

GDA2020 Adoption: Who, When, Why?

Joel Haasdyk

Spatial Services

NSW Department of Finance, Services & Innovation

Joel.Haasdyk@finance.nsw.gov.au

ABSTRACT

The year 2020 is just around the corner, and 1 January 2020 is the nominal deadline for the adoption of our new national datum, the Geocentric Datum of Australia 2020 (GDA2020). During such a time of change, it is important to keep everyone on the same page, and to explore the expectations and understanding of all participants. This presentation describes recent work towards the implementation of GDA2020 within the Department of Finance, Services and Innovation (DFSI) and across NSW government, academia and industry. Expected timeframes are provided for the ‘enabling’ and ‘adopting’ of GDA2020 within NSW and Australia. The importance of metadata and the development of related standards are discussed, along with various challenges and opportunities explored along the road to implementation. Finally, we look forward to the next necessary facet of datum modernisation: the implementation of time-dependent coordinates and what this really means for you, the user.

KEYWORDS: Datum modernisation, GDA2020, ATRF, time-dependent, transformation, metadata.

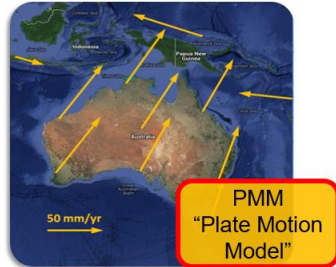
Take home messages

- GDA2020 is static **like GDA94, but ~2m NE**
... but the earth is moving...
- ATRF is “time-dependent” **ATRF = GDA2020 + PMM**
- **GDA2020 & GDA94 both to be supported**
- **2018 = Prepare**
- **2019 = Enable**
- **2020 = Adopt** (Registered Plans to require GDA2020 from 01 Jan 2020)
- Example – Combine GDA94, GDA2020, WGS84 using on-the-fly **Tf** (QGIS)
- Questions / Discussion

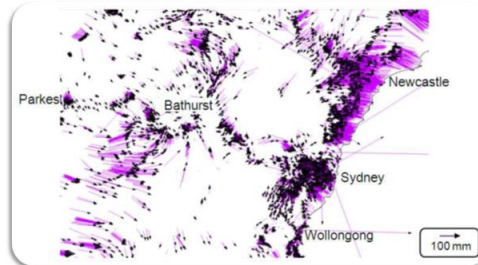
2

Why update the Australian Datum?

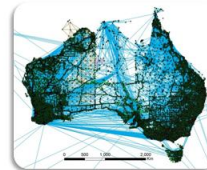
Australia is on the move



Known Distortions in GDA94



Improved
Geodetic
Technologies



National
Adjustment

3

Changes to GPS (GNSS) positioning capability

NPI NATIONAL POSITIONING
INFRASTRUCTURE CAPABILITY

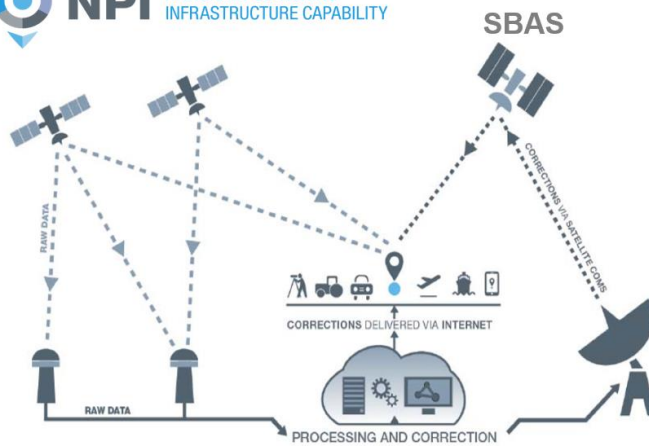


Image courtesy of Geoscience Australia 4

Changes to GPS (GNSS) positioning capability

“Geospatial data is the foundation of the future economy”

5

GDA94, GDA2020 and ATRF

“Know your data, Know your date, Know your datum”

GDA2020

- new STATIC datum
- behaves like GDA94
- up to 1.8m NE of GDA94
- Better precision

ATRF

Australian Terrestrial Reference Frame

- Future proofing
- “Time-dependent” datum
- behaves like ITRF
- 7cm / year toward NE
- **ATRF = GDA2020 + PMM**

6

GDA2020 - Implementation

ICSM GDA Modernisation Implementation Working Group (GMIWG)

- Website, Facts Sheets, FAQs, Products and Manuals:
www.icsm.gov.au/datum/what-gda2020
- Video - vimeo.com/191566518
- Online Forum - www.icsm.gov.au/datum/gda2020-forum



7

How to Access GDA2020 and use NTV2 Grids?

A QGIS Example to combine GDA94, GDA2020 & WGS84



8

Online transformation tools and services

- NTV2 Transformation grids: https://github.com/icsm-au/transformation_grids
- Online transformation service: <http://positioning.fsfdf.org.au/> (Samples only)
- QGIS plugins https://plugins.qgis.org/plugins/icsm_ntv2_transformer/ (Or via QGIS plugin lib)

The image shows two overlapping screenshots. The background is a GitHub repository page for 'GDA94 - GDA2020 Online Transformation Service'. It lists several GSB files, with 'GDA94_GDA2020_conformal_1984_2020.gsb' highlighted in a red box. The foreground is a screenshot of the 'QGIS Python Plugins Repository' for the 'ICSM NTV2 Transformer' plugin. A red box highlights the text 'Automatically loads the GSB files'. The plugin description states: 'This plugin uses official ICSM grids to transform between Australian coordinate systems. This plugin enables accurate transformations using official Australian NTV2 grids.'

QGIS - Web Services Setup, in WGS84

The image shows a screenshot of the QGIS interface. On the left, a browser window displays the 'SPATIAL SERVICES' portal from 'spatialservices.finance.nsw.gov.au'. The 'WEB SERVICES' link is highlighted with a red box. The main QGIS window shows a map of a coastal area with numerous colored points and labels. The 'Layers' panel on the right shows several layers, including 'SurveyMark', 'Points_of_Interest', 'Lot_Labels', and 'BestImageryDates'. The status bar at the bottom indicates 'Getting map via WMS. Coordinate: 16831953, -4010350. Scale: 1:12327. Magnifier: 100%. Rotation: 0.0'.

WGS84 is time-dependent

GPS (GNSS) and plate-tectonics

Precise ground coordinates (WGS84)
 for precise satellite positions (WGS84)

WGS84 & Web Mercator (Spherical Mercator vs. World Mercator)

Underlying Image courtesy of ESRI Australia

QGIS – Bring in your own GDA94 & GDA2020 Data

QGIS Python Plugins Repository

ICSM NTV2 Transformer

Download latest

☆☆☆☆☆ (1) votes

Automatically loads GSB files

This plugin uses official ICSM grids to transform between Australian coordinate systems.

About Details Versions

This plugin enables accurate transformations using official Australian NTV2 grids.

marktype	marknumber	monumentty	trigname	mgaesting	mganorthin	mgaone	ahdheight	grsheight
1	TS	3663 CONC PILLAR	PANORAMA	736823,435...	6295913,616...		55	873,850000000000

MARKTYPE	MARNUMBER	MONUMENTTY	TRIGNAM	MGAESTING	MGANORTHIN	MGAZONE	AHDHEIGHT	GRSHEIGHT
1	TS	3663 CONC PILLAR	PANORAMA	736823,435...	6295913,616...		55	873,850000000000

13

QGIS Transformation On-The-Fly

Define 'On-the-fly' Transformations

GDA94 ↔ GDA2020

WGS84 ↔ GDA94 ↔ GDA2020

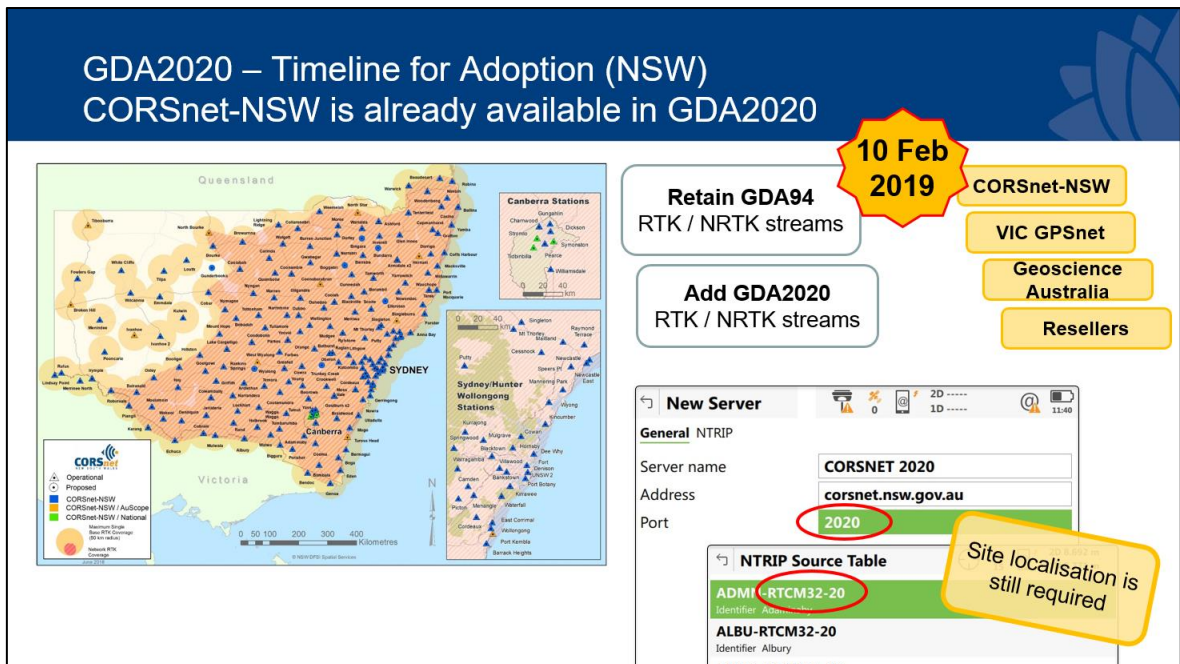
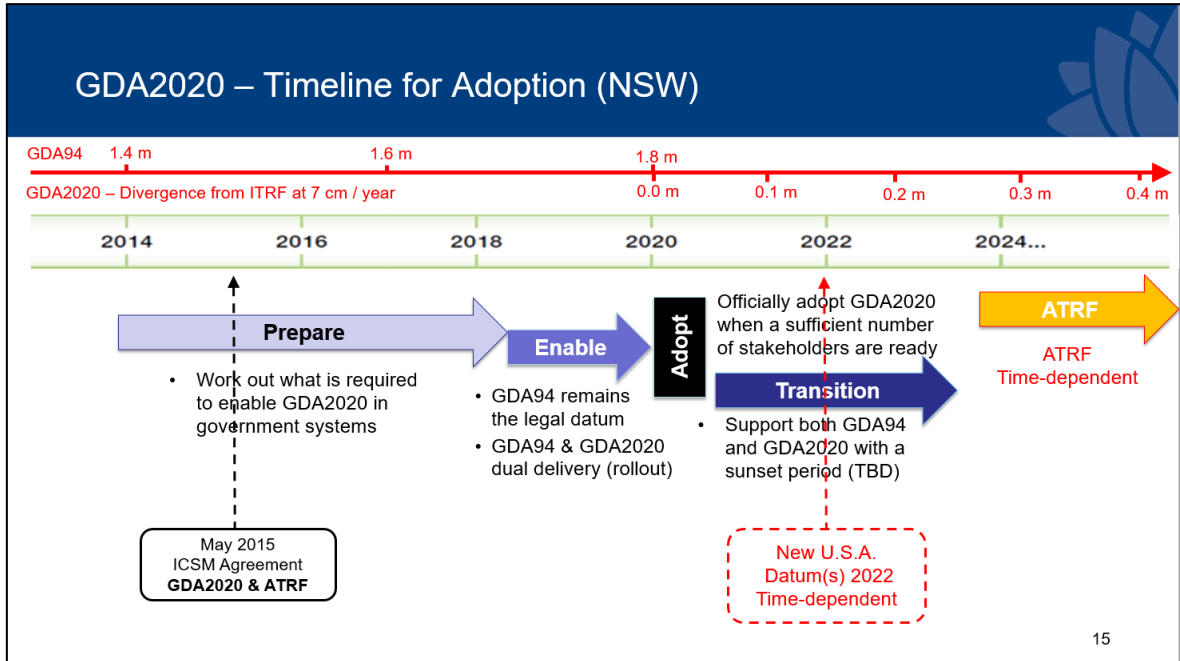
TS3663 GDA2020

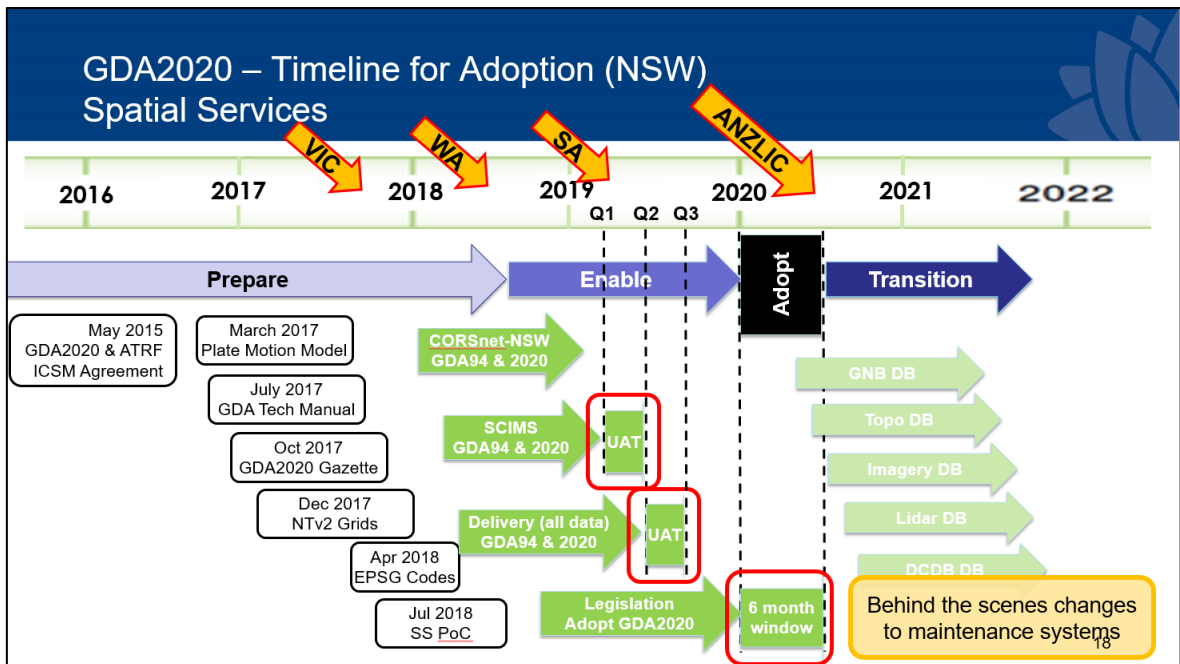
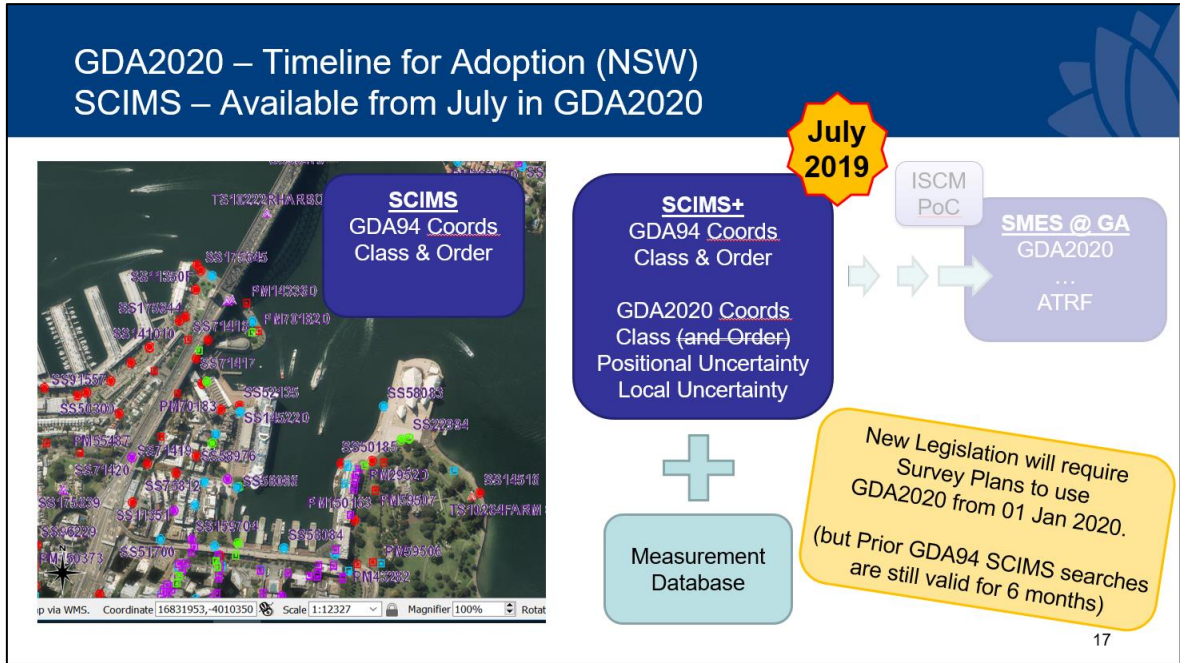
TS3663

Keep GDA94 data in GDA94
 Keep GDA2020 data in GDA2020

Use software to transform 'on-the-fly'

14





Questions to ask within your organisation

- What level of knowledge do we currently have about GDA2020 (and ATRF)?
- What do we want to know about GDA2020 (and ATRF)?
- Do we have the knowledge and/or software to transform our existing datasets?
Have we tried to access and/or use available transformation tools?
- From whom do we source spatial data?
To whom do we provide spatial data?
What spatial data do we hold?
 - In what format(s)?
 - Who is the custodian?
 - What software for visualisation and manipulation?
 - Where is the metadata for the datum? For positioning quality?
 - When would we be ready to receive GDA2020 datasets?

19

Questions? Comments!



non



- Talk to the surveyors in your organisation
- Visit the ICSM forum and FAQs pages:
www.icsm.gov.au/datum/gda2020-forum
- email: GDA2020@finance.nsw.gov.au
- Transformation grids: https://github.com/icsm-au/transformation_grids
- Online transformation service: <http://positioning.fsd.org.au/>

20