PUSHING THE BOUNDARIES: APAS2024 CONFERENCE

The Association of Public Authority Surveyors NSW (APAS) was formed in 1994 primarily to cater for the needs of surveying and spatial information professionals working within state and local government and the education sector. Nevertheless, private surveyors also benefit immensely from APAS events such as conferences and seminars, which form an important part of the annual professional development events calendar.

APAS prides itself on organising an annual conference that is highly informative, focused on practical outcomes relevant to the surveying and spatial information community and provides ample opportunity for interaction with colleagues and exhibitors showcasing their newest technology.

The APAS2024 conference was held in Canberra on 18-20 March 2024, with the theme "Pushing the Boundaries". As we continue to push the boundaries of the available technology under challenging conditions to improve workflows and reap the benefits of increased automation, we also encounter instances in practice where the boundaries have been stretched too far and surveyors are instrumental in proving it.

APAS2024 encompassed seven sessions with nineteen presentations, almost half of which included a full paper. Continuing the tradition of being a practically oriented conference, a wide range of topics relevant to our profession was covered. This year's key topics included AUSPOS, geodesy, InSAR, cadastral surveying, complex surveying tasks and how modern technology can be used to our advantage. There was also plenty of opportunity for networking and exploring the newest developments at the technical exhibitors' booths.

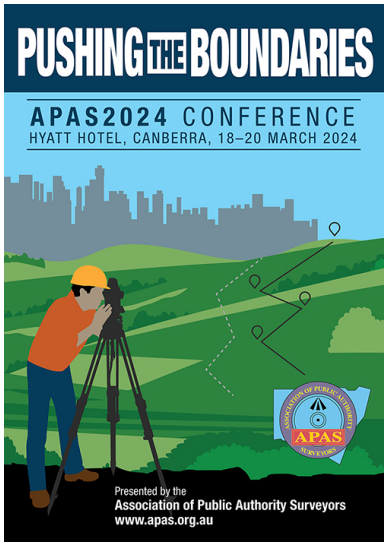

Figure 1: APAS2024 conference.

APAS2024 was a highlight on the CPD calendar and attracted 155 delegates from New South Wales and interstate, with 43% of delegates from private industry. As usual, the conference kicked off on Monday afternoon with the annual APAS team building event (golf tournament).

19TH MARCH – MORNING

The first session started with Dr Volker Janssen (DCS Spatial Services) explaining the RINEX format for GNSS data transfer and storage. He provided a brief history of the RINEX format, outlined examples of recent RINEX format versions and discussed the editing of RINEX observation files and how GNSS data contributes to the datum modernisation efforts in NSW.

Nicholas Gowans (DCS Spatial Services) pushed the boundaries of AUSPOS cluster processing, showing that AUSPOS positioning results do not significantly differ between single-mark processing and cluster processing of concurrent observations. In practice, choosing between AUSPOS processing in single or cluster mode is a decision of convenience rather than performance, at least in NSW.

Dr Carl Wang (Geoscience Australia) outlined the adoption of the new International Terrestrial Reference Frame ITRF2020 (and its GPS-only realisation IGS20) across Geoscience Australia's GNSS analysis products and services. This includes the introduction of a 2-step transformation strategy deployed in the upcoming new version of AUSPOS to provide access to GDA2020.

Figure 2: Presenters captivated the audience with a range of topics.

Figure 3: Greg Ledwidge, Laura Walsh, Mitchel Hanlon, Rachel Greenwood, Dr Craig Roberts, Tom McDonald.

The Official Opening took place at the beginning of the day's second session, starting with a Welcome to Country by Tyronne Bell, Ngunnawal Traditional Custodian. Keynote addresses were then given by Narelle Underwood, Surveyor-General of NSW and Executive Director Spatial Services, Greg Ledwidge, Surveyor-General of the ACT, Mitchel Hanlon, President of ISNSW, The Hon. Kate Lundy, President of the Geospatial Council of Australia, Michelle Blicavs, CEO of Surveyors Australia, and Nigel Petersen, President of APAS.

After the official opening, Thomas Casey (Casey Surveying and Design) discussed the hierarchy of evidence in rural cadastral surveying, using a rail corridor survey near Baradine as an example. Following a thorough search of survey plans and field evidence dating back to 1895, several of the original pegs and reference trees were found in the field, which provided the required evidence to move the boundary definition from a Crown survey.

19TH MARCH – AFTERNOON

The first afternoon session began with Kyran Cook (University of Southern Queensland graduate & APAS UniSQ Student Project Prize 2023 winner) aiming to develop a method to identify erosion using InSAR images in a process called coherent change detection. He found that this method can be used to positively identify erosion due to rain events but also includes false positives due to soil moisture changes.

From a cadastral point of view, Fred de Belin (City of Ryde) investigated a period in early settlement when Aboriginals were still very much a part of the landscape. Outlining some interesting concepts, which are only now, two hundred years later, being recognised by the Australian people, he concluded that Aboriginal claims deserve consideration.

This was followed by several technical exhibitor presentations, showcasing new advances in technology and surveying instrumentation and how these can be used in practice for a wide range of applications. Practical demonstrations gave delegates the opportunity to appreciate and evaluate the capabilities of these instruments in practical scenarios.

At the beginning of the afternoon's second session, Joel Haasdyk (DCS Spatial Services) reported on the growing GDA2020 state adjustment and the progress made towards bringing GDA2020 adjusted coordinates with a rigorously calculated uncertainty to a street corner near you. Significant automation developed in-house has supported a much faster than anticipated re-adjustment of the historic survey data archives from GDA94 to GDA2020, including most of the street-corner control in urban areas.

Vincent Rooke (Geoscience Australia) introduced SouthPAN, the Southern Positioning Augmentation Network, and gave a progress update of project and service delivery and the benefits to users. Covering Australia and New Zealand, SouthPAN is an SBAS augmenting GPS/GNSS positioning signals to significantly improve positioning accuracy and reliability up to the decimetre level without the need for mobile phone or internet coverage.

The gala dinner concluded the day with dinner speaker Dr Brad Tucker (Australian National University) providing a fascinating insight to the new space race and how the surveying and space realms benefit from each other in our understanding of the Earth, the Universe, and our place in it. Dramatic advances in satellite and space-based infrastructure are revolutionising what we can do, measure, and see here on Earth.

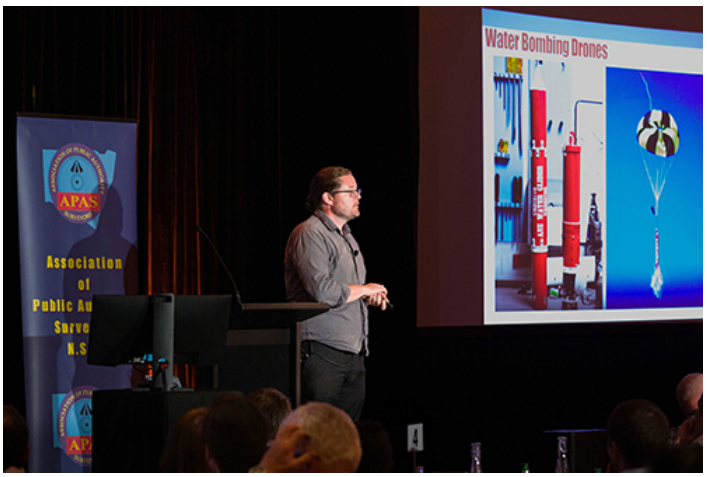

Figure 4: Gala dinner speaker Dr Brad Tucker.

Figure 5: Gala dinner.

20TH MARCH – MORNING

The day's first session kicked off with Jarad Cannings (NSW Public Works) showcasing the critical role of dam monitoring within the context of dam safety requirements for local governments in NSW. He showed several examples focussing on the methodologies applied in dam monitoring, with emphasis on technological advancements and considerations in network design.

Simon Hine and Jonathon Smith (DCS Spatial Services) outlined the innovative LandXML to SCIMS (LX2S) pilot project, which automates the harvesting of State Control Survey observations from registered Deposited Plans, adjusts the 'islands' of harvested observations, and publishes the adjusted GDA2020 coordinates and their quality in SCIMS. They demonstrated the clear benefit and outcomes of the regulatory requirement for survey plans to connect to survey control.

Dr Craig Roberts (UNSW) discussed the future of surveying education in Australia. He emphasised that the university teaching staff should combine teachers with industry experience and researchers with academic experience to meet the requirements expected from university graduates. To this end, UNSW has introduced a model where staff members are half-funded by industry.

At the beginning of the second session, Matthew Bates (DCS Spatial Services) investigated the use of publicly available InSAR data to eliminate the uncertainty of survey mark movement due to large-scale ground deformation. He found that InSAR data can be used to quickly identify areas of concern, but the magnitude of the InSAR-derived velocity values greatly differs from those derived by ground-based methods.

Greg Ledwidge (ACT Surveyor-General) investigated the applicability of Terrestrial Laser Scanning in cadastral surveying, using a stratum subdivision as a case study. While this pilot project was a success,

Figure 6: APAS2024 delegates.

Figure 7: Warren Thomas accepts the Keith Haddon Memorial Prize for the best conference paper from outgoing APAS President Nigel Petersen.

resulting in a successfully examined and registered Deposited Plan, additional work needs to be done to refine standards, techniques, and related guidelines for the future.

This was followed by Mike Stapleton (Lovell Property Consultants) outlining the case of a homeowner and their architect stretching the planning rules beyond their limit and a surveyor's critical role in a court case relating to the rules for home construction. He described the investigation to determine the critical datum ground level, involving contour plans dating back as far as 1910 and aerial imagery dating back to 1951.

Don Urquhart (City of Sydney) presented the cadastral problem of Holdsworth Avenue, Sydney's "road to nowhere," with a landowner attempting to claim a portion of the road via adverse possession. The solution incorporated an investigation of the history of the land, an extensive survey investigation and the registration of a formal plan of dedication. Ultimately, the claim of adverse possession was refuted, and the land was 'returned' to the community.

20TH MARCH – AFTERNOON

The last session commenced with an interactive demonstration and discussion forum on digital survey plans and the CAD translator. Michal London (DCS Spatial Services) and Daniel Griffin (NSW Land Registry Services) outlined and demonstrated the use of the available tools, along with the validation of data, interpretation of the summary report and the 'part-rendered' data ready for drafting. Open discussion then provided a forum for clarifications and feedback on enhancements.

Warren Thomas (formally NSW Public Works) outlined the life and times of Henry Werner, best known as a former surveying lecturer at UNSW. He highlighted the words and wisdom of Henry Werner from way back in 1984, demonstrating their continued relevance to today's fast-changing world by using examples such as how we are grappling with the application, potential and concerns of an unbridled Artificial Intelligence. For this contribution, Warren later received the Keith Haddon Memorial Prize for the best conference paper.

The conference concluded with John Brock (Brock Surveys) exploring art by surveyors and surveyors in art. He presented a vast kaleidoscope of colourful characters throughout history with an impressive collection of artworks either made by surveyors or featuring surveyors, or in some cases both.

At the Annual General Meeting, the following APAS office bearers were elected for 2024/25: Micheal Kocoski (President & ISNSW Representative), Wayne Fenwick (Vice President), Alex Burridge (Secretary & Public Officer), Don Urquhart (Treasurer), Nigel Petersen (Past President), Dr Volker Janssen (Publications Officer), Alecia Goodrich (Conference Manager), and Committee Members Joel Haasdyk and Michael Spiteri.

The APAS2024 conference proceedings are available online from the APAS website (https://www.apas.org.au/).

APAS2025

APAS2025 will be held in Lovedale in the Hunter Valley on 24-26 March 2025. Please consider contributing to next year's conference by presenting a paper. There is a lot of fantastic work being done out there – why not tell the profession about it?

For more information and to indicate interest in presenting at APAS2025, please contact the APAS Publications Officer, Dr Volker Janssen (Publications@apas.org.au).

Dr Volker Janssen, DCS Spatial Services