From The Vault

Women in the Profession

From the Australian Surveyor, December 1977

In 1976 the profession passed an important milestone when the first woman was registered as a land surveyor in Australia. Myra Machin is not only the first woman to enter the profession, for there are others who are members of the Institution. Nevertheless, her registration is a landmark.

Although women surveyors are a commonplace in other countries, particularly in Eastern Europe, women in Western countries have been slow to enter surveying. They have at least been spared the fate of the first women in the more conservative professions, where a woman had to be twice as good as a man to get in and, once successful, was treated with the attitude that she only got there because she was a woman.

We did have a stage when it was agreed, condescendingly, that there are many jobs in surveying that are suitable for women, those concerned usually having in mind indoor work such as computing and photogrammetric plotting. The fact is that the role of women in surveying is the same as the role of men. No favoured treatment is necessary and girls studying surveying have shown, during their vacation work, that they are capable and effective chain-persons. On the other hand surveying and its related fields cover a wide and expanding spectrum of work. Any individual can find the job, within this range, best suited to his or her talents and interests.

The opportunities are there, yet few girls are taking up surveying. This is perhaps a case where the conservatism of women is the main factor. Of the boys who take up surveying, more than half acknowledge the love of the outdoors as the main factor in their choice. This love is certainly not absent among girls.

Many members would welcome women in the profession, and are waiting expectantly. But it is not enough to stand like wallflowers. At the risk of being sexist we must take up the male prerogative and go out courting. Neither girls, not the parents and teachers who advise them are sufficiently aware of the opportunities in surveying. Surveyors, as individuals and through their Institution, should take up an active role in spreading this knowledge.

Myra Machin

The six hundred and thirty-fourth registrant as a Licensed Surveyor in Western Australia is Myra Machin. The registration, dated 27th September, 1976, is of historical significance as Miss Machin is the first woman to be registered as a land surveyor in Australia. The registration brings about another, less important, record in introducing Myra Machin as the youngest "Personality of the Profession" to be featured in this journal.

Myra Machin was born at Bridgetown, Western Australia, in 1953. She received her secondary education at John Curtin and Applecross High Schools and received her Associateship in Applied Science (Surveying) at the Western Australian Institute of Technology in 1974.

Until 1976 she was employed by McKimmie, Jamieson & Partners. During her service with this firm she was engaged in a variety of rural surveys including mapping control and establishment of mining lease boundaries. This work took her to such places as Port Hedland, Norseman and Shay Gap. She spent almost a year in and near the A.C.T. working on urban development surveys.

Since 1976 she has been employed by Kimberley F. Patterson & Associates and, with the three other surveyors in the firm, shares the activities of a survey practice engaged mainly in cadastral surveying.

The Australian Surveyor, December, 1977, Vol. 28, No. 8 533

The fact is that the role of women in surveying is the same as the role of men.

AUSGeoid2020: Improving GNSS-based height determination in NSW

Dr Volker Janssen and Tony Watson, NSW Spatial Services

The Geocentric Datum of Australia 2020 (GDA2020) was gazetted in October 2017 and is to replace GDA94 in practice by 2020.

GDA2020 also requires a new quasigeoid model, AUSGeoid2020, to provide an improved connection between ellipsoidal heights derived from Global Navigation Satellite System (GNSS) observations and the Australian Height Datum (AHD). This article quantifies the expected improvement of using AUSGeoid2020 in conjunction with GDA2020 ellipsoidal heights over using AUSGeoid09 in conjunction with GDA94 ellipsoidal heights to access AHD.

Australian states and territories are in various stages of transitioning from GDA94 to GDA2020. AUSPOS, Geoscience Australia's online GPS processing service, started delivering results in both datums (as well as ITRF2014) in November 2017. Following a coordinated effort in February 2019, CORSnet-NSW and GPSnet now deliver services in both GDA94 and GDA2020 across NSW, the ACT and Victoria.

From July 2019, NSW Spatial Services has made GDA2020 (along with GDA94) available in the Survey Control Information Management System (SCIMS). SCIMS is the State's database containing about 250,000 survey marks across NSW, including coordinates, heights and metadata. Previously, a 2+ hour AUSPOS solution was our preferred method for surveyors to realise and implement GDA2020 on the ground.

Over the last three decades, NSW Spatial Services has evaluated and reported on the performance of each new AUSGeoid product within the bounds of mainland NSW. To enable the discerning reader to evaluate the significant improvements in AUSGeoid products (AUSGeoid98 to AUSGeoid09, and now AUSGeoid2020), we have intentionally re-used the same test methodologies and re-visited the same datasets (with some improvements of course) to allow those improvements in AUSGeoid to be more visible.

Three tests were performed to investigate how well the two most recent quasigeoid models fit known AHD heights across the State, based on (1) 138 CORSnet-NSW sites, (2) seven GNSS-based adjustments of varying extent and size, and (3) numerous height control points from these adjustments. The first test replicates what users of AUSPOS and CORSnet-NSW services can expect, while the other two tests replicate what can be expected when processing and adjusting baselines.

We show that the AUSGeoid2020 product provides a considerably improved fit to AHD across NSW when compared to its predecessor. However, the rigorous uncertainty values provided with AUSGeoid2020 currently appear to be overly conservative, and may therefore be used as a guide only.

Background

GDA2020 is a new, much improved Australian national datum that is based on a single, nationwide least squares network adjustment and rigorously propagates uncertainty. It is defined in the current global International Terrestrial Reference Frame 2014 (ITRF2014) at epoch 2020.0.

In NSW, the move from GDA94 to GDA2020 causes the horizontal coordinates of a mark to shift by about 1.5 m to the north-east (due to tectonic motion of the Australian plate from 1994 to 2020), while the ellipsoidal height decreases by about 0.095 m (due to improvements from ITRF92 to ITRF2014 to better define the shape and size of the Earth).

In practice, vertical coordinates continue to be referenced to AHD. In order to connect to AHD via GDA2020 ellipsoidal heights, a new quasigeoid model (AUSGeoid2020) has been produced. Due to the difference in ellipsoidal heights between GDA94 and GDA2020, it is crucial for users to apply ***only*** AUSGeoid2020 to GDA2020 ellipsoidal heights, while its predecessor AUSGeoid09 ***must*** be used to convert GDA94 ellipsoidal heights. These quasigeoid models and datums ***cannot*** be mixed and matched.

AUSGeoid2020

Just like its predecessor AUSGeoid09, AUSGeoid2020 is a combined gravimetric-geometric quasigeoid.

The gravimetric component is a 1' by 1' grid (about 1.8 by 1.8 km) of improved ellipsoid-quasigeoid separation values created using data from satellite gravity missions, re-tracked satellite altimetry, localised airborne gravity, land gravity data from the Australian national gravity database and a Digital Elevation Model to apply terrain corrections. It is known as the Australian Gravimetric Quasigeoid 2017 (AGQG2017).

The geometric component is basically a 1' by 1' grid (about 1.8 by 1.8 km) of improved quasigeoid-AHD separation values, derived from a much larger dataset of collocated GNSS ellipsoidal heights and AHD heights across Australia. Its purpose is to account for the offset between the quasigeoid and AHD. It should be noted that only a single grid, which combines these two components into ellipsoid-AHD separation values, is made available to users.

While AUSGeoid2020 has the same extent (albeit with a larger computation area during

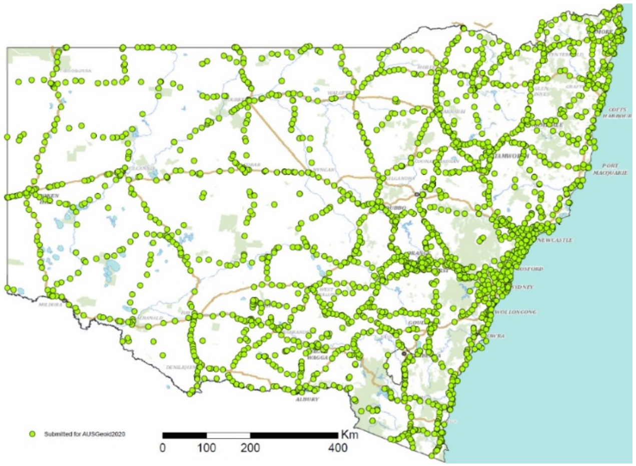

Figure 1: GNSS datasets (6+ hour duration) observed on levelled marks by NSW Spatial Services, contributing to AUSGeoid2020.

its generation) and density as its predecessor, it is based on a much larger and much more homogeneous dataset. For example, NSW Spatial Services has collected over 2,500 extended GNSS datasets (at least 6 hours but generally 12-24 hours duration) on levelled benchmarks across NSW (**Figure 1**).

These datasets inform the geometric component of AUSGeoid2020, thereby helping to provide a much improved connection to AHD for GDA2020 ellipsoidal heights across the State. For AUSGeoid09, only 100 such control points were available.

AUSGeoid2020 provides a rigorous uncertainty value at each grid node, associated with the separation between the ellipsoid and AHD. In contrast, AUSGeoid09 only provides a constant uncertainty estimate (±0.05 m at 1 sigma) for the entire area. Consequently, AUSGeoid2020 users are expected to benefit from more realistic uncertainty information, particularly in the coastal zone where offshore data is included in the model computation and in mountainous regions or other areas that exhibit sparser input datasets.

AUSGeoid2020 performance in mainland NSW

As already mentioned, the move from GDA94 to GDA2020 not only causes the horizontal coordinates of a mark in NSW to shift by about 1.5 m but also the ellipsoidal height to decrease by about 0.095m. A comparison between AUSGeoid09 and AUSGeoid2020 therefore necessitates the availability of both GDA94 and GDA2020 coordinates for the test points utilised.

We can then quantify the expected improvement in the derivation of AHD, via comparison to known AHD heights of sufficient quality (class and order) on public record in SCIMS. Since it is necessary to consider coordinate differences of opposite signs, the Root Mean Square (RMS) is used to quantify the average agreement to AHD.

Test 1: Analysis based on CORSnet-NSW sites

CORSnet-NSW is Australia's largest state-owned and operated network of permanent GNSS reference stations. It is built, owned and operated by Spatial Services, a unit of the NSW Department of Customer Service. NSW is the nation's largest contributor of CORS to the Australian government's National Positioning Infrastructure (NPI), which aims to deliver instant, reliable and accurate access to positioning and timing information anytime and anywhere across Australia (http://www.ga.gov.au/scientific-topics/positioning-navigation/positioning-for-the-future/national-positioning-infrastructure).

As of July 2019, the CORSnet-NSW network consists of 202 reference stations, providing fundamental positioning infrastructure that is authoritative, accurate, reliable and easy-to-use for a wide range of applications (**Figure 2**). Further expansion of CORSnet-NSW is being considered to include up to 220 CORS.

138 of these CORSnet-NSW sites were selected for comparable test calculations. At the time, these sites had both Regulation 13 certified GDA94 coordinates and a locally 'established' SCIMS AHD height (albeit obtained by NSW Spatial Services through an A1 class/order GNSS-based local tie survey). The GDA2020 coordinates of these sites were obtained directly from the national GDA2020 adjustment and can be assumed equivalent to the GDA2020 certified Regulation 13 coordinates issued later.

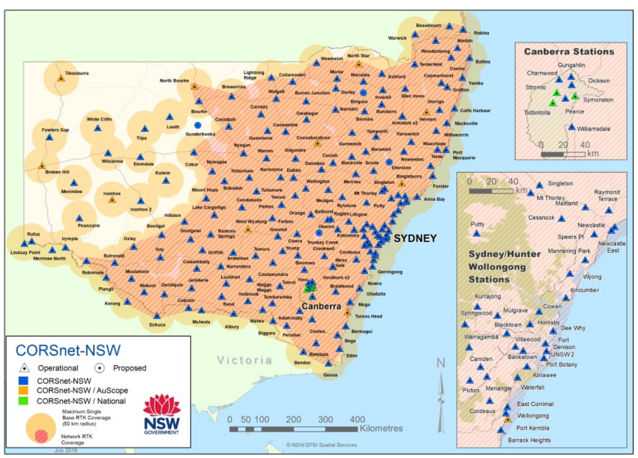

Figure 2: CORSnet-NSW network map as of July 2019.

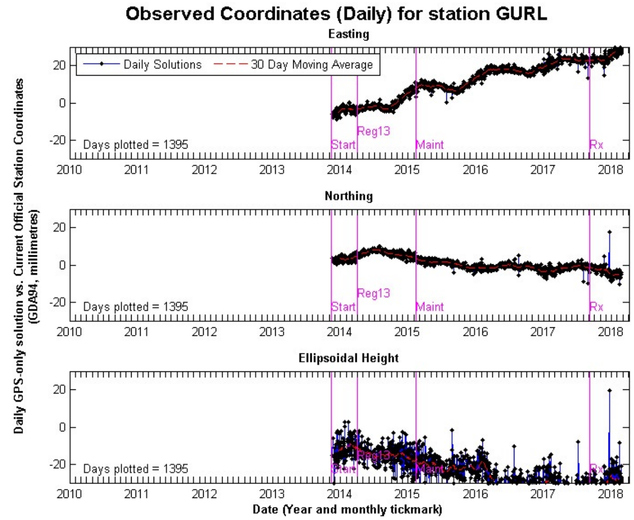

Figure 3: Coordinate time series for GURL CORS, based on daily Bernese processing.

Applying AUSGeoid2020 to GDA2020 national-adjustment derived ellipsoidal heights as opposed to applying AUSGeoid09 to Regulation 13 GDA94 ellipsoidal heights revealed an improvement by a factor of 2.3 in the agreement to AHD with the RMS dropping from 0.056 m to 0.024 m. The range of residuals for this dataset improved by a factor of 1.5, decreasing from 0.33 m (-0.185 m to +0.142 m) to 0.22 m (-0.158 m to +0.063 m).

Importantly, the number of absolute differences from AHD greater than 0.1 m decreased from 12 to 1. The only remaining misfit in excess of 0.1 m occurs at GURL CORS (-0.158 m).

GURL CORS is located in 'black soil' country, which is well known for reactive soils that cause significant ground movement. These problems were clearly evident when processing both the CORS tie survey for GURL, which connected the CORS to the surrounding ground control network, and from our continuous daily station monitoring using the Bernese software (**Figure 3**).

Consequently, in SCIMS, GURL CORS was assigned class/order E5 for its AHD height, so the larger difference was expected. It should be noted that the height difference to SCIMS is even larger when using AUSGeoid09 (-0.185 m).

If GURL CORS is excluded from the analysis, the improvement achieved is even more pronounced. Using AUSGeoid2020 provides an improvement by a factor of 2.7 in the agreement to AHD with the RMS dropping from 0.054 m to 0.020 m. The range of residuals decreases from 0.25 m (-0.107 m to +0.142 m) to 0.12 m (-0.053 m to +0.063 m), improving by a factor of 2.2. As we will see below, this is within the published range of uncertainty values.

Test 2: Constrained 3D network adjustment (overall fit)

In order to get an indication of the performance of the new quasigeoid model in practice with regards to GNSS-based adjustments in NSW, seven 3-dimensional network adjustments were run with GeoLab using AUSGeoid09 in conjunction with GDA94 and AUSGeoid2020 in conjunction with GDA2020. The original quasigeoid files were converted to GeoLab geoid files using software developed in-house, which has been tested and validated over 20 years.

Height control points used for these adjustments had accurate (i.e. LCL3 or B2, or better), predominantly levelled AHD height values that were converted to ellipsoidal values before the adjustment using the selected quasigeoid model. All accurate height values were tightly constrained in the adjustment and the resulting variance factor and flagged residuals were inspected to get an indication of the overall fit of the adjustment to AHD across NSW.

Seven GNSS-based adjustment datasets were examined, increasing in size, extent and height variation from small to a state-wide network. **Table 1** summarises relevant information about these adjustments, while **Figure 4** illustrates their location and extent in NSW. It should be noted that each baseline component is represented as a separate observation.

Table 1: Summary of the GNSS-based adjustment datasets used in this study.

Adjustment	Extent (km)	Height Range (m)	No. of Sites	No. of Obs	No. of Hgt Constraints	Baseline Length (km)	Avge Bsl Length (km)
1: South Coast	21 x 18	7 – 296	18	159	12 (67%)	0.4 – 12	5
2: Oxley Hwy	53 x 35	116 – 1,208	13	108	6 (46%)	0.03 – 53	16
3: Singleton	33 x 42	30 – 442	87	631	55 (63%)	0.6 – 30	5
4: Bellingen	40 x 27	2 – 1,041	107	565	63 (59%)	0.3 – 23	2
5: Bland	212 x 162	167 – 544	155	1,075	70 (45%)	0.1 – 67	12
6: SW NSW	633 x 553	20 – 645	34	752	26 (76%)	8 – 270	128
7: NSW	1,000 x 800	2 – 2,229	89	1,721	11 (12%)	3 – 393	130

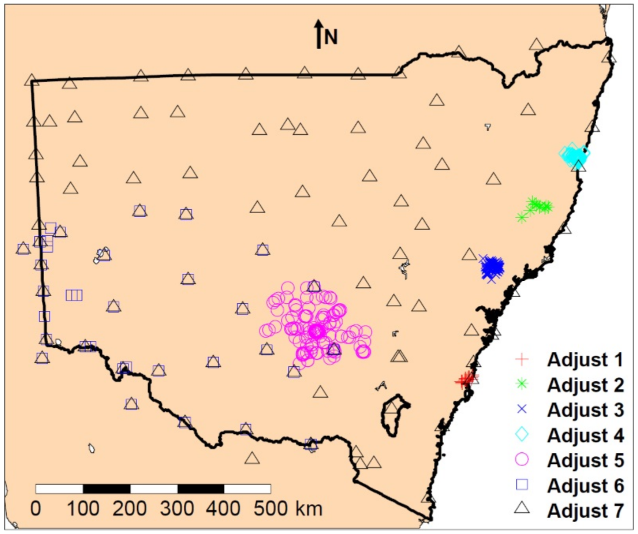

Figure 4: Location and extent of the GNSS-based adjustment datasets investigated.

In general, AUSGeoid2020 improved the variance factor (**Table 2**) and resulted in a comparable number of flagged residuals, indicating a better adjustment result in comparison to using AUSGeoid09.

The largest improvement was gained in adjustment 5, with the variance factor improving by a factor of 2.3, while the number of flagged residuals was reduced from 1 to 0. This adjustment covers a moderately sized area and exhibits a moderate variation in height, illustrating the positive effect AUSGeoid2020 can have on GNSS-based height determination in NSW.

Adjustments 3 and 4 cover equally small areas and contain rather short baseline lengths. However, the improvement gained by using AUSGeoid2020 is much more pronounced for adjustment 3, which exhibits a moderate variation in height (variance factor improving by a factor of 1.8).

For adjustment 4, which incorporates a large variation in height, the variance factor improves by a factor of 1.2, suggesting that most improvement is gained in areas exhibiting moderate height variations. Intuitively, this makes sense as input data density for AUSGeoid modelling is routinely lower at higher elevations.

The overall fit of the large adjustments (6 and 7) also improved but only slightly (factor of 1.1). These adjustments cover very large areas with average baseline lengths of 130 km, reaching up to 270 km and 390 km respectively. It can therefore be expected that distance-dependent error sources mask the improvement achieved by using AUSGeoid2020 to some degree.

In one case, adjustment 2 (a small adjustment exhibiting a large variation in height), the variance factor increased slightly, bringing it a little closer to unity, while the number of flagged residuals increased from 0 to 2. However, this does not necessarily mean that AUSGeoid2020 performs worse than AUSGeoid09 in this case. A possible explanation is that previously hidden outliers are now detectable.

From the limited amount of data analysed here, no correlation is evident between the number of constrained AHD heights included in the adjustment and the improvement gained by utilising AUSGeoid2020.

Test 3: Minimally constrained 3D network adjustment (height observation residuals)

In a further attempt to evaluate the performance of AUSGeoid2020 in practice, a third test was performed, based on the seven adjustments mentioned above. Here, only one observed AHD height was held fixed (a stable mark located in the centre of the adjustment area), while the others were introduced as observations and allowed to float.

Therefore, the adjustment was minimally constrained in height. For the marks that had accurately known AHD heights, the adjusted heights (obtained by applying AUSGeoid09 to GDA94 ellipsoidal heights or AUSGeoid2020 to GDA2020 ellipsoidal heights) were compared against their known AHD values by analysing the residuals of the height observations after the adjustment.

Table 2: Variance factors obtained for the adjustments investigated.

Adjustment	AUSGeoid09	AUSGeoid2020	Improvement Factor
1: South Coast	1.19	1.16	1.0
2: Oxley Hwy	0.54	0.71	0.8
3: Singleton	1.05	0.59	1.8
4: Bellingen	1.12	0.93	1.2
5: Bland	1.00	0.43	2.3
6: SW NSW	0.24	0.22	1.1
7: NSW	0.63	0.60	1.1

The values of these residuals indicate how well the quasigeoid model fits the AHD heights. For each of the adjustment datasets described above, the height observation residuals are summarised in **Table 3**.

It is evident that the use of AUSGeoid2020 considerably improves the residuals in most cases with improvement factors generally around 1.4. By far the largest improvement is achieved for adjustment 5 with improvement factors of 1.8 for the RMS and 2.4 for the range of the residuals.

In all but one case, the RMS values of the AUSGeoid2020 results show significant improvement and fall well within ±0.05 m, i.e. the accuracy estimate stated (and verified) for AUSGeoid09, although the range of residuals remains rather large in some cases.

However, while adjustments 6 and 7 show improvement in RMS, the actual RMS values are greater than 0.05 m. This was expected because these two adjustments cover large areas and contain relatively long average baseline lengths of 130 km. On the positive side, the range of residuals is significantly reduced in these two cases (by factors of 1.7 and 1.8 respectively).

Only adjustment 2 shows no improvement over AUSGeoid09, with both the RMS and range of residuals increasing slightly. Considering that the sample size is very small and this adjustment exhibits a large variation in height, this result needs to be taken with caution.

In summary, all three tests have shown that AUSGeoid2020 substantially improves access to AHD for GNSS-based positioning in NSW. Furthermore, our results agree with absolute testing performed on a national level.

Rigorous propagation of AUSGeoid2020 uncertainty

AUSGeoid2020 provides a rigorous uncertainty value associated with the separation between the ellipsoid and AHD, varying as a function of location. This is a world first – no other nation has successfully computed rigorous geoid uncertainties.

These uncertainties are based on a linear combination of errors from the gravimetric quasigeoid, the published AHD heights and the GDA2020 ellipsoidal heights. This was deliberate to account for errors originating from all data sources contributing to AUSGeoid2020.

In order to briefly investigate the practical usefulness of the new uncertainty component of the AUSGeoid product, absolute uncertainty values were calculated for each survey mark used in this study (approx. 610 in total).

About 70% of these AHD heights are independent of the data used to compute AUSGeoid2020. The resulting absolute (1 sigma) uncertainty values were determined via bi-cubic interpolation and ranged from about 0.07 m to 0.11 m, with a mean of 0.086 m.

Figure 5 illustrates the distribution of this AUSGeoid2020 uncertainty across NSW, as obtained from the official AUSGeoid product. The location of levelled benchmarks along major roads, observed via GNSS by NSW Spatial Services in preparation for the AUSGeoid2020 product (see Figure 1), is clearly visible with a commensurate improvement in uncertainty at those locations.

Judging from the results presented in this article (with RMS on small to medium sized jobs well within ±0.05 m), it is apparent that these uncertainty values are overly conservative. Furthermore, the smallest rigorously propagated uncertainty value (0.07 m) is larger than the (constant) ±0.05 m accuracy estimate stated (and verified) for the previous product (AUSGeoid09), although the new product is based on much improved input datasets and modelling.

Consequently, the absolute AUSGeoid2020 uncertainty grid currently should be used as a guide only. It is important to note that we have not investigated the ***relative*** uncertainties of the AUSGeoid2020 uncertainty grid (between marks). These will be much smaller – GNSS heighting using AUSGeoid2020 has recently demonstrated to be better than third-order levelling at distances of more than 3 km.

It is important to emphasise that our brief comparison can only provide a general assessment of the current rigorously

Table 3: Results of the height observation residual analysis.

Adjustment	Parameter	AUSGeoid09	AUSGeoid2020	Improvement Factor
1: South Coast (11 marks)	RMS (m)	0.024	0.022	1.1
	Range (m)	0.070	0.059	1.2
2: Oxley Hwy (5 marks)	RMS (m)	0.034	0.038	0.9
	Range (m)	0.050	0.076	0.7
3: Singleton (53 marks)	RMS (m)	0.029	0.021	1.4
	Range (m)	0.104	0.076	1.4
4: Bellingen (60 marks)	RMS (m)	0.053	0.044	1.2
	Range (m)	0.340	0.246	1.4
5: Bland (68 marks)	RMS (m)	0.049	0.027	1.8
	Range (m)	0.281	0.115	2.4
6: SW NSW (24 marks)	RMS (m)	0.087	0.061	1.4
	Range (m)	0.408	0.234	1.7
7: NSW (9 marks)	RMS (m)	0.144	0.071	2.0
	Range (m)	0.411	0.231	1.8

calculated AUSGeoid2020 uncertainties. ICSM plans to continually refine AUSGeoid in the coming years, so more thorough investigations will be required in the future.

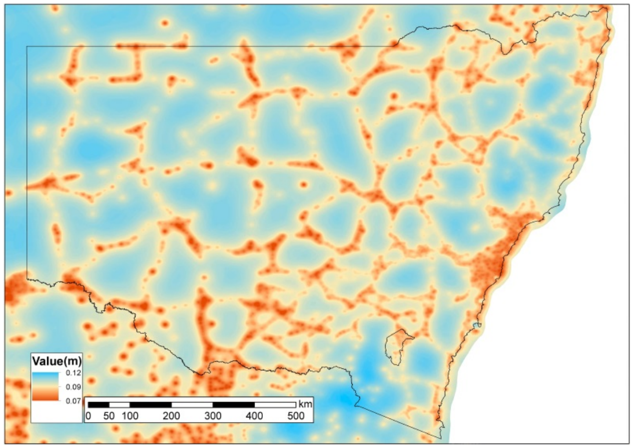

Figure 5: Distribution of absolute AUSGeoid2020 uncertainty across NSW.

Do the derived AHD values change when moving to AUSGeoid2020?

Comparing the derived AHD values, obtained by applying AUSGeoid2020 to GDA2020 ellipsoidal heights and applying AUSGeoid09 to GDA94 ellipsoidal heights in an absolute sense, it is evident that these values change. **Figure 6** illustrates this across NSW, showing that derived AHD values generally change by a few centimetres but larger changes of up to ±0.3 m occur in some areas.

Considering that the AUSGeoid2020 product is based on a much larger dataset and better modelling than its predecessor, this was expected. It should be noted that the effect of this offset will be much smaller for *relative* GNSS heighting between marks located nearby.

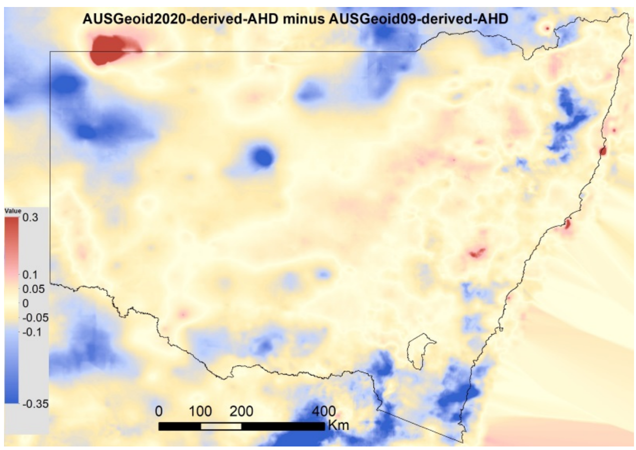

Figure 6: Difference in metres between AUSGeoid2020-derived AHD and AUSGeoid09-derived AHD across NSW.

Conclusion

NSW Spatial Services is in the process of making GDA2020 available via CORSnet-NSW, SCIMS and other NSW spatial datasets. We have shown that the AUSGeoid2020 product provides a considerably improved fit to AHD across mainland NSW when compared to its predecessor.

The improvement achieved with AUSGeoid2020 can be explained mainly by the larger, denser and higher-quality input dataset and improved modelling. Users who derive their initial ellipsoidal heights using AHD and a quasigeoid model can expect that AUSGeoid2020 will serve them very well and the elevation products will represent local AHD much better than in the past.

However, the key take-home message is that AUSGeoid2020 can ***only*** be used in conjunction with GDA2020 ellipsoidal heights, while AUSGeoid09 ***must*** be used to convert GDA94 ellipsoidal heights to AHD. These quasigeoid models and datums ***cannot*** be mixed and matched.

Dr Volker Janssen <Volker.Janssen@finance.nsw.gov.au> and Tony Watson <Tony.Watson@finance.nsw.gov.au> work at Spatial Services, a unit of the NSW Department of Customer Service.

Using your feedback to improve plan registration

By Adam Bennett, Chief Executive Officer of NSW Land Registry Services

It has been two years since NSW Land Registry Services became the custodians of the land titles registers and registering plans to build on the surveying cadastre. During that time you will have experienced some changes as we review how we serve you, our customers, and how we manage the plan registration process.

We have registered over 22,000 plans and attended dozens of meetings and conferences with the surveying profession in that time. We have continued our support of the NSW Surveying Task Force to promote career opportunities in the surveying profession.

Our team continues to work hard to make it easier for you to register plans while ensuring we meet the regulatory requirements of plan registration.

We appreciate our relationships with you and with professional associations including the Institution of Surveyors NSW, particularly the honest feedback you have shared about your experience of working with us. Thanks to that feedback, we have made a number of changes to our systems, processes and approach.

Three recent changes show how your feedback is helping us to deliver better outcomes for you and for your clients.

INCREASING EPLAN CREDIT LIMITS TO ASSIST 'LARGE LODGERS'

For surveyors that regularly lodge a large number of plans using ePlan – our electronic plan lodgment system – you may have hit the system's credit limit from time to time. When this happened, surveyors would request, and we would allow, a temporary increase to their credit limit so that they could submit the plans they lodged via ePlan.

There was no regulatory basis for these credit limits and we consistently increased them when asked by surveyors, so the limits were causing unnecessary paperwork for both surveyors and for NSW LRS.

As a result, we have recently increased the credit limit for all ePlan users to $1 million. This eliminates the need for 'large lodgers' to regularly request a credit limit increase. Our analysis of ePlan data suggests that it's extremely unlikely that any surveyors will reach this limit at any one time.

Plans are only registered once all associated fees (including requisition fees) have been paid. To ensure plans are registered expeditiously, we recommend that surveyors sign up for direct debit. Accounts are debited when the plan is in registerable form. If you would like to set up a direct debit with NSW LRS, please contact account.inquiry@nswlrs.com.au.

We hope these changes make administration easier for frequent ePlan users.

PLAN LODGMENT CHECKLISTS TO SUPPORT PLAN PREPARATION

Feedback that surveyors consistently share with us is about plan requisitions due to lodgment or plan errors. We know that you often find this frustrating. We don't enjoy requisitions either and ideally we would like to never have to raise one.

We have talked at length with the surveyors and surveying professional bodies including ISNSW about how we can simplify the registration process and reduce requisitions while satisfying the regulatory requirements.

Acting on those discussions, we introduced plan lodgment checklists earlier this year. Lodgment checklists are available for Deposited Plans, Strata Plans and Community Plans. The checklists assist surveyors and lodging parties to quality check their plans prior to lodgment to reduce requisitions and the time it takes to reach registration.

The Deposited Plan Reference Guide was also published in May 2019. The Reference Guide outlines how the legislative framework applies to deposited plans to ensure all parties understand why registration and requisition decisions are made.

Since the lodgment checklists were introduced, we have seen a slight improvement in the requisition rate. To assist with this, from 1 July 2019 the Deposited Plan lodgment checklist is compulsory for all deposited plan lodgments. Your ongoing support in using the checklists and reviewing plans prior to lodgment will continue to improve the requisition issue for all of us.

NEW NSW LRS WEBSITE SIMPLIFIES INFORMATION ACCESS

We know from speaking with surveyors that you found it difficult to navigate the online information that was available about NSW LRS processes and the Registrar General's Guidelines. Frankly, our website delivered a poor user experience and was very difficult to browse or search.

We greatly valued the contributions from our key stakeholders to the website's development, including surveyors and professional bodies including ISNSW.

You told us loud and clear that the website wasn't meeting your needs, and so we were very pleased to launch our new website in May – www.nswlrs.com.au. The new site-wide search brings together information from the NSWLRS website and the Registrar General's Guidelines in one place to make it easier to access lodgment requirements, forms, fact sheets, and other resources.

We hope you are adjusting to the new website and find it easier to use. We welcome your feedback and ask you to share your compliments or complaints using the website's Contact Us online form.

It's pleasing to reflect on the progress we have made in the past two years to improve how we work together. We enjoy a productive, honest working relationship with ISNSW and will continue to work with you to improve in the years ahead.

NSW LAND REGISTRY SERVICES