

Progress Towards a New Geodetic Datum for Australia

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Key words: Deformation measurement; GNSS/GPS; Positioning; Reference frames; Reference systems; Remote sensing;

SUMMARY

For several years, the government jurisdictions that comprise the Permanent Committee on Geodesy (PCG) of the Intergovernmental Committee on Surveying and Mapping have been undertaking preparatory work for a new geodetic datum for Australia. A modernised datum is required to support the ever-increasing accuracy needs of the geospatial community. Many applications are beginning to utilise absolute positioning techniques, which provide positions in terms of the International Terrestrial Reference Frame (ITRF). Any new datum needs to efficiently support these emerging positioning technologies, which provide dynamic positions that need to be integrated with the static spatial data used in digital maps. Consequently, rigorous accounting for crustal dynamics is essential in a modernised geodetic datum, even for a stable continent such as Australia. Work to prepare for a new dynamic datum, tentatively scheduled for release in 2020, is well underway. It is proposed that the datum will be aligned with the latest version of ITRF, through the regional realisation provided by the Asia-Pacific Reference Frame (APREF). Crustal dynamics will be incorporated using a deformation model. The datum will be designed to adapt quickly to the availability of new measurements and better models, ensuring that it remains fit-for-purpose even as technology and applications continue to advance. One of the key features of the modernised datum will be the creation of a seamless national network of all geodetic marks, down to ‘street level’ control. These marks currently have their coordinates calculated by the responsible state or territory, introducing discontinuities at the borders due to differences in methodology. In the modernised datum, each jurisdiction will provide its measurements and metadata to create a national dataset from which hundreds of thousands of homogenous coordinates will be generated using rigorous least squares estimation software operating on high-performance computing infrastructure. This national approach will also ensure strong connections to the national continuously operating reference station (CORS) network, enable the correction of distortions in the existing datum, and for the first time enable the rigorous calculation of uncertainty. This paper will discuss the technical aspects of the proposed new datum, and the progress made to date. It will also outline future steps, including decisions still to be made. Finally, it will include details of the user consultation that has been carried out to help determine the requirements of a modernised geodetic datum.