to talking with them and colleagues further.

Digital assessment, as in digital online exams. NZQA is carefully moving into this, and recognises problems with subjects that require non-standard text, as in algebra. We see the issues for Mathematics and Statistics as a bit different:

Statistics has less algebra, but it has possibilities for thought-provoking use of online datasets, exploration software, and digital entry of student responses.

NCEA exams of November 2018. We eventually produced a Statement on external assessments 2018: see [here](#).

The Networks of Expertise in Mathematics and Statistics. These were set up by NZAMT with funding from the Ministry, and are enabling professional development for teachers by teachers.

Contact with the America Statistical Association / National Council for Teachers of Mathematics Joint Committee (ASA/NCTM). We have members on each other's committees. The ASA/NCTM is working with us on what makes a good statistical task for their and our teaching journals, and on updating their GAISE document. **Anna Fergusson** will be presenting at their Joint Statistical Meeting in August.

NZAMT16 in Hutt City in October this year. The theme is: 'Coming together to celebrate the teaching and learning of Mathematics and Statistics'. The keynote statistical speaker is our member Anna Fergusson. See <https://nzamt16.nz/>.

Poster competitions. **Emma Mawby** has helped to arrange support from Stats NZ for NZ entries to the International Statistical Literacy Project (ISLP) poster competition. NZ entered a poster in each of the two categories for school age students. The team did not seek entries in the undergraduate category, but it could do for the next competition. In the younger category we entered a poster by Daphne Ranta and Elisa Harley from Wadestown School, "Who's the Odd One Out?". In the older category we entered a poster by Jacky Edwards and Trinity Frater from Kerikeri High School, "Tradescantia or native ground cover. Which does the New Zealand native Wetā prefer?" Each entry received a \$250 prize, provided by Stats NZ. Both of these posters originated from Regional Science Fair entries that won prizes provided by NZSA/Stats NZ. Ideas for alternative sponsors would be very welcome.

The International Data Science in Schools Project (IDSSP). Several members are involved in this international collaborative project:

<http://www.idssp.org/pages/purpose.html>.

DMT. Work continues towards our online teaching journal: Data And Modelling In Teaching.

Datasets. We hope to make it easier for teachers to access NZ datasets on interesting issues.

The committee

We'd like to share news about several further members.

We welcome a new member: **Rebecca Pollitt** of Otago Girls College. We look forward to input from her first-hand teaching practice.

John Harraway is retiring from the committee. At this momentous event, we wish to highlight John's huge and ongoing energy for statistical education. He's been a mover on the international scene, as president of IASE, and organiser of many conference events. He's contributed plenty to the NZ scene, as in the data-rich videos from his colleagues at Otago (<http://www.maths.otago.ac.nz/video/statistics/>). He has supported and encouraged the statistical teachers of Otago district. Now he is organising a session on Data Science at the WSC in Kuala Lumpur, and is chairing another. He is on the international jury for the ISLP Poster Competitions. Keep it up, John! And best wishes for the future.

Pip Arnold has been awarded the 2018 Beeby award. The biennial Beeby Award 'supports development of an innovative learning resource based on high quality research'. From the NZCER site: "The 2018 Beeby Award ([see here](#)) has been awarded to mathematics and statistics educator Dr Pip Arnold. Dr Arnold's winning proposal is for a resource to support statistics teaching and learning in the New Zealand Curriculum and Te Marautanga o Aotearoa."

We are pleased to have two members as Kaiarahi of the Networks of Expertise in *Mathematics and Statistics*: **Derek Smith** for the nation-wide role, and **Robyn Headifen** for the Auckland role.

Local News

Statistics at ...

AgResearch Statistics Group

by MARYANN STAINCLIFFE



Last year both **Esther Meenken** and **Maryann Staincliffe** took maternity leave to care for the youngest members of the statistics team. Matthew Staincliffe, born 13 August 2018, now 11 months old, experienced his first statistics conference in December, has attended a few team meetings and can regularly be seen exploring the statistics corridor. He has started at a local preschool two mornings a week allowing Maryann to return to work part time. Hanna Muir, born 11 October 2018, is now almost 9 months old and growing into a wonderful and bold little girl. She spends two afternoons a week with her dad allowing Esther to return to part time work.



Matthew aged 10 months checking the letter box.

Peter Johnstone “re-retired” from AgResearch at the end of June 2019. (His last attempt to retire was interrupted when he was asked to cover team movements and maternity leave.) Peter joined the Ministry of Agriculture and Fisheries in January 1973, to work alongside **Geoff Jowett** at the Invermay Research Centre. He has been there ever since, apart from a few short breaks, mainly to travel to some remote corner of the world to pursue climbing or statistical interests, transitioning to AgResearch with the establishment of Crown Research Institutes. Peter became leader of the Invermay biometrics group from late 1982 and managed various groupings both locally and nationally within the organisation until his official retirement in June 2007. This included being leader of all AgResearch statisticians, following a reorganisation in July 1999. One year later this group was expanded to include the newly established bioinformatics team. After a three-month hiatus, Peter re-joined the Invermay team on a part-time basis in October 2007.

Peter has a strong interest in experimental design, authoring the book “How to plan an experiment” in 1994 as well as having several publications on various aspects of experimental design. This interest also led to his involvement with animal ethics committees, ensuring that experiments

were designed to meet the research objectives. Peter's many collaborators have benefited from his clarity of thought and no-nonsense approach to statistical analysis, such as that shown in the NZ Society of Animal Production 1979 conference paper entitled "A statistical appraisal of a sacred cow". Peter was awarded Honorary

Life Membership of the NZ Statistical Association in 2013. We acknowledge Peter's many contributions to our team, our company and to New Zealand science and wish him the very best in his retirement. However, we have kept Peter's office for him and hope to still see him around Invermay.

AUT: Department of Biostatistics and Epidemiology

by ALAIN VANDAL



The Department of Biostatistics and Epidemiology (DoBE) at AUT has welcomed two new members since the last newsletter, Research Fellows **Melanie Moylan** and **Takayoshi (Tak) Ikeda**. Melanie is seconded part-time to the Pacific Islands Families Study, while Tak is seconded part-time to the National Institute of Stroke and Neuroepidemiology (NISAN). DoBE is expecting the return of Research Officer **Stéphane Janicot**, who returned home to France for a spell, around the middle of July.

Head of Department **Nick Garrett** is deeply involved in gambling and addictions research, and attended as a presenter the Think Tank on Gambling Research, Policy and Practice, recently held in Melbourne. Following on from the Global Burden of Disease (GBD) Brain Summit held at AUT last November, **Priya Parmar** was nominated for, and received extensive training in GBD analytical methodologies from the Institute for Health Metrics and Evaluation (University of Washington) earlier this year. She is now working as part of their Years Lived with Disability team to analyse neurological outcomes, with the aim to develop a future satellite centre of GBD expertise at AUT (a first for NZ, and only the second

satellite expertise site outside of USA).

DoBE has developed expertise in wrangling and analysing virtual cohorts formed from Stats NZ's Integrated Data Infrastructure (**IDI**). **Ben Elliott** and **Brice Valentin Kok Shun** have both undertaken the analysis of complex projects made possible by this unparalleled New Zealand data resource.

Major projects on which DoBE members are key named investigators include the NSC-funded PREVENTS study, a randomised controlled trial (RCT) of health and wellness coaching nearing final data lock steered by NISAN; the Ministry of Health (MoH)-funded Effectiveness of a Face-to-Face Intervention for Problem Gambling RCT, steered by the Gambling and Addictions Research Centre (GARC); continued work on GARC's National Gambling Survey, funded by MoH; the MBIE-funded Harmonised study, a Māori-centred project including a stepped wedge trial of a private social platform app promoting healthy relationships amongst taitamariki; and HRC-funded hearing and respiratory studies from PIFS. DoBE also forms a consortium with Ko Awatea at Counties Manukau Health to analyse New Zealand Health Survey data.



At the beginning of this year, we welcomed two new lecturers:



Dr **Victor Miranda-Soberanis** (Lecturer in Analytics and Statistics) is a computational statistician who pursued a PhD in Statistics from University of Auckland (2014-2019). Prior to that, he obtained an MSc in Mathematics from the National Autonomous University of Mexico (2008) and a BSc in Mathematics from the University of Yucatan, Mexico. At present, his research concentrates on two lines: a) generalized regression using vector generalized linear and additive models (VGLMs/VGAMs), and b) modelling and estimation of time series, and forecasting methods using VGLMs. Before joining AUT, Victor worked as a Graduate Teaching Assistant at the Department of Statistics, University of Auckland and as the course leader for “Business Analytics” in the Master of Analytics programme at the University of Auckland Business School.



Dr **Michael Lockyer** (Lecturer in Mathematical Sciences) completed a PhD with specialisation in Mathematics in 2015 at the University of Auckland, and was a temporary lecturer in the Mathematics Department at the University of Auckland during 2017 and 2018. Michael’s research interests include topological dynamics, and he is looking forward to developing this background into a more applied area of research. Prior to studying mathematics, Michael worked as an engineer for several years both in New Zealand and overseas. Michael will initially be involved with developing and teaching Engineering Mathematics papers at AUT.

Murray Jorgensen has at last finished his re-write of the Multimix program in R. Multimix (Hunt & Jorgensen, ANZJS 41(2), 1999, 153–171) is a mixture model-based clustering program for multivariate data with both continuous and categorical variables. He now needs to convert this to a package in R but is happy to supply the present version to anyone interested.



Sarah Marshall attended the 11th International Conference on Mathematical Methods in Reliability from 3rd – 7th June in Hong Kong. The conference was hosted by City University of Hong Kong. She presented a paper entitled “Geometric-Like Processes: An Overview and Some Applications”.



AUT: School of Sport and Recreation

by ROBERT BOROTKANICS



Auckland University of Technology’s School of Sport and Recreation enjoys an internationally recognized high ranking, with QS and AWRU top 50 ratings. This high ranking is good, but like all things competitive, one can always do better. Early in 2019, the AUT leadership recognized the need to improve the quantitative aspects of its professional research and postgraduate research training, and decided to make more deliberate investments in these areas. They therefore formalized an increased commitment with dedicated academic staff in statistics and engineering.

Dr **Robert Borotkanics** was given primary responsibilities, providing biostatistics support to numerous research programs. He also continues to formalize an apprentice-based

statistics training program into the School’s postgraduate research training. This school has a large postgraduate training program that attracts research trainees from around the world. Much of this research is carried out at AUT Millennium, where the overriding research mission is to help New Zealanders live longer and healthier lives and to enjoy and excel in sport. This program was the result of pilots carried out in 2018, which showed promise. For instance, recent doctoral graduates, Dr **Chloe McKenzie** and Dr **Shohn Wormgoor**, whose results came from mixed models analyses, each published important sports performance and health findings in the peer reviewed literature. These articles are: McKenzie, C.R., Whatman, C., Brughelli, M. and Borotkanics, R., 2019. *The effect of the NetballSmart Dynamic Warm-up on physical performance in youth netball*

players. Physical Therapy in Sport; Wormgoor, S.G., Dalleck, L., Zinn, C., Borotkanics, R. and Harris, N., 2018. *High-intensity Interval Training is Equivalent to Moderate-intensity Continuous Training for Short-and Medium-term Outcomes of Macro-and Microvascular Complication Markers in Men with Type 2 Diabetes*. *Frontiers in Endocrinology*, 9, p.475.

Dr **Jono Neville**'s responsibilities in sports technology assessment have focused on developing collaboration between the school of Sport and Recreation and the school of Engineering Computer and Mathematical Sciences. Building this collaboration has enabled the combination of engineering skill sets including methodological design, technology integration, and data processing with Sport and Recreation skills including application driven research and project commercialisation. This collaboration has

been formalised as the Sports Technology Centre which has seen over twenty journal publications since its creation in 2017.

Data collection for the 'High intensity interval training and mental health in adolescents' was completed, along with analysis of primary outcomes. This study, funded by the Cure Kids A Better Start National Science Challenge (MBIE) evaluated an embedded high intensity interval training program into existing physical education programs, evaluating physical and psychosocial metrics. The Principal Investigator A/Dean **Nigel Harris** and Lead Statistician Dr **Robert Borotkanics** have provided initial findings to the funder, along with a presentation at the International Society of Behavioural Nutrition and Physical Activity annual conference in Prague. Publications are forthcoming.

Department of Conservation

by HELENE THYGESEN



During the last year, the statisticians at Department of Conservation have put a lot of effort into improving the visitor counter estimates. This is challenging because of spurious zeroes (zero-counts that can't reliably be distinguished from missing data).

We have also introduced GAM models to deal with

spatial variation in animal population densities, and improved our estimates of national animal population trends, as we now have repeated measurements in 1/5 of the conservation area. (We started with most of the measurements in 2013 and work with a 5-year cycle.) This allows us to introduce random effects so we can get a picture of local colonization and extinction rates.



The Stats group at Massey in Palmerston North has spent quite a lot of energy during the first half of 2019 working out plans for the re-vamped BSc degree, and trying our best to understand how the new set of papers can possibly help our workloads.

Jonathan Marshall, Geoff Jones, Debbie Leader, Anne Lawrence and Rina Parry were chuffed about winning a Vice-Chancellor's Teaching Excellence Award. Apparently this means that they have demonstrated outstanding, high quality and innovative approaches in their teaching and learning practice. Good timing given the aforementioned new BSc.

Sarah Pirikahu successfully defended her PhD thesis "Statistical Inference for Population Based Measures of Risk Reduction" at her Oral Exam in May, and has passed subject to emendations. Her supervisors were **Geoff Jones, Martin Hazelton** and **Cord Heuer** (Epicentre).

Alison Livingston (formerly Sefton), supervised by **Steve Haslett** and **Geoff Jones**, has also passed her PhD subject to emendations, after defending her thesis "Some Diagnostic Techniques for Small Area Estimation, with Applications to Poverty Mapping".

Martin and wife Niki welcomed the arrival of Samuel Hazelton on 12 February 2019. Relatives have been sending knitted babywear in large quantities, seemingly concerned about the effect of Dunedin temperatures on the wee fellow come the family's move south in September. Of course, compared to his own childhood in the north east of England, Martin claims that Otago is virtually the Riviera.



Looking ahead to spring (obviously, no one moves to Dunedin in winter!), Massey's loss will definitely be Otago's gain when the professorial transfer market opens: After 15 years, **Martin Hazelton** will take himself and new family to a less administratively overloaded position at the University of Otago. **Mark Bebbington**, whom Martin superseded as Head of Statistics on his arrival (no, Mark wasn't broken up about it ...), and who replaced Martin 'temporarily' when Martin was elevated to the realms of university management-elite, is bemused (that's the word he used for the record) at the turn his pleasant research and teaching oriented life has taken. Even the half of Mark that works for volcanology is feeling a little stretched. Martin's research and teaching (but not, alas, his administrative) functions will fall to our new appointment, Dr **Xun (Shaun) Xiao**. Xun comes to us from a PhD at Hong Kong with Professor **Min Xie**, courtesy of **Chin-Diew Lai's** connections. Of course, Xun has been at Massey for the last 2.5 years covering for Martin, so he must be doing something right.



The last six months have been busy ones, the business is growing in staff as is the number of clients we are working with. **Kylie Reiri** has been promoted to CEO and we have also recently welcomed **John Park** and **Pip Bennett** on board as Data Scientists. We are active on LinkedIn, follow us for weekly updates.

Recent projects:

We have continued our relationship with ACC after the claims system went live last year. We can report, after a couple of team members had minor injury accidents recently, that the automated decision making and text system is working well.

We have been busy teaching the official SAS analytics courses and helping SAS roll out new products across several government agencies. We have also completed research and insight based projects using the Integrated Data Infrastructure (IDI) for the Vodafone Foundation, the Tertiary Education Commission and the Health Promotion Agency. We are active members of the analytics and data science community in Wellington in particular and are working with agencies to build best practice guidelines and standards related to ethics and also coding. We also have several interesting projects in the works so watch this space as we are able to share more about these.

Plant and Food Research



Harris Lin has started with us at our Mt Albert site. He was previously at University of Waikato, where he was a research fellow with

the cyber security group. He is now working on an 'electronic nose' project, and several image recognition projects.

Stats NZ

Quarterly Employment Survey

by WENDY DOBSON



Stats NZ are redeveloping the Quarterly Employment Survey (QES). The intention is to extend Stats NZ's administrative data-first approach, established across Stats NZ's economic collections, to the QES, and improve coherence across Stats NZ's suite of economic statistics. This will result in reduced respondent burden and better quality data. This proposal integrates QES data collection and processing within the existing Business Data Collection (BDC) for sub-annual financial statistics. It collects the QES online, integrates the processing of survey and administrative data, and stores financial and labour market data in the same analytical environment.

You can find out more about our multi-year journey to redevelop sub-annual economic statistics in these papers:

https://www.nzae.org.nz/wp-content/uploads/2015/01/NZAE_GST_paper_2014_Final_COX.pdf

https://ww2.amstat.org/meetings/ices/2016/proceedings/113_ices15Final00253.pdf



*Mat Page and Chen Chen,
two of the main contributors to this work*

Statistical Methods and other news

by RICHARD PENNY



Recently we had several people from SM and elsewhere in Stats NZ presenting at the Population Association of NZ (PANZ) conference in Wellington. **Abbey Morgan** went to the International Total Survey Error Workshop (ITSEW) in Bergamo, Italy and visited our UK colleagues at the ONS afterwards. Coming up, **Vince Galvin**, **Chen Chen** and **Anna Lin** are presenting at the World Statistical Congress (run by ISI) in Kuala Lumpur.



Interesting happenings

Autumn graduation day for the Faculty of Science saw around 100 students from Statistics in the ceremonies, including two PhDs (**Niffe Hermansson** and **Victor Miranda-Soberanis**) and 15 Masters students.

Kids count: CensusAtSchool / TautarangaKiTeKura is back! The biennial statistical literacy project, run by the Department of Statistics on behalf of the Ministry of Education and Stats NZ, launched on Monday March 4. We'll hear loud and clear the voices of Kiwi kids on issues as wide-ranging as climate change, the amount of time they spend on digital devices, and how they handle interpersonal issues. Details [here](#).

Boosting rangatahi wellbeing: Department of Statistics lecturer **Andrew Sporle** is one of three people leading ambitious research that aims to boost the health and wellbeing of rangatahi Māori – young Māori. Details [here](#)

Preserving species: The Department of Statistics' **James Russell** is part of an international collaboration of scientists, researchers and conservationists that has drawn up a list of 107 islands that could help stem extinctions - and NZ has five islands on the list. "We already know islands are a vital conservation opportunity but this study gives us the bigger picture; a list of locations where the most progress could be made," says James. Details [here](#)

Study-buddy success: **Susan Wingfield** (Ngāti Porou, Ngāti Maniapoto) is in charge of a programme in Statistics that turbo-charges Māori and Pacific students. Since 2004, the Professional Teaching Fellow has been the department's coordinator of Tuākana, a type of buddy system where, she says, "Māori and Pacific students come

together, to study together, learn together, achieve together, succeed together and celebrate together. Not just in statistics, but also in other subject areas too". Details [here](#)

Ihaka Lecture Series: Whether labelled as machine learning, predictive algorithms, statistical learning or artificial intelligence, the ability of computers to make real-world decisions is rising every year. The 2019 Ihaka Lecture Series, from March 13-April 3, brought together four experts at the interface of statistics and computer science to discuss how computers do it, and how much we should let them do it.

Bernhard Pfahringer spoke about the design and development of Weka and more recent projects.



Thomas Lumley spoke about how deep convolutional nets are structured and gave some intuition for how they can be effective, but also why they are brittle and can fail in remarkably alien ways.



Kristian Lum spoke about algorithmic fairness and about ways in which policy, rather than data science, influence the development of these models and their choice over non-algorithmic approaches.



Robert Tibshirani spoke about modern sparse supervised learning approaches that extend the lasso.



And lastly a success to share:

- Dr **Beatrix Jones** has been elected to join the Board of the International Society of Bayesian Analysis. This is in recognition of Beatrix's international standing within this community and the hard work she puts into this society.

*(With thanks to **Atakohu Middleton** for allowing me to extensively plagiarise the last 3 department newsletters she wrote at the beginning of 2019!)*



Thomas Li has been awarded the KiwiNet Emerging Innovator award, targeted to support early stage career scientists, “fast tracking them to become the future innovators of New Zealand”. The award includes \$20K of project funding as well as a programme of mentoring, professional development and publicity. The award is based on Thomas’ current research with NZTA, and his success in other research projects.

The 5-year Ministry of Business, Innovation and Employment (MBIE) and New Zealand Winegrowers sponsored precision Grape Yield Analyser (GYA) research programme, led by Lincoln Agritech Limited and including a team from UC (**Elena Moltchanova** (PI), **Daniel Gerhard** and **Rory Ellis**) was assigned Gold status for the 2017/18 reporting period, meaning that the programme is performing above expectation, is on track to deliver the primary deliverables, and that the broader results and benefits to end-users as well as the level of science involved are above expectations. Of the 253 MBIE annual reports received, only twenty-two (9%) received a gold status. Rory Ellis, a PhD candidate, has received the first prize for his presentation on the topic at the New Zealand Mathematics and Statistics Postgraduate Conference 2018 (NZMASP 2018) in Waikanae in November 2018.

Marco Reale is co-author of a paper selected to receive the 2019 AgResearch Science Prize. This is AgResearch’s premier recognition of outstanding achievement in research quality and comes with a substantive monetary prize to support future science endeavours. The paper is entitled *Intensified agriculture favors evolved resistance to biological control* and is authored by Federico

Tomasetto, Jason M. Tylianakis, Marco Reale, Steve Wratten, and Stephen L. Goldson (PNAS, 2017, 114 (15), 3885-3890).

On the Health and Wellbeing front, **Irene David** has fulfilled part of her retirement plan to train as a yoga teacher and is now giving weekly yoga classes to our School. So if you are visiting the School and will be here on Tuesdays at 1:30 then bring your yoga gear! **Jennifer Brown** has also been very successful in a 5 week international CrossFit competition, in which she was placed 3rd in NZ in her age group and was ranked in the top 10% of the 3500 women across the world in her age group.



Irene David



Jennifer Brown

University of Otago: Biostatistics Unit

by ANDREW GRAY



We've had another productive and fun six months in Dunedin. Dr **Claire Cameron** was co-author on an article on Legionnaires' disease published in the top infectious diseases journal, *The Lancet Infectious Diseases* (see [here](#)). As well as being an outstanding achievement for Claire, this yet again illustrates the importance of high-quality biostatistics in collaborative health research projects.

A series of biostatistics forums have been organised by Claire and Dr **Jill Haszard** which have been well attended by biostatisticians, statisticians, and other researchers from within and outside the University. Each forum provides an overview of a particular topic followed by discussion. These enjoyable and informative sessions have so far covered statistical significance

and the American Statistical Association's statement on p-values (Jill and Claire), data sharing and the National Ethics Advisory Committee's draft standards on the sharing of data files (Dr **Ari Samaranayaka**), approaches to handling missing data (Jill), approaches to determining sample size requirements (Associate Professor **Robin Turner**), and dealing with small data sets (Dr **Ella Iosua**). These forums have also provided much inspiration for our monthly (video conference) meetings with colleagues in Dunedin, Christchurch and Wellington.

We have also had multiple successes in various HRC funding rounds so far this year, including two projects where Ari is collaborating on being funded, with another project involving myself also being funded.

University of Waikato

by CHAITANYA JOSHI



Steven Miller left the Department in June after ten years' service and moved to Wellington to join Trade Me as a senior member of their data analysis team. Steven was a valuable member of the department. We thank Steven for his service and contributions over the years and wish him

and family the very best for their future.

Chaitanya Joshi presented his work on Adversarial Risk Analysis at the seventh symposium on Games and Decisions in Reliability and Risk (GDRR) held at the George Washington University in May.