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

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SUMMARY

The Australian Geospatial Reference System (AGRS) is comprised of the datums used to define latitude, longitude and height throughout Australia; the infrastructure that realises these datums; the models that describe how they work; the tools to work with the system; and the standards that ensure interoperability. It contains all that is needed to perform modern, high-accuracy, positioning work in Australia. It is an excellent example of what can be achieved when a project focuses on innovation while also fostering collaboration. This presentation will give a brief overview of the AGRS, describe some recent improvements, and flag some areas for future development. It will then focus on the bi-monthly GDA2020 update process as a good illustration of how to make use of cutting-edge compute capabilities and Agile development methodologies to create products that are both easy to use and resilient. Specifically, it will focus on two parts of the process: the national least-squares adjustment (NADJ) to update the GDA2020 coordinate set; and the National GNSS Campaign Archive (NGCA) processing. The NADJ is run bi-monthly on cloud infrastructure hosted by Amazon Web Service. The GDA2020 coordinate set is updated via a single least-squares adjustment of the national geodetic network, a first for an Australian datum. The adjustment uses 2.5 million measurements to estimate coordinates for almost 340 thousand stations, and this is only possible due to the phased adjustment capabilities of DynAdjust – the least-squares adjustment software used. The NGCA is a collection of high-quality, 6-hour plus GNSS observations, which Geoscience Australia maintains on behalf of the jurisdictions. Recent work has seen the Archive move to the cloud and the creation of a user portal, which gives the jurisdictions full control of their archive. This service is very popular with the jurisdictions, who have built the processing into their workflows and can now submit data collected by surveyors directly into the NADJ. The development of the AGRS is a triumph of collaboration with all state, territory and Commonwealth governments working together to resolve a challenging problem and deliver an authoritative foundation for high-accuracy positioning.
