



Collaboration, Innovation and Resilience: Championing a Digital Generation

Brisbane, Australia 6-10 April

The Australian Geospatial Reference System: a modern foundation for precise positioning

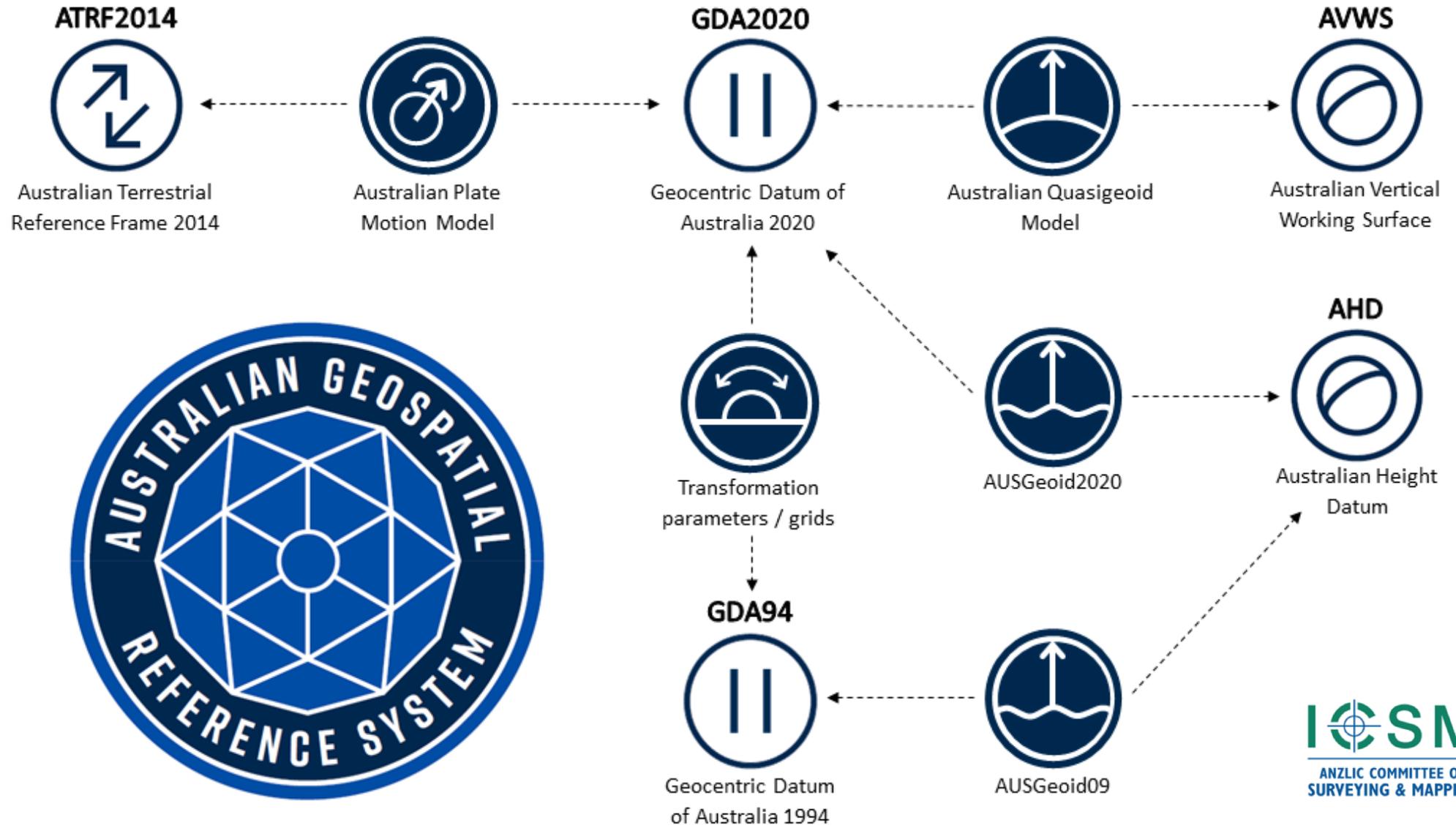
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Geoscience Australia

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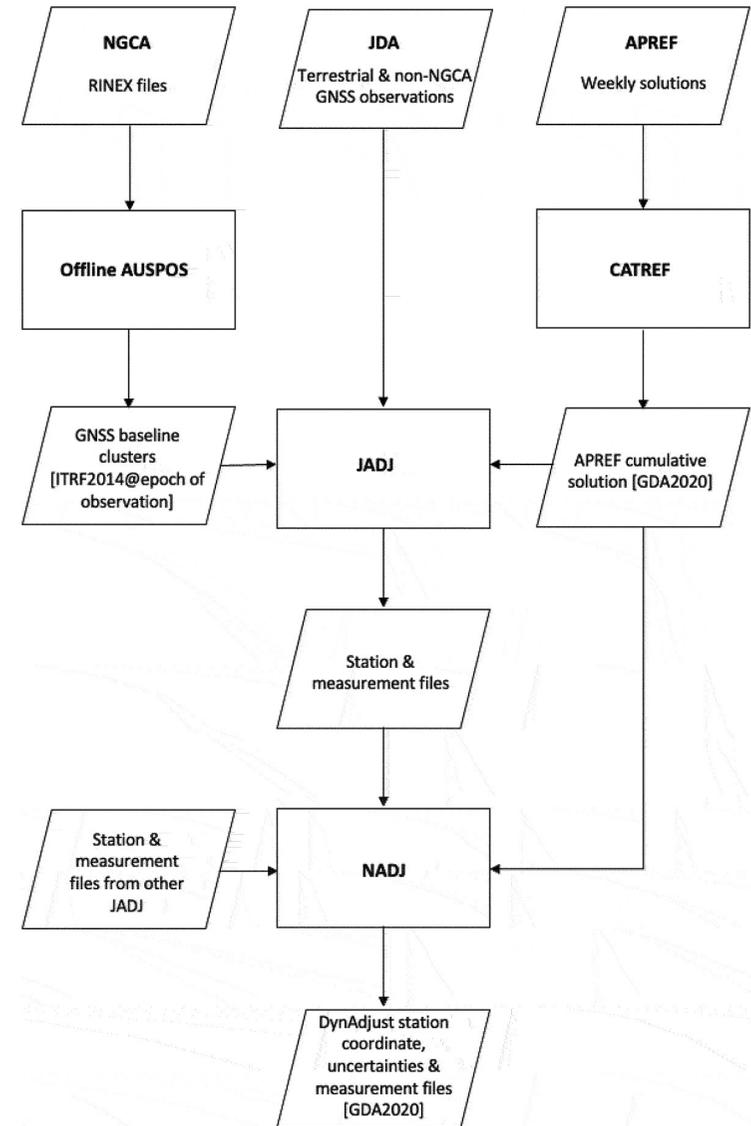
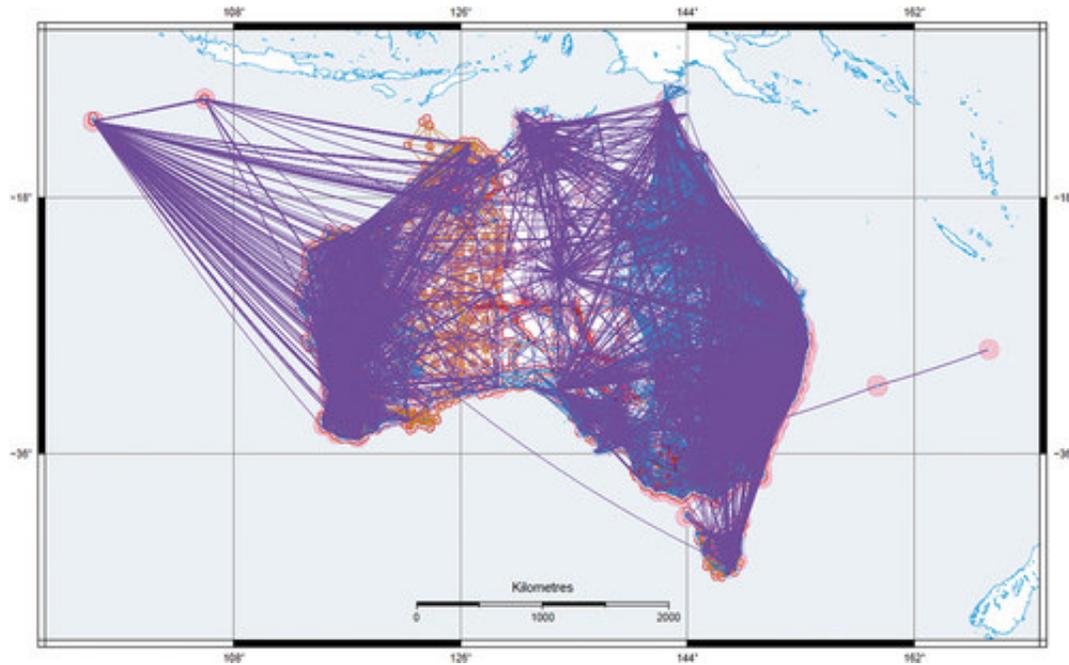
PLATINUM SPONSORS





GDA2020 update process

Purpose: Produce a distortion-free, rigorous and up-to-date coordinate set for the Australian geodetic network.



National GNSS Campaign Archive (NGCA)



High-Quality Observations: NGCA is a collection of high-quality, 6-hour plus GNSS observations maintained by Geoscience Australia.



Cloud Transition: Recent work has moved the Archive to the cloud and created a user portal.



Jurisdictional Control: Jurisdictions have full control of their archive and can submit data collected by surveyors directly into the NADJ.



Workflow Integration: This service is popular with jurisdictions, who have integrated the processing into their workflows.



Files

ACT NSW NT QLD SA TAS VIC **WA**

Metadata Files

Filename	Last Updated	Actions
Ignore File	15-07-2022 08:51:56	Add Rollback
Near File	06-10-2022 14:07:25	Add Rollback
Renaming File	15-07-2022 09:13:44	Add Rollback
Translation File	07-07-2022 11:29:16	Add Rollback

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RINEX Files

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Page size: 100

Filename	Size	Date Modified
01WK2410.12O	5.6 MB	18/11/2024 04:51pm
6375_1731908116375-99999999.pdf	814.6 kB	18/11/2024 04:51pm
APS122410.SNX	52.2 kB	18/11/2024 04:51pm
APS122410.SNX.GDA20	38.6 kB	18/11/2024 04:51pm
APS122410.SNX.GDA20.GDA94	38.6 kB	18/11/2024 04:51pm
01WK2420.12O	6.8 MB	23/07/2024 01:05pm

User Portal



AGRS: National Adjustments Future work plan



Build

- Complete external-facing web portal and API development for the stakeholders for authenticated data submission and results retrieval.



Test

- Test single-mark baselines to enhance accuracy and troubleshoot coordinate issues.



Automate

- Implement automated code deployment in the AWS production environment.



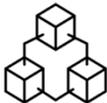
DynAdjust uplift

- Refactor DynAdjust scripts, integrating open-source linear algebra and matrix manipulation tool. Optimize DynAdjust compilation speed for improved performance.



Integrate

- Build static binaries for DynAdjust to simplify cross-platform installation.



Release

- Release an updated GeodePy with a generalized transformation tool and Jupyter notebook support.



DynAdjust: least-squares adjustment application

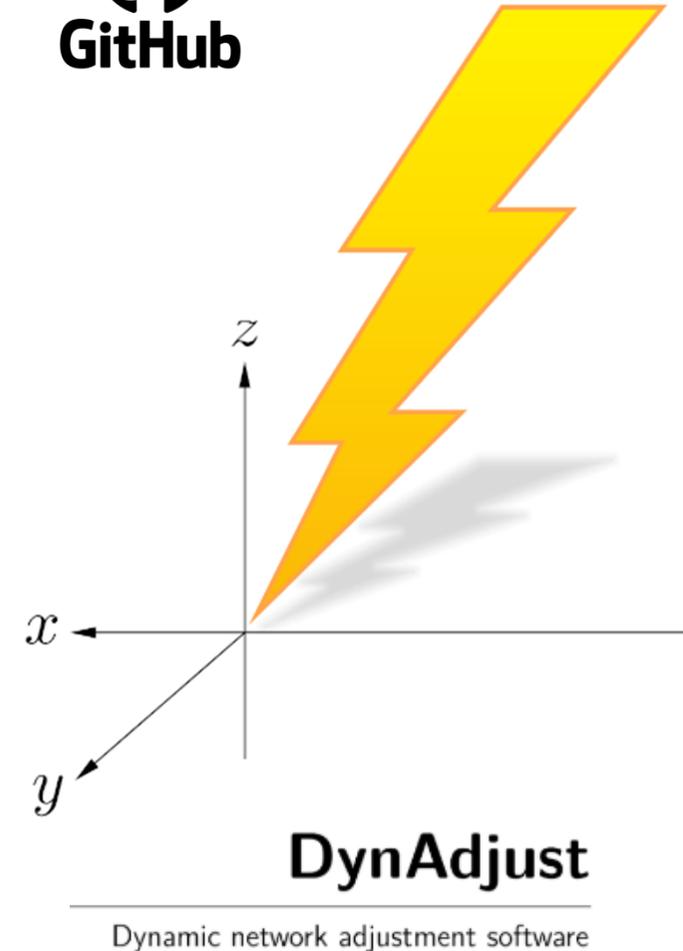
Purpose:

- Generate rigorous coordinates and uncertainties from a continental-sized geodetic network.

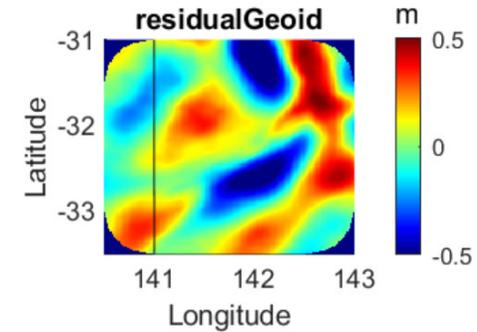
Key Benefits:

- Efficiency: Automatically segments the network into blocks, improving performance.
- Adaptability: Adjusts to continual station and measurement changes.
- Scalability: Handles 2.5 million measurements and 340,000 stations.
- Precision: Produces accurate coordinates and positional uncertainty.
- Performance: Runs on a compute-optimized AWS instance, minimizing RAM usage.

<https://github.com/GeoscienceAustralia/DynAdjust>



Online tools and code repositories



GitHub:

- <https://github.com/GeoscienceAustralia/GeodePy>
- <https://github.com/GeoscienceAustralia/analysis-ready-gravity-data-workflow>



GeodePy

AGRS online tools:

<https://geodesyapps.ga.gov.au/avws>

Australian Government
Geoscience Australia

Geodetic Calculators

Home Australian Vertical Working Surface Batch Processing Feedback

Australian Vertical Working Surface

The Australian Vertical Working Surface (AVWS) is a new reference surface for heights in Australia. AVWS is a gravity model that provides the offset between the ellipsoid and quasigeoid. If you are after the offset between the ellipsoid and the Australian Height Datum then you should use one of the AUSGeoid models. AVWS heights can be computed directly from GNSS without needing to connect to survey mark infrastructure with accuracy of 4-8 cm. This tool can transform between ellipsoidal and AVWS heights and supplies uncertainty estimates. The conversions are valid for latitude and longitude coordinates between 8(S) to 61(S) and 93(E) to 174(E). The input coordinate format is decimal degrees.

Latitude: * 23.445567853° Hemisphere: * South

Longitude: * 134.445567853° Hemisphere: * East

Type of height: * Ellipsoidal AVWS

Height (in metres): * 5543.325m

Clear Submit

Summary



- AGRS establishes parameters for latitude, longitude, and elevation throughout Australia, encompassing the necessary infrastructure, models, tools, and standards for precise positioning.
- GDA2020 updated bi-monthly leveraging cloud infrastructure & agile methodologies. Key processes:
 - National GNSS Campaign Archive (NGCA): A repository of high-quality GNSS observations that are maintained and available through a user portal.
 - National Least-Squares Adjustment (NADJ): updates the GDA2020 coordinate set utilizing 2.5 million measurements from 340,000 stations.
- Collaboration through State & Territory Governments, academia, ICSM and international communities (incl. UN-GGIM Subcommittee on Geodesy) are key.
- Future Development: AGRS will continue to evolve, making use of advanced computing capabilities and engaging with stakeholders.

The most relevant SDGs related to the presentation and theme of this session

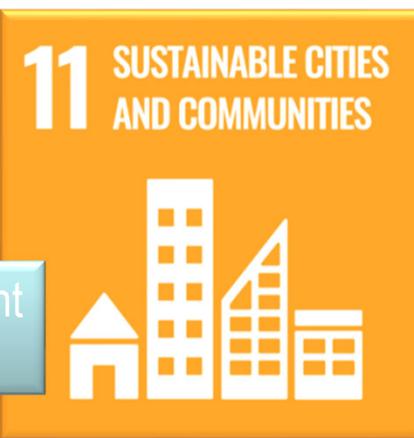
1st relevant SDG



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



2nd relevant SDG



11 SUSTAINABLE CITIES AND COMMUNITIES



3rd relevant SDG



13 CLIMATE ACTION



SUSTAINABLE DEVELOPMENT GOALS

International Federation of Surveyors supports the Sustainable Development Goals



Australian Government
Geoscience Australia

Positioning
Australia

Further information



geodesy@ga.gov.au



<https://www.ga.gov.au/scientific-topics/positioning-navigation/positioning-australia/geodesy/australian-geospatial-reference-system>



<https://www.icsm.gov.au/australian-geospatial-reference-system>



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