

December 2022 #110

SURVEYING + SPATIAL

Magazine

**COP27: FUTURE PATHWAYS
FOR NZ**

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**RESOURCE MANAGEMENT
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Focus on Land & Environment

Over the past few years, discussions around land management, regulation and environmental impacts have intensified, with several organisations proposing new ways to improve the current resource management framework.

In February last year, the Government announced that new legislation would come into effect to replace the current Resource Management Act as recommended by the appointed review panel.

An overhaul to the current system has been welcomed by many sectors, especially the planning, construction, survey and spatial industries as the new legislation seeks to update and streamline the complicated and often costly processes involved with new developments and consents.

The Resource Management Act has been a political hot potato for many years and the new legislation has also been critiqued across the political spectrum and by those within the private sector.

According to Environment Minister David Parker, the aim of the new reforms is to “better protect the environment while cutting red tape, lowering costs and shortening the time it takes to approve new homes and key infrastructure projects”.

He commented that the RMA processes have been slow to respond to new challenges in climate change and freshwater quality and the Government would prioritise the

Natural and Built Environments Act (NBA) and Spatial Planning Act (SPA) this parliamentary term and expected the Climate Adaptation Act (CAA) would be introduced to Parliament in 2023.

The new system would set environmental limits and targets “in relation to the objectives of protecting and restoring the natural environment and enabling development within limits”. These would apply to air quality, indigenous biodiversity, coastal waters, estuaries, freshwater, and soil.

There will no doubt be further development to this framework, and the emphasis on greater conservation measures, greater effect to the principles of Te Tiriti and speedier consent timeframes is both positive and progressive. There will, however, need to be additional consideration about the role of regional authorities and the Government’s more centralised approach, and most importantly, whether this comprehensive new legislation can streamline and improve better outcomes for all.

In this final edition of S+S for 2022, we’re focusing on a land and environment theme, with a range of timely topics from across the survey and spatial industries.

From the University of Otago, Mick Strack explores the streamlined reforms that are in progress for the 30-year-old Resource Management Act and how these new policies will



affect land and resource planning for New Zealand surveyors.

Beca’s Sustainability Co-Lead Lokesh Sangarya takes a look at the goals and objectives of the COP27 climate conference and what developments from this year’s conference will bring for New Zealand and Australia’s climate change frameworks.

NIWA presents their latest research in optimising the monitoring and surveillance technology for New Zealand’s remote coastal and marine environments and how we can measure the state of our marine environment and protect them from invasive species.

From the University of Otago, Devon Allen and Mick Strack examine restrictive covenants in subdivision developments.

And straight from the Wellington awards ceremony, we showcase this year’s winners of the 2022 Spatial Excellence Awards.

Finally, a big thank you to all our contributors and readers throughout 2022 from S+S, we wish everyone a very Merry Christmas and a safe and prosperous new year in 2023. •



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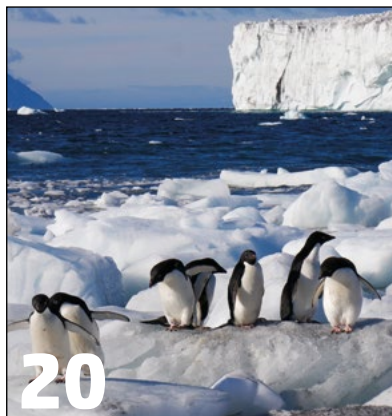
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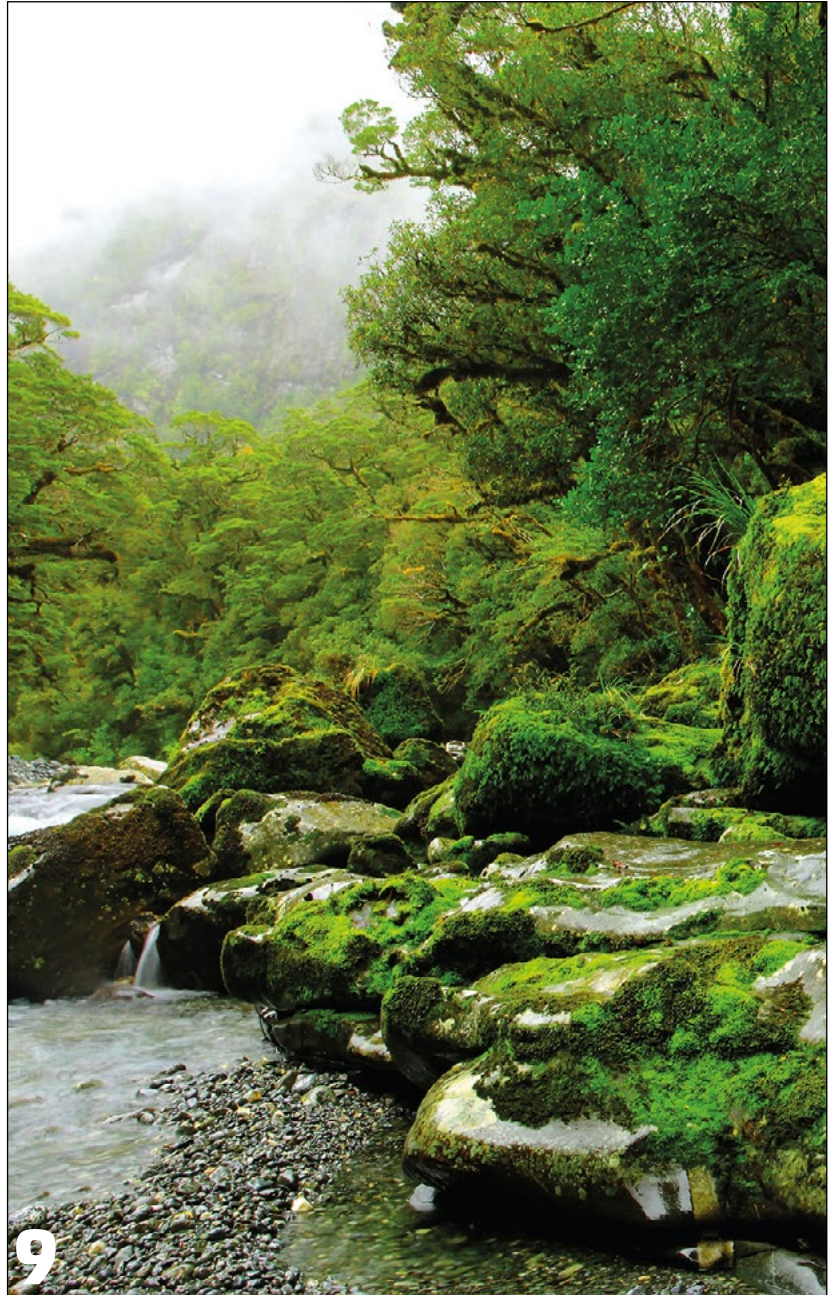
Contents

DECEMBER 2022

- 1 Editorial**
Rachel Harris
- 5 Why this year's
Climate Conference
is so important**
Lokesh Sangarya
- 9 Resource
Management
planning reform**
Mick Strack
- 13 Technology
provides views
of life in remote
habitats**
NIWA
- 16 Catching covenants**
*Devon Allen
& Mick Strack*
- 20 Adélie penguins,
climate change
and fisheries
management**
Dr Dean Anderson
- 22 Showcasing spatial
excellence –
industry awards**



-
- 27 Boosting diversity and inclusion: a win-win**
Roshni Sharma
 - 31 Blindsided by resignations?**
Mark Fisher
 - 33 Legal Column**
 - 34 Property addressing for in-fill development**
Anselm Haanen
 - 35 New Utility Location Standard released**
 - 36 News**
 - 38 University Happenings**
Richard Hemi
 - 39 Obituary: David Goodwin**
 - 40 Update on the new Archie Bogle book**
The Bogle Reprint Committee





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COP27
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WHY THIS YEAR'S CLIMATE CONFERENCE IS SO IMPORTANT

Lokesh Sangarya, Sustainability Co-Lead – Water, Beca

The 27th United Nations Climate Change Conference, more commonly known as COP27, kicks off on 6 November in Sharm El Sheikh, Egypt, under an unparalleled sense of urgency for global collaboration and meaningful climate action.

In this article, Lokesh Sangarya, Sustainability Co-Lead in Beca's Water team, explores the Conference of Parties' (COP) purpose and objectives; key achievements of COP26 in Glasgow last year; summarises what has transpired since then in Australia and New Zealand, and what to expect from COP27.

What is the Conference of Parties?

The COP is the supreme decision-making body of the UN Framework Convention on Climate Change (UNFCCC). The forum brings together the 197 nations and territories (Parties) – that have signed on to the UNFCCC. It plays a key role in ensuring countries negotiate and agree on climate change actions.



What's happened since COP26?



In Australia

Ranked last in policy **response to climate crisis** (across 60 countries emitting 92% of global GHG's).

\$1bn pledged to **protect the Great Barrier Reef**

Australia records highest temperature in 62 years hitting 50.7C in the north westerns coast.

Record-breaking rain floods towns and cities in QLD and NSW.

Once-in-100 year flooding happens for the second time in Lismore.

Independent review launched of **Australia's carbon credit scheme** with recommendations expected in Jan 2023.

State of the environment report released showing abrupt changes in ecosystem health, with at least 19 showing signs of collapse or near collapse.

Climate Act came into effect with a legislate goal to **reduce GHG emissions by 43% by 2030**.

Tiwi islanders **win court battle against gas company** over drilling in international waters.

Australia's biggest single carbon polluting power plant, Loy Yang A, **announce plan to close 10 years ahead of plan** from 2045 to 2035.

Australia signs on to the Global Methane Pledge to **reduce methane emissions by 30% by 2030**.

In Aotearoa New Zealand

\$4.5bn climate respond fund created using money raised through Emissions Trading Scheme.

New Zealand's average temperature in 2021 was highest on record, 1.09 degrees above average.

Te Waihangā releases first long-term strategy with net-zero, renewable energy and sea level rise as some priority investments.

New Zealand sets out **first carbon budget** as part of the **Emissions Reduction Plan**.

New Zealand launch their **first National Adaptation Plan** with over 120 actions to respond to risks raised in the 2020 climate change risk assessment.

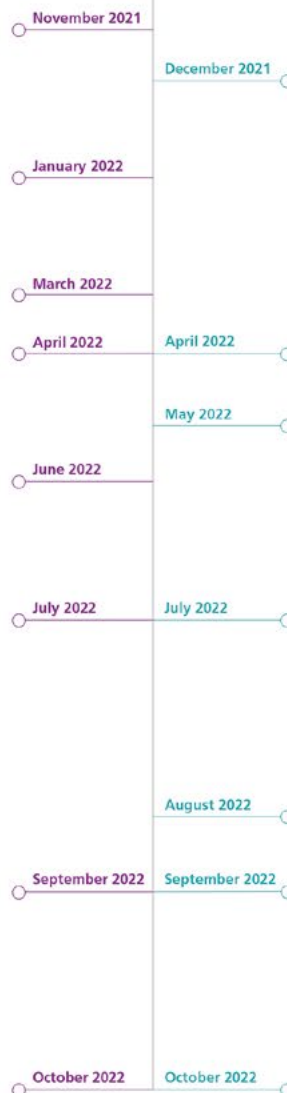
New Zealand records largest bleaching of sea sponges in a marine heatwave lasting 213 days.

Nelson receives more than **three times average August rainfall in 4.5 days** leading to **massive floods**.

Several regions in North Island **record warmest August day on record**.

New Zealand **reports warmest and wettest winter on record**.

New Zealand becomes the first country to **set an agricultural GHG emissions levy**.



Over the past 12 months both countries have faced the brunt of climate change with multiple climate disasters, from floods to record high temperatures, while also improving climate actions.

A key task for the COP is to review the national communications and emission inventories submitted by Parties. Based on this information, the COP assesses the effectiveness of the measures taken by Parties and the progress made in achieving the *ultimate objective* of the Convention – “to stabilise greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system.”

Political leaders gather at the conference to listen, negotiate, challenge, compromise, and agree on the climate change commitments they are willing to make.

Key highlights from COP26

COP26 took place in November 2021, a few weeks after the Intergovernmental Panel on Climate Change (IPCC) published its latest *Assessment Report (AR6)*. The report's key finding was that if we exceed global warming by 1.5°C compared to pre-industrial levels, we will cause unavoidable increases in extreme climate disasters and present multiple serious risks to our ecosystems and communities.

Negotiations delivered two key outcomes: the Glasgow Climate Pact was signed, and the Paris Agreement's Rulebook was established.

1. The Glasgow Climate Pact called on all countries to present stronger Nationally Determined Contributions (NDCs) by 2022 rather than by 2025. NDCs embody a country's efforts to reduce national emissions and adapt to the impacts of climate change.
2. The Paris Agreement rulebook lays out how countries are held accountable for delivering on their climate action promises and NDCs. This also set about establishing 1.5°C as the new 'north star' in policy target setting.

While there was global emphasis on taking serious climate action, many countries and NGOs expressed dissatisfaction on two matters: the language on coal usage was significantly weakened (from 'phase-out' to 'phase-down'), and the lack of transparency on delivering essential climate finance.

Australia and New Zealand had strong representation at the Conference. Australia's then lacklustre climate commit-

ments came under the spotlight, and their path to net-zero was scrutinised for not having clear plans or intermediate targets that were science-based. New Zealand's government announced a revised pledge, with a headline figure of a 50% reduction on gross 2005 emissions by the end of this decade.

Over the past 12 months both countries have faced the brunt of climate change with multiple climate disasters, from floods to record high temperatures, while also improving climate actions. These include the Climate Change Act, which came into effect in Australia in September 2022, the launch of New Zealand's first Emissions Reduction Plan in May 2022 and the country's first National Adaptation Plan in July 2022.

What can we look forward to at COP 27?

The world looks to this year's conference with renewed hope for concrete action. There will be increased pressure on Parties to deliver implementation pathways to limit temperature rise to 1.5°C.

Currently, the world remains far off track to limit climate change to the levels committed to in the Paris agreement. Glasgow commitments were shown to put the world on track for a 2.4°C increase by the end of the century.

The UN Secretary-General, Antonio Guterres has said *COP27 must deliver a "down-payment" on climate solutions* that match the scale of the problem. To measure success at COP27, hosts Egypt have set five main targets:

1. Shifting from pledging to implementation at scale and on time
2. Delivering on adaptation – need for transformative adaptation agenda
3. Clarify support for loss and damage
4. Delivering climate finance to developing countries
5. Ensuring a managed and just transition.

Negotiations will also be focused on concrete mechanisms to generate effective carbon offsets (as part of Article 6 of the Paris Rulebook) and contemplate the level of private sector participation. The lack of integrity in offsets has been brought to the forefront recently through claims of greenwashing, and perceptions of businesses trying to

'buy their way' out rather than investing in more effective emissions reduction measures.

Australia and New Zealand will play key roles in influencing crucial positive outcomes at this year's COP27 conference. A large focus of the COP27 will be on implementation pathways to previously agreed targets, and both countries will feel the responsibility to lead positive change.

We must also develop a mechanism to accurately monitor and report implementation progress. New Zealand's National Adaptation Plan (NAP) is essentially a plan to make a plan, and requires further consideration. Many of the actions highlighted in New Zealand's NAP will not deliver adaptation outcomes in and of themselves but provide the platform for action. Similarly, as we consider RMA reforms including the introduction of the proposed Climate Change Adaptation Act (CAA) – one of three proposed Bills – to deliver the reform, we know this will take time, inviting criticism that we're not moving fast enough.

How will future generations deem the success of COP27?

Key outcomes we should expect from COP27 include:

- Commitments to stronger emission reduction targets: New emissions reduction commitments to limit global temperature rise to 1.5°C are the desperate need. Countries must dramatically increase their NDCs and develop pathways with science-based targets for all investments and activities to reduce greenhouse gas emissions.
- Commitments to the amounts and timing of climate finance: The UN Secretary General recently called on developed countries to stop paying lip service to the \$100 billion pledge and provide clarity on future spend; thus far only *\$52.4 billion has been delivered* on average between 2013 and 2020 from bilateral and multilateral public finance. These funds are essential

to help developing countries with climate adaptation and a just transition. Clear deadlines and concrete delivery commitments are required to ensure that those who need funding most can access it.

- Outcome-driven conversations on 'Loss and damage': The effects of climate change disproportionately affect those who contribute least to emissions. Currently, one in three people do not have access to essential early warning systems ahead of climate disasters. There needs to be a concrete global response addressing the needs of communities on the frontlines of climate change.

A robust way to align projects to 1.5C

Beca is responding to the climate emergency on two fronts: by minimising emissions associated with our business operations (our carbon footprint), and maximising decarbonisation efforts through the solutions and advice we provide to our clients (which we refer to as our carbon handprint).

In New Zealand, Beca is one of the founding signatories to the *Climate Leaders Coalition*. As signatories, we have adopted short and long-term gross absolute science-aligned targets for Scope 1, 2 and 3 reductions needed to limit future warming to 1.5°C.

We are also responding to the climate emergency by aligning our actions and advice to our clients (including their projects and programmes) to limit global warming to 1.5°C.

Holding ourselves accountable and helping our clients do the same, we have designed a Science Based Targets Assessment (SBTA) methodology which allows us to assess a project's alignment with the emissions reductions needed to limit global temperature rise to 1.5°C. As we progressively roll this out in coming months, it will be used across the work we do with our clients to ensure that we make everyday better for present, and future generations. So, stay tuned! ●



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Resource Management Planning Reform

Mick Strack, Senior Lecturer, University of Otago School of Surveying

The current flurry of legislative and policy reform indicates that our Government and many ministries have recognised that the Resource Management Act era has led to some very unsatisfactory outcomes. Although its purpose was expressed as the sustainable management of natural and physical resources, there are many areas where that purpose clearly failed.

The quality and quantity of water resources has deteriorated, harmful emissions into the atmosphere have continued to increase, urban development has added to energy-inefficient spatial arrangements and a shortage of adequate housing, and highly productive soils have been lost.

New national policy statements have been introduced and the resource management regime is being reformed. Legislatively there is the Natural and Built Environments Bill (NBA), the Spatial Planning Bill and soon the Climate Adaptation Bill. New national policy statements for urban development, protection of highly productive land, and freshwater management have been introduced. The National Climate

Change Adaptation Plan is also now in place.

Legislative reform

Earlier this year an 'exposure draft' of the proposed Natural and Built Environments Bill was introduced, examined and reported on by the select committee. The full bill was then introduced in October 2022 and is currently open for submissions to the select committee. This bill will significantly change how land and resource planning is done in Aotearoa New Zealand. The purpose of sustainability has been reformulated as Te Oranga o te Taiao – the health and wellbeing of the environment. While the RMA was effectively silent on positive environmental outcomes and ended up being focused on



addressing the adverse effects of activities, and so required only the bare minimum of effort to protect the environment, the proposed bill will require outcomes that enhance the environment. The new bill will also more directly give effect to Te Tiriti o Waitangi.

As I see it, the main changes for surveyors will be through the consenting process. There will be just four categories of activities – permitted, controlled (probable), discretionary (possible), and prohibited, and there will be an expansion of the scope of permitted activities. Ideally this will provide more guidance and more certainty about acceptable activities. The National Planning Framework will provide for 14 planning documents (generally coinciding with current regional council boundaries). These will provide greater standardisation and consistency of plans while allowing consenting decisions to still be made at a local level.

The bill will not diminish the relevance of much of the recent resource management case law, so the lessons from the *EDS v NZ King*

Salmon case will remain relevant and perhaps more explicit, given the need to enforce environmental bottom lines. The recent policy statements and adaptation plans are clearly written to coincide with the proposed planning changes.

The Spatial Planning Bill “will provide for long-term regional spatial strategies that integrate land use planning, environmental regulation, infrastructure provision and climate change response”. Regional Spatial Strategies (RSS) will provide high-level strategic direction and integrate legislation covering climate change, land transport, other infrastructure and the national planning framework, and those regional entities will manage the preparation of the NBA plans.

The third proposed intervention will be the Climate Adaptation Bill which will deal with responses to climate change. These responses appear to be focused primarily on coastal hazards and include avoiding, protecting, accommodating, and retreating from the coast. Normal planning rules can generally deal with the first three response approaches, but retreat will require special mechanisms

and a funding regime that will provide for condemnation, relocation and com-

pensation. This is likely to be very challenging for both central and local government, and the question about who will be compensated (and how) will be highly contentious.

National policy statements

The 30+ years of the RMA, and perhaps other deficiencies in the planning regime, have led to a shortage of adequate housing but also extensive urbanisation and/or domestication of rural land around our cities and a significant decrease in highly productive land around Auckland, Waikato, Hawke's Bay, Horowhenua regions and around most of our cities. Central Government has developed interventions in the form of national policy statements (NPS) to address these issues.

Alongside the relatively recent (August 2020) NPS Urban Development which primarily seeks to increase urban density to facilitate increased housing builds, and includes policies to expand our cities upwards rather than outwards, the recently released (September 2022) NPS Highly Productive Land seeks to protect our rural land most suitable for horticultural production. As the Minister has stated: “We need to house our people and to feed them too. Our cities and towns need to grow but not at the expense of the land that's best suited to grow our food.”

Both these national policy statements will work in a complementary way to protect rural land and limit lateral urban growth. Ironically, in the reformulation of the planning regime, it seems we have come full circle to some degree. The 1977 Town and Country Planning Act had very similar goals within its Matters of National Importance (s3):

- (d) The avoidance of encroachment of urban development on, and the protection of, land

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scope of permitted activities.

having a high actual or potential value for the production of food;

(e) The prevention of sporadic subdivision and urban development in rural areas;

(f) The avoidance of unnecessary expansion of urban areas into rural areas in or adjoining cities.

It is also worth noting that the T&CP Act is mirrored in the proposed Natural and Built Environments Bill as it required *enhancement* of the physical, cultural and social environment as a matter of national importance.

In order to give effect to these NPS, local authorities will have to change their District Plans, although perhaps the drawn-out process of plan variations may mean that the new NBA plans are implemented before that is completed. Local authorities are required to map highly productive land, prioritise primary production, and avoid rezoning and subdividing highly productive land. Land use capability maps (LUC) have been created by Landcare Research Manaaki Whenua. These should form the basis for Regional Council mapping requirements, and in the interim, they will serve as the default maps identifying LUC 1, 2 and 3 land.

It is interesting to observe how some city councils have tried to reject the direction from central Government to implement these national policy statements. Christchurch City Council recently voted against implementing the new density standards which allow apartment blocks in inner-city suburbs. Will other councils seek to avoid such Government directives, and will they delay changing their district plans to give effect to those higher order documents? This conflict points to the fundamental question about who directs planning

decisions and at what level of government major developments might be planned.

The current Three Waters proposals also hinge around that same question.

National Adaptation Plan

Although it seems that the proposed third leg of the resource management reform regime – the Climate Adaptation Bill is some years off yet, in August 2022 the first national adaptation plan was released – “Adapt and thrive: Building a climate-resilient New Zealand”. The plan is regularly noted as providing for ‘managed retreat’, but there is little of substance to explain how that may occur beyond passing legislation ‘to support managed retreat’. The plan identifies adaptive management to build a more climate-resilient Aotearoa New Zealand. This will include the preparation of regular climate risk assessments to enable better decisions; to drive development in the right locations; and to help communities adapt and embed climate resilience into all of the Government’s work.

There is a strong emphasis on enabling Māori to participate in climate action, and to elevate te ao Māori and mātauranga Māori within the overall climate response.

The plan calls for improved hazard information to be made available – for example in Land Information Memoranda (LIMs), but this needs to be carefully managed. Recent attempts by local authorities to

Local authorities are required to map highly productive land, prioritise primary production, and avoid rezoning and subdividing highly productive land.

iden-

tify hazard

areas have been met with vigorous objections by proprietors, such that many LAs have backed off making such statements and predictions on the basis that property becomes devalued. However, the point should be that vulnerable land is notified to land owners by pricing signals.

The Adaptation Plan also connects with the recently drafted NPS for Indigenous Biodiversity by prioritising nature-based solutions to adapt to climate change and deliver other socio-economic and environmental benefits.

While the Adaptation Plan does not directly implement action, it provides guidance for Government to implement its high-level strategic goals for environmental management. All these developments mark a significant step beyond the 30-year-old RMA regime that has passed its ‘use by’ date.

The planning landscape is heading for major reform and the Government is currently assembling the pieces of the puzzle. Surveyors can take the lead in implementing change by responding to these guidance and regulatory documents. ●



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TECHNOLOGY PROVIDES VIEWS OF LIFE IN REMOTE HABITATS

NIWA

Aotearoa-New Zealand's marine area covers 167,650 square kilometres presenting a staggering distribution of climates, from subtropical to subantarctic waters, to understand and manage.

But it's likely we know more about the surface of Mars than we do about the seafloor of our marine environment.

To fill that void, Dr Leigh Tait, a marine ecologist at NIWA, is investigating better use of satellites, drones and remote operated vehicles (ROVs) to improve our understanding of life under the ocean.

The research is part of the Surveillance Tools and Technologies Project led by Dr Tait who is based in Christchurch.

His work with ROVs is specifically for biosecurity purposes and is funded by NIWA's Marine Biosecurity Programme while his research with satellites and drones is funded by other NIWA programmes.

NIWA researchers Hamish Sutton and Leigh Tait are setting up a drone with a 6-band multispectral camera and a Sony a5100 mirrorless camera for marine reserve mapping near Wellington. [Photo: Rebekah Parsons-King / NIWA].



The aim is to develop or optimise monitoring and surveillance technology to protect aquatic environments from invasive species and to measure the state of our marine environment.

The aim is to develop or optimise monitoring and surveillance technology to protect aquatic environments from invasive species and to measure the state of our marine environment.

Biosecurity surveillance relates to monitoring the occurrence of specific events. The broader use of the tools being developed by the programme is for monitoring, mapping and assessment.

It's important because New Zealand's marine ecosystems face threats from climate change, habitat loss, land-use change and invasive species.

There is an urgent need to understand how changes in our marine environment influence the services and values

New Zealand receives from the land and oceans.

"At the moment we don't have a lot of baseline information about the current state of our marine environment, let alone the extent to which our marine ecosystems have changed," Tait said.

"But the use of remote sensing provides the broad-scale of observations that will enable us to establish a time series of data to determine what the main drivers of those changes are."

Drones

Tait presented his research on Surveillance Tools and Technologies Project to the Association of Local Government Information Management conference in Wellington where the theme was "Ignite The Future".

He spoke about NIWA's innovative use of drones for the Department of Conservation on the West Coast of the South Island, to survey rocky coasts where it was too dangerous for people to go.

"These areas are remote, exposed and difficult to access and so this is an example where drones fill the gap between satellites and ground observations."

NIWA has drones which can be mounted with multi-spectral cameras to detect an array of light wavelengths, to view the sea floor and identify marine plants. Smaller



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drones carrying standard cameras are also used for field work.

Drones are largely autonomous and can be programmed to fly an automated path to provide a detailed picture of a particular habitat. They have become accepted as a robust tool for ecological monitoring.

ROVs

Tait said ROVs are on a similar trajectory as monitoring tools for undersea environments where divers cannot reach or are too dangerous to visit.

"Satellites and drones provide enormous leaps in the coverage of marine monitoring from above but there is also a need to understand the changes that are occurring well beneath the surface of the ocean, that's why ROVs are important."

NIWA's ROV units are battery powered but tethered to the operator at the surface via a fibre optic cable.

The cable provides real time data and images, and it allows the operator to manoeuvre the ROV which is crucial when working in harbours with submerged structures.

ROVs are already being used by dive companies contracted to detect biofouling on the hulls of ships traveling international waters, to prevent marine hitchhikers establishing in new environments.

NIWA has a role in biofouling research too, focused on developing and testing novel platforms and sensors and ensuring that these instruments are fit for purpose and cost-effective.

NIWA has used ROVs under the ice in Antarctica, fitted with a grabber as a collection tool to sample organisms.

"Our ROVs have also been used at Aotea - Great Barrier Island and Mercury Island surveying for an invasive weed called Caulerpa.

"Divers have been surveying this area for one year but are limited in terms of the time they can spend in the water, especially when diving below 20 metres.

"Last time we went to Mercury Island we took the ROV down 30-plus metres, to determine whether the invasive weed was able to survive and spread and in deeper water with lower levels of light."

Artificial intelligence

Tait said NIWA is pioneering artificial intelligence and machine learning to detect invasive species automatically.

The concept is to run video from ROVs through a detector to identify invasive species, eliminating the need for people to spend hours watching the footage.



Kelp forest

Satellites launched by NASA, US Geological Society and European Space Agency have been in orbit for decades and continued to provide broad scale data for scientific use.

NIWA is making better use of this resource in the sky by developing novel algorithms to detect and map kelp forests across New Zealand, as one example, using moderate resolution satellites.

"This allows us to provide a national approach to identifying cycles of abundance, regional trends and threats to kelp ecosystems."

Kelp forests are important because they can fix and store carbon dioxide, produce oxygen, provide habitat, they are a food source for ecosystems and people.

But kelp is also vulnerable to climate change, overfishing and land-based disturbances.

Wetlands provide similar services by filtering agricultural runoff, sediments and nutrients and NIWA is also developing remote sensing techniques to map wetland habitats to provide health assessments and time series to assess change over the past couple of decades.

Tait said many agencies used satellite data, drones and ROVs but NIWA is leading the way in the application of the technology to coastal ecosystems.

"We're aligning this technology with traditional surveillance methods, so we get a crossover of the two, to provide robust survey results."

Traditional methods used to detect marine invasive species require resource intensive surveys, as well as highly specialised personnel and equipment.

Remote sensing has reduced the resources needed but Tait said people were still the key to making the most out of drones, ROVs and satellite data.

"We are still a long way off from being completely hands-free for drone operation and the critical factor is getting the greatest coverage for the least amount of human time." ●

CATCHING COVENANTS

Questioning restrictive covenants in residential subdivisions?

Devon Allen, BSurv (Hons) & Mick Strack

A covenant is a legal mechanism placed on the title of a parcel of land that either restricts or requires a landowner to do, or not do something, in relation to that land. As a registered property right, therefore, covenants are legally defensible. Covenants usually restrict a property owner from undertaking some activity on that land that would otherwise be allowed under the law. Covenants are a popular mechanism used by property developers to protect the aesthetics of residential subdivisions and to control the land use decisions of residents.

Restrictive covenants are commonly applied to titles created within large-scale residential subdivisions, and are sometimes referred to as building schemes. Building schemes are created on the basis that there is a common intention to create, and a common interest to enforce, a scheme of reciprocal rights and obligations. Most of the justifications of imposing covenants relate to the early development of a new community; developers want their subdivision to be built upon quickly and attractively in a way that enhances the desirability and urban form of the development and significantly enhances the value and profits from the land. However, once the land is fully developed, those sorts of covenants are no longer required



and, at least for administrative convenience, should be removed from the record of title. Once all allotments are sold and developed, the other proprietors of that development become the benefiting party, and the responsibility for enforcement changes.

Productivity Commission

Housing affordability is a major issue in New Zealand. Two inquiries by the New Zealand Productivity Commission demonstrate the effect that covenants have on housing affordability and availability. The 2012 *Housing Affordability* report found that construction and materials costs, slow infrastructure development, restricted land supply, and slow and costly planning and regulatory processes were major factors in housing affordability. Several of these factors can be attributed to covenants. Covenants increase the cost of housing by often having direct requirements that minimum costs or size be met, or by requiring the use of certain building techniques and materials. Covenants that prevent more than one dwelling or further subdivision of sites were also found to be problematic, as intensification is impossible because all surrounding owners have to agree to uplift the covenant.

The 2015 Productivity Commission's *Using Land for Housing* report found that private covenants can be a barrier to growth by restricting the current and future development capacity of land. The commission found covenants restricted the supply of land for housing by firstly imposing more restrictive rules than District Plans, and secondly, by preventing the redevelopment of a neighbourhood (through the construction of infill housing) that could otherwise occur. Covenants were also found to have increased the cost of housing through direct requirements that dwellings are of a minimum cost or size (larger than required by council rules); and by prohibiting efficient and innovative building techniques, including the use of building materials that may be developed in the future.

Case Law

The recent Supreme Court case *Synlait v NZIPL* [2020] NZSC 157 concerns the extinguishment of a restrictive covenant (see case commentary in S+S 104; 2021). This case is significant as it creates precedent about how the courts should approach applications for extinguishment or modification of covenants. The Supreme Court exercised discretion in this case not because it made it more convenient for Synlait



to build its factory, but because changes in circumstances had led to both the benefiting and burdened land being used in a different way from what was once expected or projected. This case demonstrates a more flexible approach to covenant modification decisions, and the balancing of considerations that the court should use in the implementation of s317 – the importance of private property rights and the contract of the covenant, as well as other considerations (like zoning and environmental changes) that allow efficient and effective use of land.

Research

Research into restrictive covenants was undertaken as part of Devon Allen's Bachelor of Surveying with Honours degree, in order to evaluate whether covenant conditions are appropriate. One objective of the research was to assess how residents comply with the covenants imposed on their titles, using detached observation. An audit of activities on land was undertaken to assess compliance. Landonline was used to extract covenant documents, and the covenants that currently burdened each property were selected and collated into a checklist. An observational audit was undertaken on properties within the selected subdivision. Properties were observed from the street frontage, and audited against each of the covenants on the checklist to determine compliance. If a property was seen to be meeting the conditions of a specific covenant, a tick was given in the box. If a property breached a specific covenant, comprehensive notes were taken detailing the breach.

A further objective of this research was to investigate the attitudes and understanding that residents have surrounding the covenants imposed on their title using participant interviews. Property occupiers were asked about their awareness of covenants on their titles, their attitudes towards the covenants, whether they had had any problems with the covenants imposed on their titles, and whether they were aware of any enforcement of covenants within that development.

Covenant types

The covenants in this subdivision included:

- building and land controls – including minimum dwelling size, prohibiting secondary dwellings, parking of caravans and prohibiting further subdivision
- cladding covenants – colour and types of cladding
- fencing covenants – height, colour and location of fences
- vegetation and landscaping covenants – prohibiting species other than introduced deciduous
- external area control covenants – prohibiting rubbish
- fire and heating covenants – prohibiting open fires
- animal control covenants – prohibiting certain species of animals

Covenant audit

The property audit observed that 45 properties breached 61 individual covenants. The covenant category that was breached most frequently involved fencing type, colour and height. This was followed by vegetation and landscaping, with seven breaches. Three breaches were due to trees that exceeded a specified height limit, and two were due to prohibited species. External area control had four breaches due to excess rubbish. Three breaches of building and land control covenants occurred due to caravans located on lots, and one breach of a cladding covenant due to unauthorised materials.

Interviews

The interviews investigated participant awareness of the covenants imposed on their titles. Many participants were made aware of the covenants imposed on their titles when they purchased their properties, and others by word of mouth. Six of the participants could talk about some of the specific covenants imposed on their titles with varying degrees of detail. Participants understood that covenants were used to restrict certain landscaping elements such as fences, house sizes, house cladding, and landscaping.

Three participants in this research believed the covenants imposed on their titles were positive. "Oh, they're probably a good thing. Got to be a wee bit of order. Just to keep control, I suppose. You don't want someone to come in and paint their house bright yellow and put 10 containers on the property or anything like that."

Two participants believed the covenants imposed were positive, but only if the conditions were reasonable, and the covenants were enforced. Two other participants acknowledged the benefits covenants had for the community overall, but talked negatively about specific covenants that restricted their private property freedoms.

One of the covenants within the subdivision prohibits caravans on lots, unless they are parked in a garage and not be seen from the road. The caravan issue was discussed by many participants. One participant expressed awareness of the caravan covenant, and their rights under the building scheme to enforce this covenant, but they did not have a problem with the presence of caravans as long as the caravan was located discreetly and was neat and tidy. The participant said, "Other residents have to be able

to live the lifestyle they want to live, and if they have a caravan, they need to be able to park it somewhere."

Benefits?

Are there any benefits that are gained with the imposition of restrictive covenants? Most residents' attitudes towards the covenants on their titles were generally positive. The protection of the aesthetics of the subdivision was a perceived benefit of the covenants, and was considered a valued private property right. However, there is ample anecdotal and proven evidence that many covenant protections are not complied with by the burdened titles, and enforcement by the benefiting proprietors is far from easy, not worth the effort, and is likely to introduce conflict into neighbourly relationships. If covenants are not being enforced, the benefit is no longer there, and the justification for their retention is gone.

The question that could now arise is: could the design aesthetics of a developed community be better imposed and protected by the District Plan and council design guidelines, which are imposed in a democratic manner rather than imposed by a profit-seeking developer? Furthermore, the perpetual condition against further subdivision and increased density undermines the authority of the territorial authority to adapt to different housing demands, and implement different policies and rules. Perhaps, as we recognise the desirability and the need for greater urban density and diversity, we need to disentangle restrictive covenants from property titles.

Recommendations

Covenants may be useful to establish an initial aesthetic of a development, but the ongoing restrictions of choice and liberty are inappropriate. It is also evident that housing affordability is affected by construction rules regarding size, materials and density, and that the benefits of greater housing diversity and choice should override developer-imposed rules.

The Productivity Commission recommended reform of covenants law. In a market that requires housing, covenants are a significant barrier to increasing house numbers and diversity, and two reform proposals were offered.

- a statutory sunset period of 25-30 years on restrictive covenants to allow the covenants to lapse when the character of an area is changing
- a reduction of the proportion of landowners required to agree to covenant changes from all to a super-majority to make it easier to remove inappropriate covenants from building schemes.

The Supreme Court suggested there was a legislative trend towards facilitating modification of covenants, and the implementation of covenant reform will allow this trend to be extended.

Implementing these two recommendations will allow for the creation of higher density infill development, and allow for innovative urban design solutions, which will aid in housing diversity, affordability, and availability in the future. If reform such as this is implemented, District Plan rules and design guidelines should be applied to properties after the sunset clause expires, to ensure positive urban design outcomes are maintained. The District Plan planning and consenting process is the more appropriate forum for managing (and where necessary changing) land use rules.

Alongside these provisions, guidance should be provided about the type of covenants that can be used by developers, and about the wording of the covenants themselves. Guidance should be provided to developers about what categories of covenants are appropriate for the character of a specific area. This guidance could be in the form of policy, such as an addition to the National Policy Statement on Urban Development, or through the development of 'design guides', like those regularly used by councils now. ●



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Adélie Penguins, Climate Change and Fisheries Management

*Dr Dean Anderson,
Manaaki Whenua – Landcare Research*

As a harbinger of change, Antarctica's Adélie penguins make the perfect subjects. They are an ice obligate species and are highly sensitive to the abundance and distribution of their primary prey – krill and fish.

Manaaki Whenua researcher Dr Dean Anderson says Adélie are a sentinel species because changes in their behaviour or population dynamics are indicative of changes in climate (which can be seen in the ice) or fishery management. Much of the Ross Sea was designated as a Marine Protected Area (MPA) in 2017, and Adélies use the entirety of the Ross Sea and the MPA through movement and migration. "If we want to be able to disentangle the effects of climate change or fisheries on their population or behaviours, we need to understand those relationships."

Adélie penguins are the most widespread birds in the Antarctic. They breed on outcrops of Antarctic rock. At Cape Bird, where Dean and his team do their research, about 80,000 birds return every year to nest and breed from around the start of summer in late October.

During the Antarctic 'summer' Dean and the team attach GPS telemetry units to the backs of breeding adult penguins. The data show how far and where the birds are travelling to feed relative to ice and prey abundance. The birds then return to the colony to feed their chicks. Abundant ice and prey lead to efficient foraging and fast growing chicks.

Following the breeding season, adult penguins and newly fledged chicks migrate north over a period of about 8 months. They can't stay at the colony over winter because it is dark 24 hours a day and the sea is frozen solid. During



Adélie penguins on sea ice, Cape Bird, Antarctica.

this period, the penguins need to fatten up and gain strength to prepare for the following breeding season. To do this they need to find 'primo Adélie luxury spots', where they have access to water, high prey abundance, ice, and daylight (they need to see to forage). This can require a round trip of 14,000 km.

To learn where the penguins migrate, Dean and the team deploy small light-reading devices on the ankles of breeding adults. The information gained provides an understanding on how climate change and fisheries may impact survival and behaviour during this critical time.

It's about establishing a relationship between the migration patterns, ice conditions, prey abundance, and sea currents, so that when change does happen it makes it possible to attribute the change to something in particular, for instance either climate change or changes in fishery practices.

The next steps in the project are to start using remote sensing to start monitoring the size of penguin breeding colonies across the Ross Sea.

"If we can use satellite images to count every year then



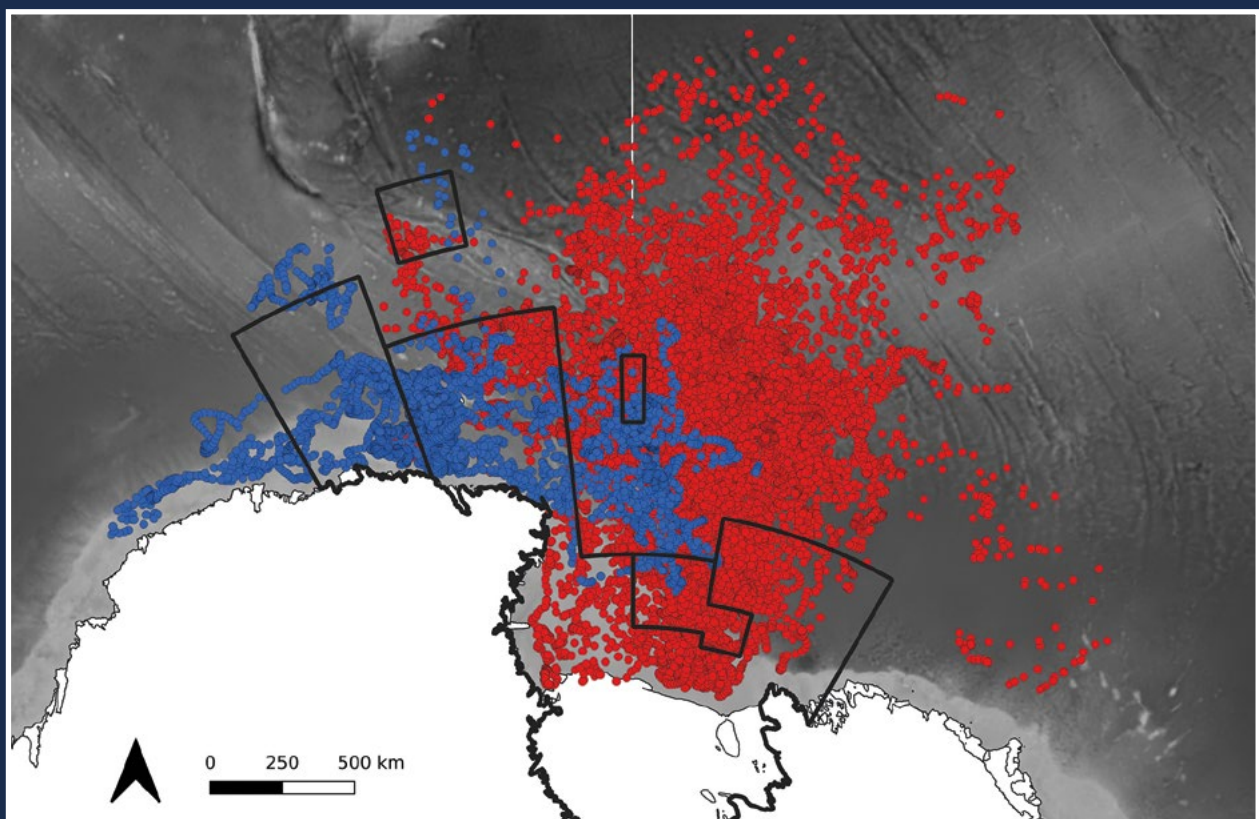
we can really monitor the annual fluctuations and relate that to changes in the larger Ross Sea," says Dean. While the satellites can't yet distinguish individual penguins, they do show up differences in the pink-coloured guano on top of grey-black rock. "We can establish a relationship between how much area is covered in guano and the number of penguins," says Dean.

Those data feed into a model that can show whether population changes are natural fluctuations or due to deviations in sea ice or prey abundance, which would be indicative of the effects of climate change or fisheries management.

Dean says 3 years of data so far have given the team a good baseline of relationships between ice conditions and fisheries practices. "The Ross Sea is in a marine protected environment, but it's only set in place for 35 years. We really need a scientific basis for making decisions on what happens to it after that."

(This article originally appeared in Pūtaiao issue 11, August 2022, the quarterly science publication of Manaaki Whenua - Landcare Research). ●

Over-winter migration location points of 53 penguins from Cape Bird, Ross Island (red) and 14 from Cape Adare, northwest Ross Sea (blue). Data were collected with light-measuring geolocators.



Showcasing Spatial Excellence

AWARD FOR COMMUNITY IMPACT (HIGHLY COMMENDED)

*Recognises unique contributions
the spatial industry has had on
people and communities*



AWARDED TO (JOINT HIGHLY
COMMENDED ENTRANTS):

*Nelson City Council's Geospatial Services
team and Climate Change team,
and Tonkin & Taylor*

This year the quality of entries was very high and, as a result, there was a winner and a highly commended entry.

The highly commended entry was a collaboration between a city council and a spatial business as part of a climate adaptation project on coastal flooding.

The council in question is developing an adaptive strategy to prepare for the impacts of climate change, and initial community engagement has focused on coastal and lower river flooding.

To support this engagement, our winners collaborated on a model for coastal and river flood risk. The model worked well for the technical specialists, however, our winners wanted to go further and communicate the risks to their communities in a way that would be easy to understand.

This led to the development of a 3D story map and static 2D print maps to support community engagement.

AWARD FOR COMMUNITY IMPACT

*Recognising unique contributions
the spatial industry has had on
people and communities*



AWARDED TO (JOINT WINNERS):

*Beca Ltd, Waipā District Council,
InPlace Ltd, Maximize Ltd
and Interactionz for Ahu Ake –
the Waipā Community Spatial Plan*

THE PROJECT: This year's winner was also the result of a collaboration on behalf of a council – this time, a North Island district council that has been experiencing strong population growth.

The work of our winners has provided a blueprint for the district for the next 30-plus years and will also provide the foundation for all future planning and investment that directly shapes the district's communities.

Our winning, diverse project team aimed to simplify storytelling and raise engagement by exploiting GIS, and deep spatial analysis helped to create five interlinked growth scenarios.

Sharing the scenarios using online StoryMaps will enable partners and community stakeholders to digitally explore their hometowns, places, think, talk, and actively contribute to making their communities flourish.

Progress over time will be measurable.

Excellence – Industry Awards

On November 3, the 2022 Spatial Excellence Award winners were announced at a special cocktail event held at the Harbourside Function Centre in Wellington. Proudly presented by S+SNZ, these awards showcase and celebrate the deserving winners who are automatically entered into the APSEA awards. Well done to all nominees and winners.

AWARD FOR ENVIRONMENT AND SUSTAINABILITY

Recognising products and projects that help to resolve any issue in an environmental context



AWARDED TO:

Ballance Agri-Nutrients

Our winner, in conjunction with a commercial partner, has been developing data science and machine learning algorithms to automatically identify environmentally sensitive geospatial zones and exclusion areas to build into their spreading plans when applying fertiliser from aircraft.

This is an example of a business providing its shareholder base with tools and techniques so they can better manage the sustainability and environmental aspects of their farms.

AWARD FOR INNOVATION MEDIUM TO LARGE BUSINESS (HIGHLY COMMENDED)

Recognising a unique delivery of a project, product or service based on a new idea, method, technology, process or application resulting in significant social, environmental and/or economic benefits



AWARDED TO:

*Woods and UAS NZ Ltd
for The Rapid Mapper*

THE PROJECT: The highly commended entry recognises an innovative new mapping system that was recently selected as the winner of the Christchurch Aerospace Challenge 2022. This challenge was established to encourage innovations in aerial imagery technology in Christchurch.

The system couples the best of drone tech with the operational flexibility of manned aircraft and its compact, fully self-contained design means it can be fitted to an aircraft quickly and fly under weather conditions that prevent traditional aircraft and satellite systems.

Showcasing Spatial Excellence

AWARD FOR INNOVATION – MEDIUM TO LARGE BUSINESS

Recognising a unique delivery of a project, product or service based on a new idea, method, technology, process, or application resulting in significant social, environmental and/or economic benefits



AWARDED TO:
BECA

THE PROJECT: The survey industry has been limited in the ability to complete measurement surveys remotely in hazardous environments. Clients are asking for measurement data in spaces that are often not safe for a surveyor to enter such as culverts, tanks, damaged buildings, and contaminated sites.

In the past 18 months, our winner designed and 3D-printed a remote-controlled robotic vehicle designed specifically to accommodate one of their 3D scanners. This provided a useful tool to conduct a measurement survey, effectively eliminating the hazards associated with a person entering a hazardous space and enabling the surveyor to remain safe.

AWARD FOR SPATIAL ENABLEMENT

Recognising products or projects in which the application of spatial information, methodology and/or tools has greatly improved the outcomes of a non-spatial project, process or product.



AWARDED TO:
New Zealand Police

THE PROJECT: Policing and community harm in New Zealand is impacted by Gangs, Drugs and Alcohol. Enabling national level spatial reporting of Gang activity, Drug usage & Alcohol Harm to deliver the data directly into a set of visually appealing user-friendly ArcGIS dashboards allows all Police users from frontline staff to desktop jockeys and strategic planners to access the information instantly and consistently, informing & improving safety across the country

Prior to the development of the National Intelligence Geospatial Platform, the location-based harm from these themes has been stored within non-spatial National Databases and accessible via non-spatial reporting mechanisms.

Science – Industry Awards

AWARD FOR TECHNICAL EXCELLENCE

Recognising products or projects in which the application of spatial information, methodology and/or tools has greatly improved the outcomes of a non-spatial project, process, or product.



AWARDED TO:

Woods

THE PROJECT: The Technical Excellence Award recognises surveying and spatial projects that apply existing technology and methodologies to an exceptionally high technical standard, overcoming significant technical challenges, and delivering outstanding results for the client.

Our winner is a land development and geospatial consultancy with a desire to continually improve outcomes for its clients through the use of technology and innovation to improve efficiency, quality and safety at scale.

With this ethos, our winner combined many survey techniques and technologies to achieve a high-accuracy survey of over 40km of the Auckland Metro rail corridor without requiring a Block of Line. With an estimated 90% reduction of time within the rail corridor compared with conventional options and zero disruption to train services, their solution delivered on safety as well as survey products.

SPECIAL AWARD – SSSI HYDROGRAPHIC EXCELLENCE AWARD

Aims to recognise hydrographic projects and fieldwork that reflect hydrographic excellence, and which deliver hydrographic best practices, either ashore or afloat. This award is open to Australian and New Zealand-based hydrographers.



AWARDED TO:

*Toitū Te Whenua LINZ
and Napier Port*

THE PROJECT: Errors in marine navigation have the potential of leading to serious and significant health and safety, environmental and economic consequences.

The New Zealand Hydrographic Authority has worked closely with Napier Port to develop a high-density electronic navigational chart that supports safe navigation in the redeveloped Napier port area.

The more detailed information provided by the high-density chart also expands the range of weather and tidal conditions in which safe navigation may be conducted. This, in turn, supports increased productivity of the port.

Individual Awards

POSTGRADUATE STUDENT AWARD FOR 2022

This award is conferred on a postgraduate student who has undertaken a research project that contributes to the ongoing progression of the surveying and spatial profession.



AWARDED TO:

Sophie Curtis-Ham

THE PROJECT: In her PhD research, this winner developed a method to leverage Police administrative data on crime and location-based activity locations to prioritise suspects in criminal investigations. This method, known as GP-SMART, or the Geographic Profiling Suspect Mapping and Ranking Technique, implements a theoretical model to predict the future activity locations of offenders, based on their past activity locations and is freely available to police analysts worldwide.

This research primarily contributes to the ongoing progression of the spatial profession by highlighting the power of spatial data held by Police to help solve crimes and through the model's broad potential application in the spatial industry.

PROFESSIONAL OF THE YEAR AWARD 2022

A practitioner who is working in any of the disciplines of surveying and spatial sciences whose professional achievements are acknowledged by peer citation as exemplifying the highest standards of excellence and ethical conduct.



AWARDED TO:

Michael Pinkerton

This year's winner of this prestigious honour is an innovator and leader within the Asia-Pacific geospatial sector.

In a 26-year career, he has applied his expertise to complex projects including Inland Rail, Auckland City Rail Link, Kaikōura earthquake recovery and industrial developments.

He strives for technical excellence and is an early adopter of new technologies. He was consulted as a subject matter expert to develop KiwiRail's spatial capture standard, considered industry leading across Australasia.

His expertise in the application of spatial data capture techniques and focus on managing risk has seen mobile laser scanning become an accepted methodology on highway projects across NZ and Australia.



Boosting Diversity and Inclusion: a Win-Win

Roshni Sharma

Tobler's First Law of Geography states: "Everything is related to everything else, but near things are more related than distant things."

As surveyors and geospatial professionals, we tend to interpret this in a geographical sense, however it applies just as much to the ways in which we work. When the groups we work in or peers we surround ourselves with are similar to us, we are subconsciously more inclined to think in similar ways... but also to miss certain other perspectives, ideas or potential ways of doing things.

For a small industry such as ours, we need now more than ever to be able to capitalise on diverse thought to facilitate innovation to access the business benefits this brings. With technological advances rapidly escalating, other industries are also increasing their ability to replicate our processes and methods, but without the deep understanding of data quality that we do – making it even more pressing for us to be able to retain our niche within the global context.

Diversity, inclusion, equity, and belonging are fundamental issues that affect the surveying and geospatial sectors across the world, in the global north and south, across country borders and at all scales – from small sole traders to multinational organisations. Diversity describes the amount of 'sameness' in the composition of a group, and within our global surveying industry, from a demo-

graphic basis, this sameness tends towards males who are on average 50 or older.

As the world has become more globalised over recent decades, an increase in access to education as well as cultural shifts in many countries have inspired more people from various cultural backgrounds, genders, etc, who might differ from the 'average' surveyor, to step into the surveying and geospatial industry. These people bring with them perspectives, knowledge and life experiences that help to create a broader, more diverse culture within our industry, including new ways of innovating and creating business benefits.

Diversity and power

There are many features that can make up a person's identity – gender, age, sexual orientation, cultural background, race, class, worldview, (dis)ability, and so on. Some of these tend to be visible (such as gender) and others invisible (such as worldview).

Additionally, the impact of these attributes may vary according to context. For example, in some situations being a young professional might place you in a context where you inherently hold greater power (such as when speaking to undergraduate students looking for tips on getting into the industry), and in other situations you might hold less power (for example, sitting in a meeting room with many



experienced colleagues and clients).

The third aspect of diversity as linked to power is that these dynamics can occur at three different levels – inter-personal, institutional and systemic. Institutional power imbalances spread within an organisational culture, influencing the norms for treating people in different ways based on their different identities. Systemic power imbalances occur across countries and generations.

These matter because the world we live, work and play in is a social one, and social structures contain social dynamics. Within the workplace, these manifest as unconscious undercurrents of access to opportunity, recognition and fair treatment through power (the level of access to influence or control over others) and privilege – the experience of having access to power as a result of our identity, which provides us with benefits or rights that others may not have as a result of their identity.

The leaky pipeline

The concept of the 'leaky pipeline' tells us that diversity is not the whole story. We need to develop inclusion on an industry-wide level if we want to retain those coming into the industry, and attract more people as school-leavers or from other industries.

Picture 100 girls in primary school. They hear subconscious societal messages that science, technology, engineering, mathematics, and medicine jobs are more for men rather than women. During subject selection in high school, the weight of these subconscious societal messages impacts their subject choices, influencing their choices after finishing school.

After school, 10 girls are studying at TAFE (polytechnic) and 70 at university. At TAFE, only two women are studying STEM-related courses and only one is doing surveying. At university, only 30 are doing STEM-related courses, with five related to surveying and geospatial. Upon graduation, we have one completing her TAFE qualification and three graduating university within surveying and geospatial. The other two have transferred out of the degree they started in.

As these four women start working in geospatial, we find that within the first 10 years of their career, two of them transition into careers in other fields, finding the workplace too isolating for them. The remaining two women are thriving in their careers, however both experience challenges in receiving similar opportunities compared with their male counterparts, and neither have ever received the same salary as their male counterparts, despite holding similar or senior positions.

One of these women chooses to start a family with her partner, and finds it challenging to return to work after maternity leave without the flexibility to take on the caring responsibilities that come with being a mother, alongside caring for her and her partner's elderly parents. She experiences discrimination and micro-aggressions from her colleagues, and is never able to make it to the management-level position for which she once held aspirations. The other woman is able to gain a position on the executive of an organisation, and finds herself making a positive impact on the industry she loves. Despite this, she still experiences a lower salary compared with other men at her level.

This story illustrates the leaky pipeline in a simplified way, not considering other visible or invisible aspects of diversity. It does, however, start to show us how the compounded effects of a lack of diversity translating into inclusion affects our industry's workforce. This is of concern as we consider how to retain talent and are able to grow as an industry within the global context.

Business benefits

Drucker's famous statement, "Culture eats strategy for breakfast" highlights that the quality of your workplace culture can elevate your business outcomes much more powerfully than your strategic planning.

Having diversity within your workforce or team does not automatically bring benefits. Sometimes, it just creates more friction or greater staff turnover. For diversity to translate into business benefits, it requires the culture of your team or workplace to embrace inclusion to create a sense of belonging. Inclusion is a less easily measured feature than diversity, and refers to a person's experience within the culture of an organisation, industry or other group. As Verna Myers is often quoted as explaining: "Diversity is being invited to the party, inclusion is being asked to dance, and belonging is dancing like no one is watching."

Signs of a diverse, inclusive culture include:

- Better decision making through a variety of perspectives, giving rise to robust, respectful discussions

- Greater ideation and debate, leading to thought leadership
- A culture of belonging, leading to higher employee engagement and greater retention of talent
- Greater levels of innovation as a result of psychological safety allowing for failing fast, making mistakes and learning from them, and the ability to try new things together
- Making better decisions, faster, leading to increased profits and business results
- Increased organisational brand due to healthier and safer culture, attracting top talent more effectively
- Stronger ability to respond well to disruptions.

The Gartner Inclusion Index identifies seven statements on inclusion – the more that employees agree with these, the higher the level of inclusion in a workforce:

- Fair treatment: Employees at my organisation who help the organisation achieve its strategic objectives are rewarded and recognised fairly
- Integrating differences: Employees at my organisation respect and value each other's opinions
- Decision making: Members of my team fairly consider ideas and suggestions offered by other team members
- Psychological safety: I feel welcome to express my true feelings at work
- Trust: Communication we receive from the organisation is honest and open
- Belonging: People in my organisation care about me
- Diversity: Managers at my organisation are as diverse as the broader workforce.

Four ways to create greater inclusivity in your culture, as outlined in greater detail in the Harvard Business Review article: "How to measure inclusion in the workplace" (May 2021), are:

1. **Listening** – Hearing from the people who experience exclusion or marginalisation (formally through focus groups or anonymous surveys, or informally) can provide insights into where gaps in inclusion or diversity might lie in the recruitment process, development and recognition process, leadership, and culture. These insights can be used to create a plan for change.
2. **Self-reflection** – Culture trickles down from the top, so creating space and accountability for executive and management to reflect upon their leadership behaviours (conscious and unconscious) can contribute towards positive changes in supporting team

performance and growth, fostering accountability, conflict resolution, communication, and showcasing integrity.

3. **Vigilance** – Through leaders at various levels within an organisation maintaining vigilance in calling out unacceptable behaviours, and setting the standards for what inclusion and belonging can look like. Calling out micro-aggressions (unconscious but still damaging comments or attitudes around gender, race, etc), micro-assaults (discriminatory remarks), micro-insults (demeaning remarks), micro-invalidations (dismissive remarks) and other micro-inequity can hold the employee body to account and shape a culture that's more welcoming and psychologically safe for all employees of all backgrounds and identities.
4. **Process changes** – Leaders within an organisation are in contact with diverse groups across the business, enabling them to propose and implement process changes that promote inclusion and belonging.

So I pass over now to you, dear reader. I invite you to reflect over a cuppa. How will you try to be aware of your unconscious biases and blind spots? What might be some ways you could influence your workplace culture towards greater inclusivity? How can you help others in our incredible industry to feel a greater sense of belonging and help stem that leaky pipeline?

With a background in environmental science and management, human geography, palaeoclimatology and business, [Roshni Sharma](#) is a graduate of the Homeward Bound Women in STEMM leadership program, facilitator of the Locate Hub, and Convenor of the [Space, Spatial and Surveying Diversity Leaders Network \(SSS-DLN\)](#). At FrontierSI, Sharma is making it her life's work to harness location intelligence to create tangible, positive change for society.

This article was first published in the [Feb/Mar 2022 issue of Position magazine](#) ●



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BLINDSIDED BY RESIGNATIONS?

Stay Interviews could be what you're missing

Eighty4 Recruitment and Managing Director Mark Fisher

You've probably heard the buzzwords 'the great resignation' thrown around a lot in the past year, and with Kiwi research showing that two in five employees are planning to jump ship within the next year, it's no surprise that New Zealand companies are scrambling to keep their employees satisfied.

What you might not know, is that getting on top of your staff retention doesn't usually come down to whether or not you offer beers on a Friday and or a staffroom pool table (though these perks are nice to have). More often than not, it's about building trusting relationships and two-way communication between your leadership team and your employees.

If our office perks or competitive salary package aren't enough to keep people around, then what is?", we hear you asking. There's no denying these things are an important part of the happy employee ecosystem, but what you might not yet have tried is conducting stay interviews.

Eighty4 Recruitment asked Managing Director Mark Fisher about the ins and outs of a good stay interview.

What is a stay interview?

"Typically as a manager, you'd interview your employees at two key points of their journey in your team: their initial job interview and their exit interview. The touchpoints you may be missing along the way are 'stay interviews'. These

are (usually) bi-annual catch-ups, formal or informal, where you sit down and get a read of your employee's satisfaction."

People do stay interviews in different ways, but basically, it's a conversation to truly understand what your employee values most about working within your organisation. The goal is to understand what they value most, how things can be improved and ultimately ascertain the likelihood of them leaving.

"It's important to hold your stay interviews at least every six months to keep your finger on the pulse of how your team is feeling. You can include the conversation in chats you're already having and approach them informally, or make it a formal chat on its own. Whichever way you choose to go about it, it should give your employees a chance to comfortably express what they're loving and what they're not."

Stay proactive, not reactive

One of the most common things we hear from businesses is that they feel blindsided when their star employees hand in their resignations. The natural next step when this happens is to quickly counteroffer, or attempt to explain away some of the pain points your employees are experiencing.

Unfortunately, once your key players have one foot out the door, it's too little too late – that's why it's so important

“... there’s a lot of assumption that happens in businesses. Leadership assumes the team loves the company’s perks and they’re happy in their roles, and employees can make assumptions about things like the limitations of their role or earning potential. No one actually asks the questions.”

to work on your employee retention proactively rather than reactively.

“What we’ve seen is that there’s a lot of assumption that happens in businesses. Leadership assumes the team loves the company’s perks and they’re happy in their roles, and employees can make assumptions about things like the limitations of their role or earning potential. No one actually asks the questions,” Mark says.

That’s why stay interviews are such a great proactive measure. It’s about building trust, creating a high engagement environment and asking the right questions before frustrations build – which is what inevitably leads to people leaving.

“Often your quiet employees are your best employees, but they’re also often the most undervalued. The squeaky wheel gets the oil, but sometimes if you’re not checking in on everyone, the wheels can fall off without you realising it.”

Who should hold stay interviews?

Another common assumption is that meetings like this need to be held between a manager and an employee, but as Mark describes, that’s not always the case.

“From a leadership point of view, I think it can be anyone [holding the meeting]. With your key people, you may want someone a little more senior like a manager, but as long as the space for the conversation is created and employees feel comfortable to speak up, any conversation is better than none.”

The main thing to look out for is that you’re not cornering people into having conversations where they don’t feel comfortable, Mark says.

“For example, managers often ask people for their ideas in a group scenario or bring up problems in board meetings. But that’s not enough and people won’t speak up. It needs to be a one-on-one space where people can truly say how they feel.”

What questions should you ask?

While a stay interview is a two-way conversation, it really is about extracting what people value.

“A lot of people are designing employee value propositions, without engaging with the team about what they actually value. If you’re going to design improvements

to people’s working lives, it should be coming from the employees, and that starts with asking questions.”

“But what are the ‘right’ questions? Here’s what we’d suggest, to get you started:

- Do you feel supported in your role?
- Are the benefits we provide of value to you?
- What have you learnt in the last six months? (If they feel as though they haven’t grown - what can we do to help?
- Do you enjoy our company culture and what could we do better?
- Are you getting enough flexibility for work-life balance?
- Do you feel like you’re in the right role?
- Where would you like to go next in (or beyond) your role?”

You’ve asked the right questions, now what?

Like everything, it’s all very well getting the feedback, but if you don’t act on it there’s no point in asking in the first place. It’s key to make sure you show integrity and follow-through, which relies on having a solid process for delivery.

“We use Google Sheets or a live document that’s accessible to collate our feedback and communicate the key messages to people that can make the changes. This is really helpful, as since we’re following up regularly, we can track what we said we’d do versus what we’ve actually done.”

In short: document it, then do it. It can be a challenging feat, but one that’s rewarding for the employer and the employee. As Mark sums it up:

“Some companies don’t like to open the can of worms and ask for feedback, but if you’re brave enough to ask and have a thick enough skin to hear the negatives, you’ll only end up with positives – usually in the form of staff retention.”

If you have any questions about staff retention and how stay interviews can help, don’t hesitate to [get in touch with Eighty4 Recruitment](#). We’re happy to help. ●

RMA Reform creates opportunities for existing Unit Title developments

Stephanie Harris & Vicki Toan, Glaister Ennor

The Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 (**Housing Supply Act**) amended the Resource Management Act 1991 (**RMA**) and the National Policy Statement on Urban Development 2020 (**NPS UD**) to enable greater levels of residential intensification in urban areas in New Zealand's largest and fastest growing urban centres. The Housing Supply Act builds on earlier central government-mandated compulsory urban intensification in the NPS UD. On implementation, greater levels of urban development will be permitted in and around city centres, metropolitan centres, and existing or planned rapid transit stops, and residential zones.

The Ministry for the Environment states that the purpose of the Housing Supply Act is to bring forward and strengthen the NPS UD to help increase housing supply in urban areas, where it is needed the most. The means by which housing supply is to be increased is through intensification and densification of existing urban areas, rather than an expansion or creation of new urban areas. The Housing Supply Act and NPS UD do this by requiring territorial authorities in Auckland, Waikato, Bay of Plenty, Wellington, and Canterbury to change their district plans to:

- include the medium density residential standards (**MDRS**) as permitted activity standards in relevant residential zones;
- enable building heights and density of urban form to realise as much development capacity as

possible in city centre zones;

- permit buildings of six-storeys or more (for commercial or residential activities) in and around city centres, metropolitan centres, and existing or planned rapid transit stops;
- enable building heights and densities of urban form commensurate with the level of commercial activity and community services in and around neighbourhood centre zones, local centre zones, and town centre zones; and
- remove car parking minimums.

As at October 2020, all territorial authorities required to change their district plans have now notified intensification plan instruments (plan changes using an intensification streamlined planning process) apart from Christchurch City Council. Some of the changes to existing objectives, policies and rules have immediate legal effect and are therefore in force now.

Existing unit title developments are not typically thought of as having the ability to (further) intensify, but the Housing Supply Act and NPS UD have created opportunities for existing unit title developments to exploit surplus common property and airspace. Depending on the layout and structure of the existing unit title development, the body corporate could potentially:

- create one or more additional principal units on common property as a result of changes to minimum car parking requirements and bulk and location standards;



- create one or more additional principal units within common property airspace above the existing building as a result of increased maximum height limits; or
- sell surplus common property for development purposes as a result of changes to minimum lot sizes, car parking requirements, and coverage standards.

These opportunities could be used to:

- allow unit owners to take advantage of the increased development potential of the common property and realise the value of the common property; or
- raise funds to cover other costs including the costs of remedial or life cycle works.

To take advantage of these opportunities, a body corporate would require subdivision consent, and the necessary special resolution(s) passed at a general meeting of the body corporate. Expert input from a surveyor, valuer and lawyer are essential. Planning and urban design/architectural advice may also be required depending on the scope of the proposal.

Glaister Ennor is well placed to assist you in navigating the above opportunities. Please contact Stephanie Harris or Vicki Toan for more information. •

Property Addressing for In-fill Developments



Anselm Haanen, Surveyor-General / Kairūri Matua



Surveyor-General Anselm Haanen

Ensuring that individual properties can be readily and unambiguously identified and located is vital for the delivery of goods and services, but in an emergency, it can mean the difference between life and death. The allocation of addresses to newly developed properties is an important part of the subdivision process and is essential to any development's ultimate success.

In the past, the allocation of property addresses for in-fill developments has sometimes required extra consideration by surveyors, developers and landowners.

The Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 is likely to see an increase in housing density, and associated addressing issues. Therefore a reminder about the *Guidelines for Addressing In-fill Developments* seems timely. These guidelines were published by the Surveyor-General in 2019 to help avoid addressing problems for in-fill developments.

Addressing issues can arise when:

- adding dwellings to a large lot
- internally subdividing a single dwelling
- converting a single-purpose building into multiple apartments
- extending a road to add more properties.

Territorial authorities, which control the allocation of addresses, use the *Australian/New Zealand Standard for Rural and Urban Addressing AS/NZS 4819:2011* ('Standard') to ensure that addresses are allocated in a consistent and sensible way. Councils can also refer to the *Guidelines for Addressing In-fill Developments* for guidance and options for addressing in-fill developments.

Full compliance with the Standard when allocating addresses for in-fill developments can require changes to the addresses of existing properties, and can include road naming. This has caused significant concern for developers and property owners – especially when the latter are not directly associated with the development.

The *Guidelines for Addressing In-fill Developments* provide additional guidance and options for addressing these developments without compromising the overall integrity and use of the addressing and road naming system. The guidelines relate specifically to in-fill developments and complement the Standard. The provisions in the document vary from the Standard in several key areas, to deal with the issues that people have already been experiencing.

By following the guidelines, surveyors and developers can help ensure that developments comply with territorial authority requirements and avoid potential delays at the end of the development process. The guidelines will also help developers better understand the background to addressing and the requirements when numbers are being allocated.

Using these guidelines should avoid, or at least minimise, the need for renaming roads or renumbering properties in the future, while still ensuring that addresses enable properties to be easily identified, located and accessed. Having high-quality addresses from the start reduces the likelihood of problems when further in-fill development occurs in the future.

As well as issuing these guidelines, the Surveyor-General has enabled the Principal Unit numbers in a Cadastral Survey Dataset to be better aligned with the units' addresses. The Rules for Cadastral Survey 2021 allow the identifier for a unit to be a letter followed by a number (eg, Principal Unit G02). In many cases this will allow the sub-address number and the Principal Unit number to be the same; although not in all cases.

The guidelines are available to download free of charge on the LINZ website: <http://www.linz.govt.nz/regulatory/01245> ●

New Utility Location Standard released



The Surveyor-General has released a new national standard for recording the position of utility assets, which is now available from the [LINZ website](#). The Utility Location Standard is an important step change for recording the location of utility assets, regardless of whether they are subsurface or above ground. The Standard is intended to provide consistency and confidence in the positional information of a diverse range of utility assets – including electricity, gas, fuel, water infrastructure, and telecommunications.

Modernising the management of utility assets

The Utility Location Standard provides a new framework that defines the position of utility assets in terms of the geodetic control network in the same way as almost all other spatial data.

The Standard requires all positions to be defined in three dimensions, recognising the demand for 3D data – for Smart Cities, Digital Twins, Building Information Modelling, City Modelling, or the 3D Cadastre.

It requires positions to be defined in terms of the NZ Transverse Mercator

2000 (NZTM2000) projection and NZ Vertical Datum 2016 (NZVD2016). The Standard also specifies accuracy classes.

Benefits

This is a national standard that can be applied locally and will enable assets to be managed on a national basis in a consistent way. It is intended to provide positions that are sufficiently accurate for future needs.

The Standard will enable data on asset locations to be accurately recorded and consistently managed. It also has the potential to prevent significant harm and save millions of dollars by helping to:

- avoid collisions or damage from civil works that disrupt services or endanger consumers
- reduce the frequency and expense of utility damage
- support maintenance or repairs of assets
- facilitate comprehensive spatial planning for land use, infrastructure and environmental protection.

Defining the position of utility assets in terms of the Standard will make it possible to integrate

and overlay the information with a wide range of spatial datasets to determine their positions in relation to one another. This includes not only other utility information but property boundaries and aerial imagery.

Consistency and confidence in the positional information is of significant benefit when planning and designing the location of assets; and for relocating and maintaining them.

Use of the Standard

Surveyors should use the Standard when collecting information about the location of utility assets, such as when preparing an 'as-built' record.

It is not mandatory to use this standard. Utility organisations and asset managers are being encouraged to require the Standard to be used to record the location of new utility assets; and existing assets as they are serviced.

The Standard does not require existing records of utility assets to be re-surveyed, as this would come at significant expense.

Availability of the Standard

The Standard is available free from the [LINZ website](#). ●

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NEW S+SNZ PRESIDENT ELECTED!



In early November Survey and Spatial NZ was delighted to welcome new President, Andrew Perry to the Council. Andrew, who is Principal, Land Infrastructure at Aurecon, is based in Tauranga and has had a long association with us. We have benefited from Andrew's involvement since he

was a student member while at university, a Wellington Branch executive member, and a founding member and President of the Young Professionals Group. Since moving to Tauranga, Andrew has been an executive member of the Rotorua/Bay of Plenty Branch and was appointed Branch Chair in 2017, a position he held until March 2021. He was elected to the S+SNZ Council in January 2020 and has served on Council through to appointment as Vice President, and most recently, President. Andrew says, "I look forward to serving our members over the next couple of years as President and carrying on the great work led by our outgoing President Dr Kat Salm." Andrew replaces Kat who has stepped down as President after a three-year tenure.

CADASTRAL STREAM NEWS

Hannah Reader, Chair

Over July 2021-June 2022, the Cadastral Stream has focused on several different topics. With the Cadastral Survey Rules 2021 transitioning into force over this period, we worked with LINZ to ensure that members were able to transition to the new rules with as much access to support as possible. Over the first half of 2022, Q&A sessions were held with many of the local branches throughout the country.

The group was very pleased to welcome Sheldon McGuire and G  nevi  re Abrey from the Emerging Leaders program to the Cadastral Stream committee; and a new initiative called the Graduate Surveyor Cadastral Education Program has been introduced, with these two instrumental in getting it up and running. This will help provide direction and guidance to new graduates starting out on their working careers.

Apart from our yearly focus on conference and awards, we also have been looking at how we can better communicate with members. This is a work in progress, and any feedback on preferred communication methods from the stream members, and what people would like to hear about, would be appreciated. Cadastral Corner

has also been a regular topic of discussion, and over the year we worked on improving how this was presented and ensuring that previous articles were still available for members to reference.

Members of the leadership team remain Toni Hill, Trent Gulliver, Richard Hemi, Rita Clark, Matt Ryder and Andrew Blackman. The Council representative remains Karl Wilton, and the Chair remains Hannah Reader. As mentioned previously, we extend a warm welcome to Sheldon McGuire and G  nevi  re Abrey.

HYDROGRAPHIC STREAM UPDATE

Stuart Caie, Hydrography Stream Chair

A few of the stream's members have attended various conferences over the past months. Simon Ironside, Chair of the FIG Commission 4 [Working Group 4.3](#), attended the 27th FIG Congress held in Warsaw, Poland from September 11 to 15. Simon is keen to see the Hydro and Spatial Streams join the work of the WG to "map the plastic in our own backyard, the Pacific region" and seek government funding for a pilot UAV plastics survey in a 'hot spot' area. Simon's report from the Congress is included in the S+SNZ [Annual Report](#).

The NZ Marine Sciences Society (NZMSS) and NZ Coastal Society (NZCS) both had conferences in Auckland in late November. Frankie Robb, Billie Jennings and Mick Strack, from Otago University, displayed a poster of their work at NZCS, highlighting the Frankie's final year project: "An investigation into inconsistencies between the New Zealand coastline, and coastal property boundaries", and Billie's: "Kennedy Point Marina: A case study about the construction and the concerns caused by this project".

Emily Tidey and Hannah Mello, also from Otago, presented at both conferences on "Maximising data: using existing hydrographic surveys to better understand our coastal areas and plan fieldwork". The NZMSS theme was Wait   Wait   after the two Matariki stars connected to fresh water and the ocean as the NZ Freshwater Sciences Society joined this meeting too.

As previously reported, Toit   Te Whenua LINZ worked with Napier Port to successfully develop a next generation high-density Electronic Navigational Chart or hdENC to support the ports multimillion dollar '6 Wharf' development. This resulted in the release of New Zealand's first official hdENC.

This project was recognised at this year's Spatial Excellence Awards, receiving the SSSI Award for Hydrographic Excellence, a new category for NZ this year. The award was



From left: Dave Field, Marvin Espino and Matthew June presented by Dave Field (SSSI Awards Panel) to Marvin Espino (LINZ Senior Nautical Cartographer) and Matthew June (Port of Napier, GIS Technician). Congratulations to all involved in this project and we look forward to seeing you on the stage at the APSEAs.

SATELLITES REVEAL NEW ZEALAND'S COASTAL HEALTH

NIWA

For the first time, satellites have been used to track coastal water health around Aotearoa New Zealand.

In a new report commissioned by the Department of Conservation (DOC), NIWA analysed satellite images to measure changes in suspended sediment – or total suspended solids (TSS) – in our coastal waters.

TSS contains a variety of material, such as mud and silt, microalgae and their breakdown products. High concentrations of TSS can cause problems for estuaries, coasts and oceans, and aquatic life.

By looking at nearly 20 years of monthly satellite images of NZ's coasts, scientists found varied trends in TSS over time across the country, with generally increasing concentrations around the South Island and decreasing concentrations around the North Island.

High TSS can affect the ability of marine life to catch food, blocks light from reaching underwater plants, and is associated with elevated levels of pathogens, nutrients and pollutants.

DOC Technical Advisor Helen Kettles says that too much sediment reaching coastal waters is a serious threat to marine life.

"This research helps us to understand which coastal areas are likely to benefit from improved conservation effort and track how conditions change with time," she says. "It is good to know more about how useful satellite monitoring for water clarity will be into the future."

NIWA Principal Scientist for Remote Sensing Dr Matt Pinkerton said these trends are driven by a combination of factors.

"We suspect that changes in phytoplankton across the New Zealand shelf because of climate variability and change, the effects of waves and coastal storms on coastal erosion and resuspension

of seabed sediment, and changes to land use are all influencing these broad-scale trends. On a smaller level, what's happening in catchments and in rivers is affecting downstream water clarity in estuaries and on the coast," said Dr Pinkerton.

"Because of the damage TSS can cause at high concentrations, there is concern about the ecological and environmental effects of it on our coastal marine area. This is particularly pertinent because of the severe winter weather we just experienced – steady rainfall doesn't necessarily impact the concentration of sediment in our oceans, but huge storms like the one the South Island experienced in August can have a big knock-on effect," said Dr Pinkerton.

The team used NASA's Aqua MODIS satellite, which images the entire Earth's surface every one to two days. The data is free to use and has been used to study a wide range of topics, including glacier surface elevation and even Iberian wolf pack size. In Aotearoa New Zealand, it has been used to monitor changes in ocean primary productivity for environmental reporting.

NIWA's report details 15 recommendations to improve the value of satellite remote sensing over the next five years. These include the continued use of satellite data alongside in situ sampling and modelling to develop the best insights and management of coastal suspended sediment in the future.

For more information: www.doc.govt.nz/monitoring-suspended-sediment ●

Learning about land and environment

Richard Hemi

The current publication theme of land and environment is very fitting for the School of Surveying heading into 2023 as we are about to introduce a new paper into the first year of study – SURV130 People, Place and the Built Environment. The paper is one of the outcomes from our recent curriculum review and will now form one of our two, first-year introduction papers for students enrolled in the Bachelor of Surveying, and BScs in Land Planning and Development and Surveying Measurement.

While some of the content of this new paper is reshuffled from some former BSurv papers, it will introduce the connection between people and land earlier in the teaching than previously, and in doing so it sets out to highlight the importance of this relationship. The paper will include some foundation learning objectives critical to the following years of study, such as:

- Appreciating Māori values and attitudes to land and investigating the meaning, significance, relevance, and effects of the Treaty of Waitangi.
- Being able to identify the main elements of sustainability and the science of climate change.
- An ability to undertake a sustainability assessment of a land development project.
- Understanding engineering systems that support the built environment.

At the same time this paper aims to foster the broader graduate attributes of critical thinking, cultural understanding, environmental literacy,

interdisciplinary perspective among others. This change certainly should enhance students learning later in their courses but will also emphasise the importance of understanding the effects of land development on people, neighbourhood, cultures and the environment.

This seems appropriate in light of future professional expectations of graduates in seeking professional qualifications. Both the Cadastral Licensing Board's licensing standards, and S+SNZ's new Land Development Engineering Certification competencies require applicants to possess competency in land development engineering principles, as well as an ability to understand about the provision of safe, stable and sustainable land development.

Some of the core learning objectives also reflect the importance of understanding Māori values and attitudes to land in Aotearoa/NZ. As one of the fundamental professions in the land economy, the surveying industry has a critical role to play in the comprehension and consideration of cultural values with respect to the use and enjoyment of whenua.

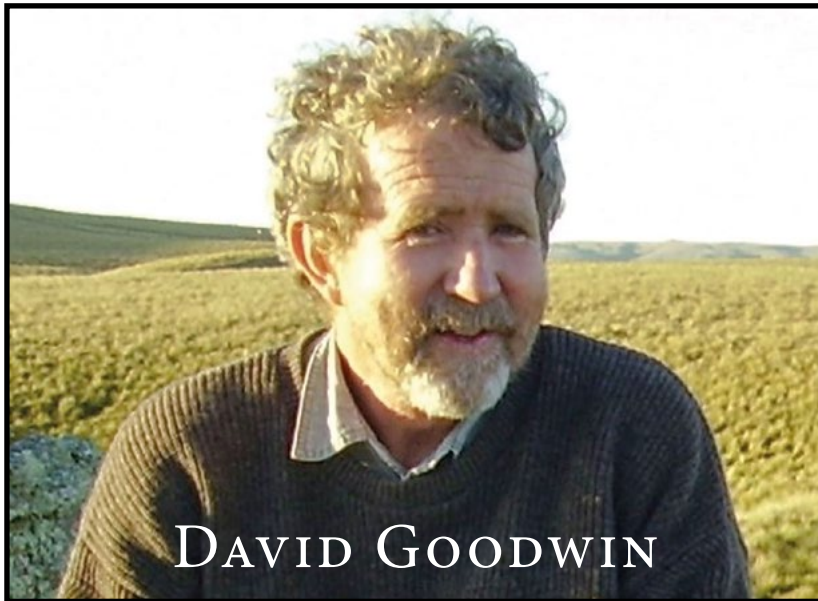
Our industry not only needs to understand these values but should strive to lead and build relationships in this area. The School also has a desire to have this connection better reflected in the student body in terms of Māori student numbers.

While new students often come in the first year of study expecting a lot of mathematics and surveying measurement teaching, some are surprised to discover there are other design and literacy expectations,



typically required in the learning about land and the environment. The BSurv and BSc in Land Planning and Development courses both contain a significant number of papers in the subjects of engineering, planning, tenure and urban design, and some students really excel in these areas. This was recently highlighted by the final assignment outputs from Urban Design 2, a final-year paper taught by Dr James Berghan. The students were required to explore urban themes including public transport, micro-mobility, water-sensitive urban design, indigenous urbanism, mode shift, or healthy streets and produce a detailed design concept.

The class recently held an end-of-year gallery where the project posters were exhibited to the whole School and the students were encouraged to share and discuss their work. As the example shown below in a poster by final-year student Joe Reed demonstrates, providing students with an in-depth theoretical knowledge of the relationships between people, land, and the natural and built environment prepares them well for an important element of their professional work to come. •



David Pell Goodwin died peacefully in his sleep on August 28, 2022. David was first and foremost a family man. He loved his family – his wife Dianne and four daughters: Ruth, Beth, Philippa, and Laura, and he was excited to watch the next generation developing. David also had a deep faith which sustained him through life. His family now take comfort from the same faith.

David was born in Bulawayo in 1958 (then Southern Rhodesia) and grew up there. He had an adventurous childhood, learning about the land and environment. He regularly explored and camped throughout the African bush with his brothers where he developed his practical survival skills including bushcraft and navigation, and came to know and love the stars of the southern skies.

David gained a BSc (Hons) from the University of Cape Town in 1982 and MSc (Distinction) from the Polytech of East London in 1989. He registered as a surveyor in Zimbabwe in 1984. He was an active member of the Surveyors Institute of Zimbabwe and on the education and publishing committees through the 1990s.

He worked as a cadastral and engineering surveyor in Bulawayo, developed a couple of consultancy

businesses and took up a lecturing post at the University of Zimbabwe Department of Geoinformatics from 1986 till 2003. While David was a keen adopter of new technologies like satellite navigation systems, he remained a firm believer and advocate for first principles surveying and especially astronomical surveying – to be able to locate yourself by stellar observations.

David uprooted his life and family from Zimbabwe to Dunedin in 2003 at a time when houses could not be sold for their value, and salaries were insignificant next to the economy's inflation. However, he worked hard on his new home and new community and with his family settled into a different life. He quickly connected with his church community and others: writers, poets, music-makers.

David joined the School of Surveying to undertake his PhD in 2004 entitled *Belonging knows no boundaries: Persisting land tenure custom for Shona, Ndebele and Ngāi Tahu*. This research drew upon fieldwork with southern African tenure arrangements, but also required significant work to understand tikanga Māori. He graduated in 2008.

In 2008, David began as a full-time lecturer at Te Kura Kairūri, the School

of Surveying, where he developed the advanced land tenure paper with a focus on international tenures alongside his teaching of surveying methods. He developed a strong reputation as a tenure expert and attracted numerous graduate researchers under his supervision, including four successful PhDs.

David's academic writing was diverse and interesting. Much was about African and informal land tenure arrangements, and much also about Polynesian land relationships and navigation, including detailed analysis of the changes in relative position of the stars which may have affected early Polynesian navigating.

He enjoyed collaborating and he published many articles with other academic staff and with his research students. David maintained his commitment to surveying education in Africa, working with colleagues there on innovative hybrid teaching models.

As a work colleague; a teacher and researcher at the School of Surveying he was a kind and generous spirit; always providing thoughtful comment and encouragement. To the young researchers he supervised and mentored, he was enthusiastic and encouraging, he was meticulous in research methods and in editing theses into well-structured prose.

And to undergraduate students, he was a great guide and example of the connections between the science of surveying and the legal, personal and communal aspects of land administration.

David loved writing, including concise and precise academic writing on the one hand and creative writing in prose and verse on the other. He was widely read, and perhaps a significant early influence was Arthur Ransom. He wrote about the map-making and the experience of place that Ransom

(continued p 40)

Update on the new Archie Bogle book

In the Survey+Spatial September edition, The Bogle Reprint Committee announced details on a new publication on the life and career of Archie Bogle. The Committee now have a further update on the publication progress of this fascinating book with copies expected to be available in March 2023.

"THE MEASURE OF THE MAN - The Life of Archie Bogle CBE, FNZIS, Surveyor of the Century," has now been decided as the title of the book and the publication will consist of three parts. Part I will be a reprint of Archie's book *"Links in the Chain"*. Part II is a short biography, titled *"Surveyor Extraordinaire"*, and Part III is a selection of articles by or about Archie: *"The Best of Bogle"*.

A foreword written by Bill Robertson ONZM, a former Surveyor General and Director General of Lands, provides an excellent opening to this story of an exceptional surveyor and one of New Zealand's most highly regarded sons. The book is dedicated to Archie and inspired by the 50th anniversary of his death.

The book will be available as a high quality hard back of 320 pages, a colourful and attractive design, compact at 258mm H x 195mm W (smaller than A4), suitable as a display reference item on any professional office reception table or coffee table setting.

Our publisher is now completing the text in full colour including over 60 photographs, plans and illustrations before sending to the printer by the end of the year. The printing, notwithstanding the delay, will be offshore to assist with quality and cost.

This project is the result of a partnership between a self-appointed committee of surveyors, the Kairuri Community Trust and Survey + Spatial NZ. All proceeds from the book go towards the Trust.

The book is a very good read, full of Archie's humour, erudite wisdom and undoubtedly with words, following his journey from his early days as one of the last pioneer surveyors to President of the Institute (twice) and its representative on the Survey Board, the Town- Planning Board and the Geographical Board to record a few of his services to the Institute, not to mention his three decades as editor of the Journal. It also recounts the incredible esteem in which he was held by his fellow surveyors.

For an individual copy, the book is tentatively priced at \$40 including GST (excluding packing and postage). Bulk purchases will receive a discount. The new book will be of high quality and our publishers estimate the retail value to be around \$70. Order forms will be available in next edition of *Survey+Spatial*.

The Bogle Reprint Committee (Gordon Andreassend, Andrew Blackman, and Don McKay. •



This photo is a mock-up of the book's front cover showing a young Archie taking triangulation observations for his 1905 practical qualifying exams. Over the next 67 years he added significantly to his surveyors' professional qualifications, experience and reputation.

(David Goodwin – continued from p 39)

incorporated in his work in several academic journals and presentations.

Several of his unpublished novels include visual imagery and a focus on a sense of place. These novels drew on his childhood experiences as well as his relationship with places, the history and the land of Zimbabwe. His words and hand-drawn pictures of the land are beautifully crafted and his plots draw on his surveying knowledge, with GPS being used to find and record historical locations.

This creative writing was chal-

lenging, but David was enjoying the challenge and had been very much looking forward to being able to dedicate more time to such writing and to poetry. His phased retirement was providing some additional time, but full retirement from his academic position was eagerly awaited. It is with considerable sadness that that dream was cut short so suddenly.

David was also an enthusiastic musician and he and Dianne organised several musical soirees at their home where all were involved with the intricate dance of music, poetry

and food, all good for the soul. David would bring his guitar on departmental writing retreats, and regularly led the School of Surveying waiata at graduation.

"David savoured life and lived out the wholeness and wonder of each moment. He loved well and lived well looking always to his Lord." David is survived by his mother Cynthia, his wife, Dianne, by his four daughters (two having returned to Zimbabwe) and three grandchildren. •



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