

Teaching Modern Geodesy

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SUMMARY

Geodesy is enjoying a golden period. A myriad of new geodetic devices are sensing ever finer dynamics of the Earth system to unprecedented precision. Geodetic products now underpin services used by a growing number of users and are permeating into the main stream. For example the Intergovernmental Panel on Climate Change 5 yearly reports rely on the reference frames provided by international geodetic services and even the United Nations now recognises geodesy as fundamental to much of its operations evidenced by the establishment of the UN-GGIM.

Nationally Australia is modernising its datum. CORS networks are enabling high precision GNSS surveying, GNSS heighting is improving and regulations are being updated to accommodate new techniques. Laser scanning (terrestrial and airborne), UAV topographic products and national foundational datasets are available for modern surveyors to use in their daily operations.

What therefore should the modern academic be teaching the new cohort of students in geodesy? Classical geodesy and the history of datums are important to appreciate the historic legacy, but datum modernisation is crucial in the wake of datum modernisation in Australia. Some basics such as time systems and satellite orbits should always be included in a geodesy course, especially now that satellite geodesy techniques are so entrenched. But the course is now very crowded.

This paper will ponder which topics of geodesy should be taught. What skills should a recent graduate surveying student possess upon graduation? Where should the emphasis lie and what topics should just offer exposure? Documents local to Australia and even the state of New South Wales should be covered as well as an understanding of data formats such as RINEX 2/3, RTCM, NTRIP, NMEA and SP3. RTK-GNSS, network RTK, CORS networks, multi-GNSS and PPP are all very detailed topics. How much should a student know? Is there still value in providing a practical

GNSS baseline processing exercise with a rapid static, multi-session project and network adjustment?

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