Upgrades to the Australian Geospatial Reference System

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ABSTRACT

The Australian Government has committed $225 million to provide 5-10 cm accurate positioning to anyone, anytime, anywhere in Australia. This is a significant improvement from the 5-10 m accuracy you can currently achieve using Global Navigation Satellite System (GNSS) enabled devices. In anticipation for the growing use and reliance on positioning technology, the Intergovernmental Committee on Surveying and Mapping's Permanent Committee on Geodesy (ICSM PCG) is working to ensure we have the datums (GDA2020), reference frames (Australian Terrestrial Reference Frame, ATRF), working surfaces (Australian Vertical Working Surface, AVWS), models (e.g. AUSGeoid) and standards (e.g. GeodesyML) implemented as part of the Australian Geospatial Reference System (AGRS) to make best use of precise positioning. This includes delivering on the commitments of the Positioning theme of the Foundation Spatial Data Framework (FSDF) and the Geoscience Australia Positioning Program. Furthermore, these upgrades will underpin key strategic priorities of Digital Earth Australia, Cadastre 2034, Building Information Modelling (BIM) and the Spatial 2026 Agenda including the creation of a 4D cadastre underpinned by a coordinate system with a time-dependent reference frame and improved spatial accuracy (particularly in height). With a focus on improving the AVWS, airborne gravity surveys are proposed for areas in Eastern Victoria and state-wide coverage of NSW during 2022. The objective of these surveys is the collection of consistent and evenly distributed airborne gravity data over regions of interest. This data is required to significantly improve the gravity data over these priority regions to enhance the gravity model (known as the gravimetric quasigeoid model) and improve height determination from GNSS positioning. It will also assist geoscience researchers to further develop their understanding of the geological 'architecture' and how it has evolved over time. The current version of the gravity model has an uncertainty of 5-8 cm, and the airborne gravity data will reduce this uncertainty to 1-3 cm. Enhancing the gravity model will also significantly improve height determination from GNSS positioning. This presentation outlines these developments and provides an overview over current activities to further improve the AGRS.

KEYWORDS: *Datum, reference system, GDA2020, ATRF, AVWS.*