MONITORING MAGIC
Designing new programmes for elite netball

MEETING THE CHALLENGE
Protecting NZ’s biological heritage

GOOD PICKINGS
Robotic revolution in the orchard
Our world is facing challenges like never before; food production is struggling to support population growth, communication is becoming more complex, and efficiently managing the resources we have available is becoming increasingly difficult.

And while these challenges can be intimidating, they also represent exciting opportunities. Alongside local business and industry, our researchers have established a strong track record of creating, developing and commercialising world-leading technologies spanning a vast array of fields.

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With great challenges come great opportunities
Professor Clarkson was tasked with bringing together researchers from all eight New Zealand universities, seven CRIs, and to work with end-users from government agencies, including the Department of Conservation, the Ministry for Primary Industries and other interested parties, such as Fonterra and DairyNZ, to consult and develop a research proposal to submit for government approval. “Essentially, we worked towards a ‘one ecosystem’ research agenda for biodiversity and biosecurity and also considered economic, social and cultural outcomes,” says Professor Clarkson.

The overall aim of this 10-year challenge is to reverse the decline of New Zealand’s biological heritage, and to do that it’s necessary to understand the distribution and status of New Zealand’s introduced and native biota, improve our ability to detect and eliminate threats, and ensure ecosystem resilience in the face of increasing global environmental pressures. Government direct investment in the challenge is $63.7 million but the aligned research which the challenge depends upon exceeds $200 million.

Professor Clarkson says in the eight months following the initial decision to fully fund the challenge, facilitated workshops involving 108 participants from the research providers and 22 participants from end-user/stakeholder organisations fleshed out the potential research projects from the original proposal. Fourteen projects in all were developed but only seven were progressed for early consideration by the End User Advisory Panel, Kahui Māori and Governance Group. Three have now reached the contracting phase; others will be further refined and reassessed before year end. “It’s very rewarding to see all the planning and development coming to fruition with the first three projects likely commencing in July of this year,” says Professor Clarkson.

The first project will develop a New Zealand-wide framework and platform for biological heritage measurement and monitoring using environmental DNA (eDNA) data. It will, in turn, allow accurate detection and monitoring of biosecurity incursions while also underpinning environmental monitoring and reporting at different scales.

The Biological Heritage National Science Challenge was launched in August last year and in July this year three major projects get underway. The University of Waikato’s Professor Bruce Clarkson is the interim director of the Challenge.
The second project is focused on pest insects, namely the management of introduced wasps which are threatening our forests and walkways, taonga species, our agriculture and horticulture. Scientists will co-develop four new technologies for insect control (with appropriate tactical, strategic, and end-user considerations), using the common wasp as a test species and assess the economic feasibility, social acceptability and practicality of each technology for large-scale deployment.

The third project is about tracking invasive species. "We know that various weeds and pests arrive at the border in containers or imported products but we need to know more about their pathways for spread," says Professor Clarkson. "Once we know more about how different pests 'travel', we'll be able to deal with invasions in a more controlled and targeted way." This project will combine network modelling with invasions in a more controlled way. This project will combine network modelling with invasions in a more controlled way. This project will combine network modelling with invasions in a more controlled way.

Professor Clarkson is widely recognised as an authority on ecological restoration and has been a key driver of projects in the Waikato to restore locations to their original habitat. He was a keynote speaker at the Sri Lanka Business and Biodiversity Platform event in Colombo recently, and in November will speak at the Green Urban Scape Asia Congress in Singapore.

Professor Clarkson is concerned that some of the good progress made in restoring urban habitats, including gullies is stalling due to reduced funding. "The multiple benefits of green space provide a good payback for a relatively small investment compared to the costs of major infrastructure like roads and bridges," he says.

Some University of Waikato academics, Professor Clarkson included, are urging the councils in the Waikato area to work more collaboratively to plan a future for a region that understands and naturally responds to the land and resource demands of an ever-expanding Auckland, and ensures there's a portfolio of assets that will give Hamilton and the Waikato profile, credibility and competitiveness in an increasingly global market.

University of Waikato's Professor of Environmental Planning Iain White says Auckland is ahead of Waikato in its planning for growth and Waikato needs to respond to this challenge. "While there are administrative boundaries on paper between Auckland and the Waikato, in reality they are easily crossed," Professor White says. "So it's important that Waikato identifies the opportunities and threats posed by Auckland's growth."

Environmental Planning graduate Lana Gooderham was awarded a University of Waikato Summer Research Scholarship to work with Professor White and the Waikato Regional Council to investigate potential impacts of Auckland expansion on the Waikato region. The Auckland region's population is expected to reach two million by 2031.

"The Waikato will face increased demand for water and aggregate resources, and there's likely to be pressure on roading infrastructure, soil quality, quality farm land and natural areas in the North Waikato," says Lana. "Clearly there's potential for conflict between land uses in the rural area as demand for the land increases, but careful planning can help us respond to these conflicts."

For her research, Lana looked at case studies in Dublin and the US to examine how the growth of major cities impacts on neighbouring regions. She also interviewed stakeholders in Waikato and Auckland to understand the New Zealand context.

The research revealed that the Waikato needs to investigate ways to capitalise on Auckland's growth. "For instance, Hamilton could attract specific industry to the city and become a hub or centre of innovation with strong transport connections, encouraging economic growth and development in the city," she says.

Urwyn Treblico, Principal Policy Advisor at the Waikato Regional Council, says Lana's findings, presented in a 50-page document to the council's strategy and policy committee, will help his council better understand how pressures on our environment may change as a result of Auckland's growth, and the opportunities the Auckland growth provides for the Waikato region. "The report is already helping inform strategic discussions by local authorities in the North Waikato, and development of the Waikato Spatial Plan," he says.

Professor White is advocating a Waikato plan that takes into account the dynamics of long-term change, takes a regional perspective on growth and considers how best to maximise the strategic advantages that the Waikato holds, from quality of life to green infrastructure and natural resources.

"Take water for example. It's a key Waikato asset, it can provide habitats, generate power and service industry, but Auckland wants to use that too and is aiming to take an extra 200,000 cubic metres of water a day from the Waikato River to service their future growth. In short, we need to plan for the future better so we aren't just reacting to the plans of Auckland."

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Resisting the Surge

As electronic circuits become more sophisticated, consumer electronic products are becoming more sensitive to power issues such as high voltage surges and spikes. Bring on the S-TVQ.

It’s a supercapacitor-based surge protector, invented by University of Waikato electrical engineering senior lecturer Nihal Kularatna and developed in partnership with Thor Technologies, an Australian manufacturer of power protection products.

Mr Kularatna’s technology was one of three winning ideas in the University’s 2010 Jumpstart competition; the prize being initial investment to support early technical developments.

WaikatoLink CEO Duncan Mackintosh says that initial investment and developments were a critical step towards seeding meaningful engagement with Thor Technologies whose market expertise was invaluable for evaluating the commercial potential of the technology.

Thor’s involvement soon led to a joint development partnership and a commercial licence. “It’s an excellent example of the value that can be created from early engagement and an open dialogue between universities and industry,” says Mr Mackintosh.

Following a four-year-plus partnership with Thor, which involved multiple visits, about 17 circuit modifications, product approval processes and ongoing testing by Mr Kularatna’s research team, the S-TVQ hit the Australian and New Zealand markets in early 2015.

Thor Technologies Managing Director George Forster-Jones says sales are already progressing well and early market feedback has been exceptionally positive.

Mr Kularatna says the S-TVQ is like an electronic shock absorber and can be used for devices such as desktops, computers, tablets and TVs. “The next stage with Thor involves optimising the S-TVQ for various countries and exploring alternative applications for the base circuit and we’re also exploring new R&D projects.”

Mr Mackintosh says the Thor-University collaboration demonstrates that investing the time to build strong partnerships can lead to ongoing, mutually beneficial opportunities.

“When you have a new technology concept, it’s a good idea to engage with industry early, treat IP with responsibility but also flexibility, and recognise that it’s a partnership from the start.

“As we can see from the journey with Thor, good things take time. But by investing in a partnership-based approach, we can build the foundation for sustainable outcomes from R&D and commercialisation.”

See next page for more commercialisation.

Making a Difference

Another good example of Waikatolink taking a raw technology through the development process to commercialisation is 11Ants Analytics, with its roots in the machine-learning expertise from the Faculty of Computing and Mathematical Sciences. It was sold in April this year to Air New Zealand and Canadian marketing and loyalty analytics company Aima.

“Our partnerships with Air New Zealand and Aima will be invaluable in taking 11Ants and their services to the next level.”

11Ants’ main product is a cloud-based customer science platform, 11AntsRAP, for the retail sector including supermarkets and fuel retailers, which turns customer data into insights to enable deeper customer relationships.

Duncan Mackintosh, CEO of Waikatolink, says the journey of 11Ants Analytics is a great example of how ground-breaking university research, which has been supported by dedicated commercial development, is now adding tremendous value to the world’s largest companies. “Our partnerships with Air New Zealand and Aima will be invaluable in taking 11Ants and their services to the next level.”

Earlier this year Ligar, a startup developing molecularly imprinted polymers (MIPs), co-founded by Waikatolink, secured an investment of hundreds of thousands of dollars from agribusiness Wallace Corporation, operator of New Zealand’s largest animal products-rendering facility, to fund a range of industrial trials that could see it commercialise some products this year.

Ligar is developing MIPs for purification and extraction applications that solve a growing need for many industries to extract both valuable and unwanted substances from their products. It has already used its specially-designed molecules to remove agri-chemicals and smoke taint from wine and is now investigating food and beverage purification and metal extraction. The polymers are like hungry plastic sponges that can be formed into any shape to exactly mirror and bind to the target in a solution.

The science behind Ligar originated and continues to be developed by its chief scientific officer Miruna Petcu, supported by a polymer development team at Wintec. The technology has been in development for three years and the spin-out company, set up in 2013 in a partnership between Waikatolink and Wintec subsidiary LearningWorks, is commercialising its MIP research.

Previously MIPs could only sense and detect molecules but Ligar’s technology also allows them to effectively filter molecules at a speed and quantity that opens up a wide range of commercial applications for the first time.

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University Waikato scientists have identified the existence of a possible fault under Hamilton. They say there’s no need for concern and much more work is needed to conclusively prove its existence.

Dr Willem De Lange, pictured, and Dr Vicki Moon used existing evidence to form their estimate that any risk of the possible fault causing an earthquake is slight. However, they want to carry out further research to answer two key questions: When did it last move and by how much?

The pair say their work shows indications of a fault running roughly from the Gordonton area, northeast of Hamilton, towards Temple View in the southwest.

The possible discovery changes nothing in terms of risk to the city’s residents, Dr De Lange says. “If it is a fault, it’s always been there, we just didn’t know about it.”

Dr Moon says her research shows what she interprets as changes in soil strata caused by a fault and she has also found what she believes to be evidence of liquefaction at sites around the region.

The amount of data backing the presence of a fault was growing, she says. “There are just too many coincidences.” The reason it hasn’t been found before is because no one has really looked.

The Waikato landscape has been heavily modified and is overlaid with metres of soft sediments laid down many thousands of years ago, meaning little or no evidence of fault lines remain. The main piece of evidence for the existence of a fault comes from an excavation in Hamilton’s northern suburbs. Dr Moon says it appears to show faulting across a four-metre width and indicates vertical movement of about 500mm.

They say aerial photography gives no indication of the direction the fault runs, although detailed measurements of the shape of the landscape suggest the distribution of hills in the area may be indicative. Sharp, right hand bends in the Waikato River may also be an indication of faulting.
New qualifications for good behaviour

New Zealanders spend $1.5 billion a year on companion animals. That includes food, immunisation, addressing health issues and in some cases, paying for behaviour therapy. Dr James McEwan from Waikato University’s School of Psychology says animal behaviour problems are the number one cause of euthanasia in dogs. Waikato is the only university in the southern hemisphere to offer postgraduate qualifications in clinical animal behaviour. Dr McEwan says while some problems can be dealt with by every-day dog trainers, animals with more serious problems such as phobias, separation distress and serious aggression require treatment that involves a more in-depth knowledge of the ethology and psychology of animal behaviour. The Waikato qualifications are delivered entirely online and are aligned with the British Animal Behaviour and Training Council standards.

http://www.waikato.ac.nz/fass/cab/or email clinab@waikato.ac.nz

Boiling water far away the fast way

A 3000km trek from Cape Reinga to Bluff inspired University of Waikato engineering student Luke Sinclair to design an ultralight wood-fired stove that can boil a litre of water in less than 10 minutes.

“We look to the wilderness for an escape from the chaos of everyday life, yet we often carry shoulder destroying packs full of wasteful gas canisters,” Luke says. “While initially convenient, when they run out they can leave you in the middle of a mountain range eating cold beans,”

Luke says, speaking from experience.

As part of his final year, Luke completed extensive research and testing to develop a highly efficient, lightweight and functional backpack stove, ideal for campers, trampers, extreme adventurers or any outdoor enthusiast.

“The design of the Trail Blazer integrates rocket stove efficiency with an outer cone that insulates the chamber while also acting as a sturdy base. A removable feed tube allows easy access to the chamber when starting a fire and the feed tube is angled to allow fuel to feed the fire automatically as it burns.”

The design also ensures a clean burning flame and no mark is left on the environment. “Secondary combustion is achieved as air heated against the feed tube is angled to allow fuel to feed the fire automatically as it burns.”

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Boiling water far away the fast way

Waikato professors win Rockefeller Grant

ProfsPriya Kurian and Debashish Munshi have been awarded a Rockefeller Foundation Grant to organise and host a major international symposium in Bellagio, Italy, called Climate Futures: Re-imaging Global Climate Justice. Climate justice is about addressing the unequal burdens created by climate change, and how its causes and effects relate to the concepts of justice - environmental and social. It’s something the two Waikato professors have been researching for a good while and they are known internationally for their research in this area. Their international partners on the grant are Professors John Foran and Kurn-Kurn Bhavnani of the University of California, Santa Barbara. Professor Munshi says the three-day symposium in July will bring together the best minds from both hemispheres from across the natural, physical and social sciences to brainstorm ideas, with a strong emphasis on issues affecting climate change in Asia, Africa, Latin America and the Pacific.

Living in a single-industry town

Tokoroa is a mill town, a single-industry town that’s had its share of job losses and redundancies over the years.

For her PhD, Fiona Hurd studied how industrial communities change – economically, socially and culturally – when there are widespread changes in the global economic, political and commercial environment.

“Typically, towns founded on one industry are populated by migrants, from New Zealand and overseas,” says Dr Hurd who had her doctorate conferred at Waikato University in April. “At one stage Tokoroa had about 20,000 residents, and 6000 of them had jobs related to the industry. Everyone had a mill connection. Today there’s a permanent mill staff of about 100.

“When the structure of the industry changes it has a huge impact. As an outsider, you anticipate social decline as unemployment rises, a view reflected in the media portrayal of these towns.”

But what Dr Hurd found surprised her. “Past and current residents are passionate about the town. I found a wealth of community resources, cultural identity, and a strength and resilience there.”

She says the aim of her research was to bring a “face” to the impacts of decisions made in the boardroom, and she feels work like hers is critical to today’s focus on sustainable business practices.
The University of Waikato’s AgriEngineering Group is growing rapidly as researchers apply smart technologies to solve problems in New Zealand’s primary industries.

The group is led by Dr Rainer Kunnemeyer – who has been working with Plant and Food Research on projects related to fruit sensing and milk quality – and Dr Mike Duke, who has been developing automation of forestry nursery processes with Callaghan Innovation and forestry company ArborGen.

Mechanical engineering graduate Ben McGuinness joined the group and developed a robotic drilling machine that is in its third season at ArborGen, reducing rejects and increasing productivity.

“Many of New Zealand’s agricultural companies use antiquated equipment and processes ripe for automation,” Dr Duke says.

The group has also developed a semi-automatic pine tree seeder and is working on a machine to harvest and grade seedlings.

Ben is now studying for a PhD with a Callaghan Innovation scholarship, investigating machine vision systems to grade seedlings.

“This is a very difficult problem, as the grading has to be done in the fields, during the harvesting process and be able to activate a mechanism to direct ‘pass’ and ‘reject’ seedlings into the right boxes. Just to make it even more challenging, it has to process 120,000 seedlings per day,” Dr Duke says.

After presenting their robotic driller work at an event at RoboticsPlus, the pair were invited to join a consortium to develop robotic kiwifruit and apple pollinators and harvesters.

The four-year project is a collaboration between RoboticsPlus, Auckland University, Plant and Food Research, and Waikato University. It received $7.65 million from the Ministry of Business, Innovation and Employment in 2014 while RoboticsPlus is also providing $2 million.

Dr Duke says there is a global push throughout the horticulture industry to improve efficiency and profitability through automation. “In the US, there is a big push to harvest and pollinate apples automatically. In New Zealand it’s apples and kiwifruit,” he says.

Currently orchardists use inefficient saturation spraying to pollinate vines. “Of that, less than 1% pollinates and 99% is wasted.”

The robotic pollinator will target spray directly at flowers.

The project has three aspects: the machine vision; the spraying system, and hardware and automation, which is where Waikato works closely with RoboticsPlus director Dr Alistair Scarfe.

“Dr Alistair Scarfe has made the best prototype kiwifruit picker. He’s a young engineer and very, very talented. He is a key commercial partner,” Dr Duke says.

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EMBEDDED WITH THE MAGIC

Outside the Netball World Championships, the ANZ Championship is the toughest netball competition in the world, forcing athletes and coaches to look at ways of gaining any advantage over their opposition. However, most of the research on the demands and performance of players is outdated and doesn’t correspond to what’s being asked of players in the professional era.

Shannon O’Donnell has been awarded a University of Waikato – Kia Waikato Bay of Plenty Magic doctoral scholarship – a $22,000 stipend a year for three years, plus tuition fees – to study performance enhancement and recovery in elite netball players.

She’s spending the championship season going to training and attending games gathering data on performance-related research. Her PhD supervisor is Dr Matt Driller, a sports physiologist from Waikato’s Department of Sport and Leisure Studies and who already works closely with the Magic netballers, having previously worked with Magic coach Julie Fitzgerald at the Australian Institute of Sport.

Dr Driller says Shannon’s research will provide an insight into the game demands of netball at the elite level and provide cutting-edge research into ways of improving recovery in some of the world’s best netballers.

Coach Fitzgerald agrees. “It’s a very exciting development for Kia Magic to partner with the University of Waikato and bring Shannon into our team. I think she’ll bring a level of sports science combination and there should be more.”

Her first task was to come to grips with the technology that allows her to code all games for analysis, look at match statistics and video footage, drilling down on such things as centre passes, shots and turnovers, and areas on court where gains and losses occur.

Shannon’s based at the Avantidrome in Cambridge where the netballers often train and where University of Waikato sports scientists work with a number of New Zealand’s top athletes on performance-related research.

And Dr Driller hopes that this partnership will be the first of many between the University of Waikato and other sporting organisations.

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LAW IN THE VIRTUAL WORLD

With more and more of our business and personal affairs being carried out on the internet, lawyers and judges will need to get a better handle on the law’s role in cyber security.

The security and privacy of our internet transactions and of our increasingly virtual assets has become an essential and necessary concern of modern living.

“‘There aren’t many people studying the law-computer science combination and there should be more.’”

University of Waikato’s Acting Dean of Law, Wayne Rumbles, is a cyber-law specialist. He says the issue is complicated by the fact that the material on the internet often isn’t physically located in any one place, so it can be difficult to identify theft. A further complication arises from determining what material is properly in the public realm and what remains private - the network environment, the Cloud and Google docs are examples of grey areas.

It’s only a matter of time before New Zealand courts are faced with a case of ‘virtual property’ theft and they need to be prepared for it, Mr Rumbles says. “This is made more difficult because few people in the legal field are investigating either aspects of virtual theft or the legal boundaries of publicity and privacy in the net, in an international situation where countries’ laws differ.

“If information from a law firm or medical details of someone were hosted via an off-shore Cloud service, and was somehow disclosed, the business holding that information in New Zealand would be liable for prosecution under New Zealand’s privacy laws.”

Mr Rumbles says lawyers need to understand the network, and computer scientists need to understand the law and how it will be applied to the unique virtual environment.

The University of Waikato offers New Zealand’s only Master’s degree in cyber security and Mr Rumbles teaches several papers on cyber law.

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University of California and Waikato sign new agreement

The University of Waikato has strengthened its ties with the University of California (UC) with the heads of both institutions signing a new agreement. The two universities have had a long-standing arrangement for the exchange of students, and some research collaborations, but this new agreement will allow for the development of stronger collaborations and sharing of knowledge in key common areas.

These interests include coastal marine and freshwater, environmental science, sport, indigenous studies, agribusiness, computer science, management and education.

The University of California has 10 campuses, 235,000 students, 190,000 staff and contributes $46 billion to the Californian economy and while Waikato runs a much smaller model of university, Vice-Chancellor Professor Neil Quigley says Waikato has established a reputation for tackling some of the world’s big problems.

Letters from the Front

A new symphony to mark 100 years since the Gallipoli landings had its premiere with the New Zealand Symphony Orchestra in Wellington just before ANZAC Day. Letters from the Front was written by University of Waikato composer Mike Williams and inspired by the letters written by his great-grandfather, killed at Passchendaele in 1917.

“I began by reading the letters he sent home to his children, and then I read numerous articles, and a lot of books, mostly found in second-hand shops. Some of those young men wrote so beautifully, were so poetic, their letters were amazing,” says Mr Williams. It didn’t matter who was writing the letters, the themes were universal. “Whether the soldiers were German, French, Russian, New Zealanders or Australians – the sentiments they were expressing in their letters were exactly the same across the board. It blurred the lines between ‘goodies and baddies’.”

Mr Williams took a contemporary music approach to the 30-minute symphony, “using different methods of organising the pitch”, which he says was different from anything he’d done before.

The work includes parts for a narrator and soprano, filled by George Henare and Madeleine Pierard for the premiere, and the work was also performed in Auckland and Sydney during the build-up to ANZAC Day.

More investment needed in science and engineering

An Australian avionics systems engineer who helped build, test and launch the Rosetta spacecraft that successfully landed a probe on a comet (Comet-67P) says New Zealand and Australia should be investing more in science and engineering.

Warwick Holmes spent 29 years working on European Space Agency (ESA) spacecraft projects and missions, including four-and-a-half years on the Rosetta project. He recently returned to live in his home-town Sydney and says he’s disappointed to find engineers and scientists Downunder so poorly paid, when to his mind they should be among the top earners.

Mr Holmes visited the University of Waikato in April to give one public lecture about the Rosetta mission, and another to secondary school students, showing them “how to cook a comet” and encouraging to study the STEM subjects – science, technology, engineering and maths.

It was in November last year, 10 years and 6.4 billion kilometres after launching, that the Rosetta landed the Philae probe – a 100kg robot laboratory “about the size of a washing machine” on the comet.

Once he saw and celebrated the landing at the ESA control centre in Darmstadt, Germany, Mr Holmes thought it was time to retire from working in the European space sector and with ESA. “After Rosetta, everything else was just uninteresting,” he said.

More investment needed in science and engineering

Asking the right questions in your company

A staff survey with a difference has been developed by Ask Your Team, a Hawke’s Bay-based company with global aspirations, and the University of Waikato.

The Ask Your Team system involves anonymously surveying staff on the key drivers of organisational success, developing action plans in response to performance gaps and then re-testing to measure progress.

Professor Frank Scrimgeour from the Institute of Business Research at the University of Waikato says the Ask Your Team founders had already developed survey instruments but by working with IBR staff over 18 months, they were able to critique those instruments on the basis of business theory and in terms of communication and applicability.

“They wanted to work with a university that had some credibility to test out their ideas about how to improve management capability in New Zealand. They were aware of our business performance work, and we liked their idea,” says Professor Scrimgeour.

Together they developed their 13 Organisational Success Factors and identified the most powerful assertions that lead into those 13 areas. There are 65 assertions and staff say how well they think the organisation is performing on each.

Ask Your Team CEO Chris O’Reilly says the system measures the gap between where the leaders say the company is at and what staff are saying. “The smaller the gap the better the alignment. The wider the gap the more there is a disconnect. It’s all about trying to improve the organisation and the fundamental premise is people doing the job know best how things are going.

“What’s so good about it is that you get relevant, real-time results. All of the assertions address issues directly related to making the boat go faster.”

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“They wanted to work with a university that had some credibility to test out their ideas about how to improve management capability in New Zealand. They were aware of our business performance work, and we liked their idea,” says Professor Scrimgeour.

Together they developed their 13 Organisational Success Factors and identified the most powerful assertions that lead into those 13 areas. There are 65 assertions and staff say how well they think the organisation is performing on each.

Ask Your Team CEO Chris O’Reilly says the system measures the gap between where the leaders say the company is at and what staff are saying. “The smaller the gap the better the alignment. The wider the gap the more there is a disconnect. It’s all about trying to improve the organisation and the fundamental premise is people doing the job know best how things are going.

“What’s so good about it is that you get relevant, real-time results. All of the assertions address issues directly related to making the boat go faster.”
Computer scientist Associate Professor Masood Masoodian is working on an international project that could help stem the spread of infectious diseases.

His prime focus is the southwest Amazon region where deforestation, new road building and climate change have all contributed to the spread of diseases, in particular, various types of Leishmaniasis. This disease is spread by sandflies, often passed on from animals to humans. It can seriously disfigure and sometimes lead to death.

Dr Masoodian and his colleagues are developing software applications, some specifically for mobile devices, which will allow health practitioners and researchers working in the field to collect patient case data, including relevant geospatial information. The collected datasets can then be visualised to provide important information, such as the locations where the targeted diseases are found, and then track the path and speed of their progression, as well as identifying causes contributing to their spread.

“We will also be able to break down the data into seasons or years which will help us to learn more about the diseases’ habits over time,” says Dr Masoodian.

The project is being led by Professor Manuel Cesario, a medical doctor from the University of Franca, Brazil. He’s a member of the Scientific Committee of the Program on Global Environmental Change and Health ESSP (Earth System Science Partnership).

A number of apps have been developed for this project at Waikato over the past few years, with assistance from students on summer research scholarships, but the academics are on constant lookout for financial support, applying to funding bodies such as the WHO and the Brazilian government.

“Not only do we want to assist in reducing the spread of Leishmaniases, the apps will of course have use in tracking and treating other previously neglected diseases and, as a spin-off, we’re now developing a game app that can be used to teach people how to minimise their risk of contracting the disease,” says Dr Masoodian.

Interested in working with Waikato?
Email research@waikato.ac.nz

Mangrove forests up to 20 metres high, wasps and a whole lot of mud have been the making of an intrepid journey for three University of Waikato scientists conducting research in Vietnam.

Senior lecturer Dr Julia Mullarney and technical officer Dean Sandwell, pictured, and PhD student Benjamin Norris have just returned from living on a river boat in the Mekong Delta where they were studying currents in the mangrove forests as part of an international collaborative research project.

“We’re studying currents around the roots of mangrove trees to determine how the obstacles affect waves and currents. The work we’re doing has implications for sediment transport which in turn controls the expansion or shrinking of the delta as a whole,” says Dr Mullarney.

For the three travellers, a typical day started at 4.30am and involved taking an inflatable boat loaded with equipment through the waves and into the mangrove forests at the seaward end of Cu Lao Dung Island. The team then deployed oceanographic instruments in a variety of configurations and completed photogrammetry surveys of the area.

Mr Sandwell says the project was a unique challenge. “Navigating our small inflatable research vessel through a surfzone inside the trees was quite unusual. Additionally, several of our instruments are primarily designed for the laboratory so we had to be creative in our methods of deployment. We used Vietnamese fishing boats, kayaks and tree huts as platforms to power and run instruments, which allowed us to monitor currents in real-time at high frequencies (greater than 50 times a second),”

April’s trip was the team’s second trip to the region and it has already become apparent that things have changed since their last visit. “The forest appears to be expanding on one side of the island and shrinking on the other. In a region highly threatened by climate change and sea level rise, discovering what causes these differences is crucial,” says Dr Mullarney.

The work is part of a USA Office of Naval Research funded project. The principal investigators are University of Waikato staff Dr Julia Mullarney and Associate Professor Karin Bryan. The project also involves investigators from Vietnam, the USA and the Netherlands.

Since their return to New Zealand, the team has started to examine the data collected and will work with Dr Bryan to develop a numerical model of the movements of the mangrove forest and water and sediment movement.

Interested in working with Waikato?
Email research@waikato.ac.nz
The University of Waikato’s Traffic and Road Safety (TARS) laboratory is a major influencer of New Zealand road safety policy.

It is TARS research that led to lowering the alcohol limit from 80mg per 100ml of blood to 50mg, restrictions of cellphone use in vehicles and raising the minimum driving age from 15 to 16.

The researchers, pictured, Associate Professors John Perrone, Samuel Charlton, Nicola Starkey and Robert Isler used to have to spread themselves over four Waikato locations, but they now work at a single site on the University of Waikato’s Hamilton campus.

The new lab has an extensive collection of innovative technologies for studying driver behaviour, including sophisticated eye tracking equipment and the most advanced driving simulator in Australasia.

Interested in working with TARS at Waikato?
http://www.waikato.ac.nz/fass/research/centres-units/tars

New book featuring the life and art collection of Hawke’s Bay lawyer-turned-farmer H W (Bill) Youren is the latest project for Waikato University historian Dr James Beattie.

Youren was a left-wing pacifist who in the 1950s developed a keen interest in the new Chinese communist regime, visiting the country three times to gain an understanding of its history and culture and, encouraged by Rewi Alley, started collecting Chinese art. “They saw art as a way to break down the ‘bamboo curtain’ – to put a more human face on the country,” says Dr Beattie.

Back in New Zealand Youren attracted the attention of New Zealand’s SIS, which monitored Youren for more than 20 years.

MTG Hawke’s Bay – the regional museum and art gallery – holds Youren’s extensive collection and called in Dr Beattie and Canterbury University art historian Dr Richard Bullen to assess its scope and value.

Visions of Peace is available from MTG Hawke’s Bay and online at www.booksnz.com/products/

What’s On at Waikato
The University of Waikato links with the community on and off campus

National Agricultural Fieldays
10-13 June, 2015, at Mystery Creek, near Hamilton
The University of Waikato has been a strategic partner with Fieldays since 1997. This year’s Fieldays theme is Growing Capability in Agribusiness and the Waikato University premier feature stand will highlight research and innovation in robotics, rural and urban environmental planning, and water monitoring.

Fieldays.co.nz

Waikato Winter Lecture Series
Hamilton, every Wednesday in August
Comedian Te Radar opens this year’s series on 5 August presenting Things You Never Knew About Hamilton. Professor of Environmental Planning Iain White hosts a panel of experts to debate water issues on 12 August. On 19 August we ask Is New Zealand Really a Multicultural Society? and finish the series on a light-hearted note on 26 August with comedian Jan Maree in An Ode To Hamilton.

Kingitanga Day
Thursday 17 September, 2015
This important day in the University calendar celebrates the University’s distinctive heritage, history and relationships with the community, through lectures, activities, food stalls and music, on the Hamilton campus.
WHERE THE WORLD IS GOING

TE AHUNGA O TE AO