

# FRONTIER S I >

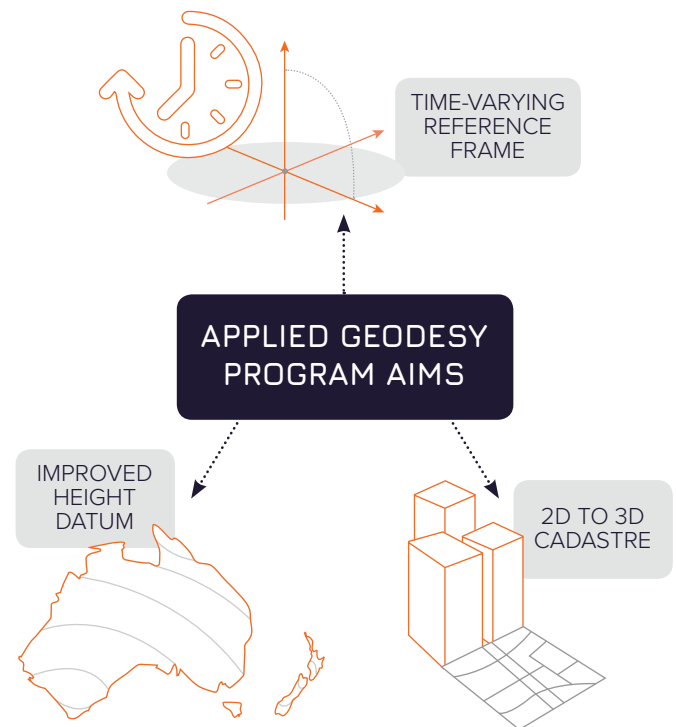
## APPLIED GEODESY



### GEODESY FOR EVERYBODY

Global Navigation Satellite Systems (GNSS) have catapulted the esoteric science of geodesy into the mainstream. Today, it's not just geodesists who need to apply geodetic principles to solve complex problems. Anyone using GNSS to navigate and locate themselves implicitly depends on the underlying science of geodesy. Otherwise, they cannot ensure satellite-derived information aligns seamlessly, accurately and reliably to their environment. Nor can they be certain such data supports what they need, be it surveying, providing direction and position or calculating boundaries for property.

Our Applied Geodesy program will provide the research capability needed to help partners develop practical and dependable solutions to the underpinning and often invisible problems of geodesy. We are aiming to shield non-expert users from complex geodetic issues while simultaneously providing a rigorous and reliable geodetic infrastructure to realise our vision of “*Geodesy for everybody.*”

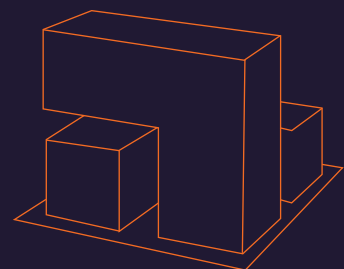


### THEMES

- **Transition to a dynamic datum** – how to create, manage and disseminate dynamic coordinates to appropriately service the needs of a diverse user community.
- **Vertical datum modernisation** – how to optimally harmonise and uniformly reference height and depth data on land and at sea.
- **Cadastral reform** – how to enhance the digital cadastre to deliver fit-for-purpose accuracy, simplify and bring efficiency to ongoing maintenance and deliver broad functionality to users.

### OUTCOMES

- A seamless and efficient transition to the dynamic datum.
- A fit-for-purpose reference system for consistently managing height and depth data.
- A federated, 3D cadastre supporting wide-spread use and delivering significant efficiencies.



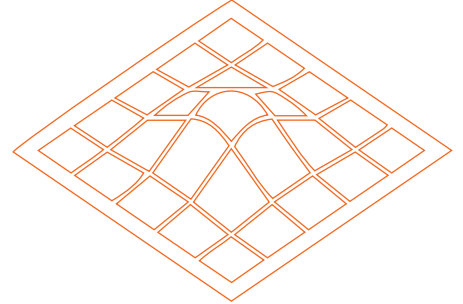
# OUR CONTRIBUTION

The Applied Geodesy program is a new addition to our research portfolio, stemming from needs articulated by partners. However, we have been involved in geodetic research since our beginnings. For 15 years we have played a key role in addressing many of the fundamental technical challenges associated with the realisation of a dynamic datum. Our research has armed geodetic agencies with a world-leading dynamic adjustment capability, has explored the inclusion of non-traditional observation types to aid the development of crustal deformation/plate motion models and has contributed to identifying technical, institutional and legislative challenges to the adoption of time-dependent coordinates.

We have also conducted research to support the generation of a new national geoid model which includes world-first uncertainty estimates to give users confidence when deriving Australian Height Datum information from GNSS.

The new Applied Geodesy program will build on these innovations, specifically focussing on three areas:

1. Generation, propagation and maintenance of dynamic coordinates. Transition to this new 4D world will raise many questions that will require substantial effort to resolve. We will assist partners to design and create the needed workflows and tools to efficiently make this transition while minimising the operational impact on users.
2. Exploring the need for a modernised height system and comparing and evaluating the technical options for deriving and referencing height and depth information on land and at sea.
3. Delineating and addressing the research challenges that will allow land agencies to deliver a more accurate, up-to-date, federated, 3D digital cadastre, supporting a wide range of existing and emerging applications.



## AIMS

- Deliver practical outcomes to the fundamental geodetic challenges that impact on the widespread use of spatial information and spatial technologies across sectors as disparate as transport, robotics, location-based services and agriculture.
- Assist partners, prepare for and effect the transition to a dynamic datum via the most efficient and robust route.
- Provide the technical expertise needed to assess options for capturing and referencing height and depth information in ways optimally suited to user needs and in line with ICSM's national strategy – *Elevation and Depth 2030*.
- Support partners in the realisation of ICSM's *Cadastre 2034* vision by solving the technical challenges that impede the creation of a federated 3D digital representation of the cadastre.

## RESEARCH OUTPUTS

- Tools, processes and educational materials to support the transition to a dynamic datum.
- Technically validated options and recommendations for vertical datum modernisation.
- Resolution to the impediments of creating a 3D, federated cadastre.

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We know where.

### FOR MORE DETAILS CONTACT

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