

NATIONAL VINEYARD SCAN 2019

Summary Report

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National Vintage Scan 2019 (NVS2019)

In May 2019, Consilium Technology delivered the inaugural National Vintage Scan report for the 2018 vintage (NVS2018). NVS2018 represented a departure from all previous measurements of the production capacity of the Australian wine industry through the analysis of satellite imagery using state-of-the-art machine learning techniques. This produced results with higher accuracy and lower cost when compared to the previous manual survey method. The same approach of machine learning applied to high-resolution satellite imagery has been used in the production of NVS2019, which this report summarises.

Results of NVS2019

GAIA scanned Australia on a state-by-state basis for NVS2019. In total, **16,934** areas of interest (AOIs) within **836** different satellite captures were passed through GAIA's machine learning infrastructure. The total area of the AOIs covered **~3.7 million hectares** of imagery from the current vintage growing season.

After the outputs were manually reviewed, the total area of vineyard blocks was found to be **146,244** hectares. This represents a slight increase from the value of 146,128 hectares reported for NVS2018. It shows an increase in the total area of vineyards for SA, NSW (including ACT) and QLD, whereas a decrease for WA, TAS and VIC. The decrease in reported vineyard area for these 3 states has been investigated and can predominantly be attributed to the removal of *false positives*. False positives are where GAIA has indicated that vineyards exist, but where no vineyards actually exist; for example, an orchard may have been identified as a vineyard. Specifically, enhanced human review of GAIA's machine generated output for NVS2019 has led to the removal of many such false positives from the data set. Thus, it should be emphasised that the values reported for NVS2019 more accurately represent the on-ground reality than NVS2018. Identification of many of these false positives, and indeed general improvements to the scan results for NVS2019, are the result of feedback provided by users of the GAIA NVS2018 vineyard maps. Consilium Technology thanks everyone that has provided feedback on GAIA.

National Results

Table 1. Summary statistics of wine vineyard block area for each state and Australia.

State	Total area "scanned" (ha)	Total area of vineyards (ha)
WA	209,901	10,784
TAS	257,423	1,702
SA	948,558	76,292
VIC	764,693	22,151
NSW (incl ACT)	1,249,170	34,641
QLD	274,990	674
TOTAL	3,704,735	146,244

Western Australia Results

Table 2. Vineyard area for all Geographical Indications in WA.

GI name	GI type	Total area of vineyards (ha)
Central Western Australia	Zone	42
Eastern Plains Inland and North	Zone	0
Greater Perth	Zone	849
South West Australia	Zone	9893
Western Australia South East Coastal	Zone	0
Blackwood Valley	Region	309
Geographe	Region	790
Great Southern	Region	2480
Manjimup	Region	153
Margaret River	Region	5671
Peel	Region	52
Pemberton	Region	466
Perth Hills	Region	119
Swan District	Region	709
Albany	Subregion	80
Denmark	Subregion	89
Frankland River	Subregion	1323
Mount Barker	Subregion	868
Porongurup	Subregion	96
Swan Valley	Subregion	525

Tasmania Results

Table 3. Vineyard area for all Geographical Indications in Tasmania.

GI name	GI type	Total area of vineyards (ha)
Tasmania	Zone (state)	1702

South Australia Results

Table 4. Vineyard area for all Geographical Indications in SA.

GI name	GI type	Total area of vineyards (ha)
Barossa	Zone	13519
Far North	Zone	176
Fleurieu	Zone	15318
Limestone Coast	Zone	15405
Lower Murray	Zone	22261
Mount Lofty Ranges	Zone	9541
The Peninsula	Zone	72
Adelaide Hills	Region	3832
Adelaide Plains	Region	498
Barossa Valley	Region	11156
Clare Valley	Region	4994
Coonawarra	Region	5293
Currency Creek	Region	1054
Eden Valley	Region	2102
Kangaroo Island	Region	145
Langhorne Creek	Region	6094
Mclaren Vale	Region	7173
Mount Benson	Region	535
Mount Gambier	Region	274
Padthaway	Region	4067
Riverland	Region	21816
Robe	Region	677
Southern Fleurieu	Region	488
Southern Flinders Ranges	Region	176
Wrattonbully	Region	2666
High Eden	Subregion	391
Lenswood	Subregion	245
Piccadilly Valley	Subregion	221

Victoria Results

Table 5. Vineyard area for all Geographical Indications in Victoria.

GI name	GI type	Total area of vineyards (ha)
Central Victoria	Zone	4363
Gippsland	Zone	187
North East Victoria	Zone	2903
North West Victoria	Zone	8656
Port Phillip	Zone	4329
Western Victoria	Zone	1714
Alpine Valleys	Region	241
Beechworth	Region	127
Bendigo	Region	610
Geelong	Region	467
Glenrowan	Region	205
Goulburn Valley	Region	1214
Grampians	Region	640
Heathcote	Region	1696
Henty	Region	139
King Valley	Region	1483
Macedon Ranges	Region	215
Mornington Peninsula	Region	920
Murray Darling Vic	Region	6736
Pyrenees	Region	870
Rutherglen	Region	779
Strathbogie Ranges	Region	534
Sunbury	Region	101
Swan Hill Vic	Region	1915
Upper Goulburn	Region	289
Yarra Valley	Region	2536
Great Western	Subregion	468
Nagambie Lakes	Subregion	513

New South Wales Results

Table 6. Vineyard area for all Geographical Indications in NSW.

GI name	GI type	Total area of vineyards (ha)
Big Rivers	Zone	25213
Central Ranges	Zone	4512
Hunter Valley	Zone	2609
Northern Rivers	Zone	136
Northern Slopes	Zone	115
South Coast	Zone	302
Southern New South Wales	Zone	1748
Western Plains	Zone	8
Canberra District	Region	330
Cowra	Region	932
Gundagai	Region	595
Hastings River	Region	13
Hilltops	Region	595
Hunter	Region	2609
Mudgee	Region	1922
Murray Darling Nsw	Region	6754
New England Australia	Region	77
Orange	Region	1060
Perricoota	Region	416
Riverina	Region	17248
Shoalhaven Coast	Region	41
Southern Highlands	Region	140
Swan Hill Nsw	Region	171
Tumbarumba	Region	215
Broke Fordwich	Subregion	510
Pokolbin	Subregion	1355
Upper Hunter Valley	Subregion	471

Queensland Results

Table 7. Vineyard area for all Geographical Indications in QLD.

GI name	GI type	Total area of vineyards (ha)
Granite Belt	Region	317
South Burnett	Region	218

Producing NVS2019

The production of NVS2019 saw many improvements to process, but also additional challenges to overcome. At a technical level, the mechanisms for running the scan at scale were improved to streamline the generation of data and reduce the possibility of human error. The generation of statistics and metrics was optimised and broadened, to provide more insight and allow for faster iteration on scan data.

The search areas that were scanned in the pursuit of vineyard geolocation were refined from those used in NVS2018 in consultation with Wine Australia. The proportion of satellite data available from the current vintage growing season (1st July 2018 - 30th June 2019) for NVS2019 was 84%, with the remaining 16% being satellite data from prior to 1st July 2018. This is a marked increase from NVS2018, where 64% of satellite data was from the 2018 vintage growing season for NVS2018. This gives NVS2019 significantly more temporal currency than NVS2018. This increase was a result of the partnership between Maxar and GAIA to actively task satellites to capture imagery of vineyards during the Australian summer.

The spatial alignment of produced vineyard block boundaries to the basemap has also improved, as viewed in the GAIA web-app. This improvement was the result of a change in the basemap produced by Maxar and was supported by technical improvements within GAIA to enhance the *spatial registration* of map boundaries with the basemap imagery, as shown in Figure 1.

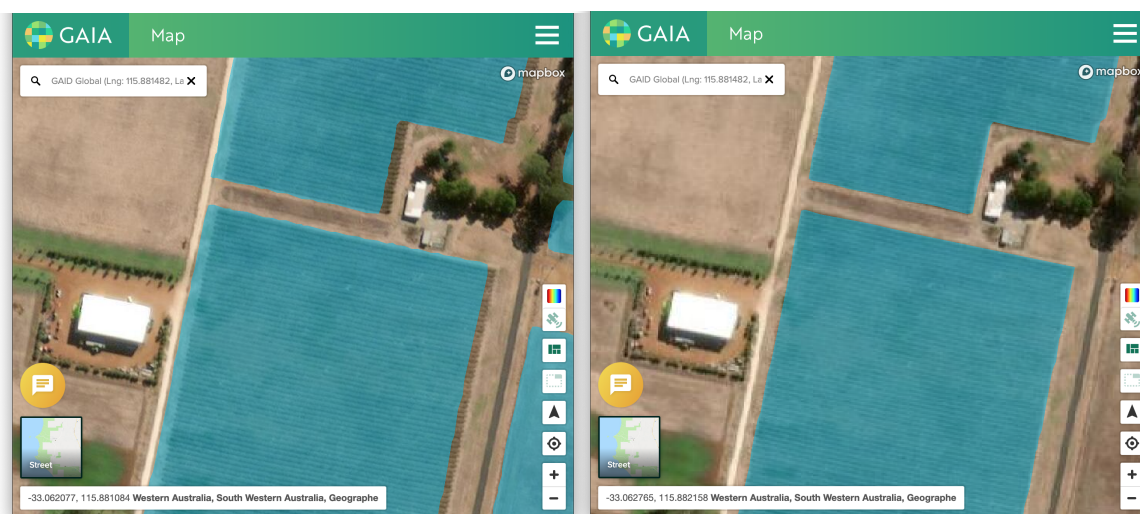


Figure 1. Basemap registration of the NVS2018 (left) compared to the *improved* NVS2019 (right).

A related enhancement present in the NVS2019 results is the general improved vineyard block boundaries right across Australia, as demonstrated in Figure 2.

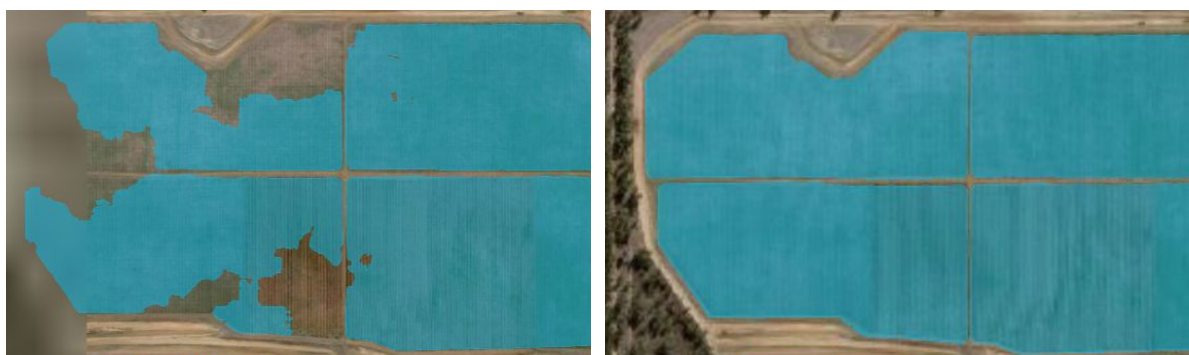


Figure 2. Vineyard block boundaries of the NVS2018 (left) compared to the *improved* NVS2019 (right).

An additional improvement to NVS2019 came from a significant reduction in false positives. These are areas that GAIA's machine learning system has mistakenly identified as vineyards but are actually orchards or other vegetation. This is exemplified in the "Eastern Plains Inland and North" GI of Western Australia, which previously reported vineyards that have been found to be spurious. Reducing these false positives represents a refinement of results, and is an improvement complementary to detecting previously unknown vineyards. This is the dominant factor in GIs that have seen reduced area estimates, showing a refinement of the data rather than an indication of vineyards being grubbed up.

Additional technical details of the process of producing NVS2019 can be found in the 2018 vintage national scan summary report [1] or the full report [2].

References

- [1] Anthony Milton, Sebastien Wong & Sarah Hibbard (2019) "NATIONAL VINEYARD SCAN 2018 Summary Report" v1.0, 7th June 2019, CT-TR-2019-00029. [Download from Wine Australia](#)
- [2] Anthony Milton, Joseph Schlauzero, Lucas Sargent, Adam Gatt & Sebastien Wong (2019) "NATIONAL SCAN OF VINEYARDS, MILESTONE REPORT Y1.8: National Scan 2018" v1.1, 23rd May 2019, CT-TR-2019-00027. [Download from Wine Australia](#)