

# Australia's big challenges – the role of geoscience

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Australia as a very large but sparsely populated continent has always been shaped by its geology and geography. As the nation responds to the many challenges it faces at this time, Geoscience Australia (GA), as the Government's advisor on geoscience is focussing on three key challenges as the drivers for its work. These themes are future minerals and energy resources; community safety and environmental baselines, including groundwater; and change in the geographies of the nation.

In relation to the discovery of future minerals and energy supplies Australia has not been globally competitive for minerals exploration investment for over a decade and consequently requires new search areas if it is to regain its former standing as a desirable environment for mineral exploration activity. To help address this issue, GA in partnership with the State and Territory Geological Surveys, is undertaking a major program to reveal the basement geology and potential of Australia's covered terranes. In relation to energy resources GA has a three-pronged strategy designed to reveal the hydrocarbon potential of Australia's conventional and unconventional petroleum resources. This work involves basin analysis of offshore basins, regional studies and targeted petroleum systems studies for onshore basins.

GA has, or is undertaking, a wide range of groundwater studies to inform the management of issues like the water production from Coal Seam Gas developments, new and future water supplies for remote communities, and strategic assessment of the potential groundwater resources in the arid regions of Australia.

Our Community Safety and Earth Monitoring program encompasses a wide range of natural hazards and their potential impact on communities both within Australia and in the region. This work includes the development of a flood portal to provide information to the community on flood risk and has led to the development of the first ever national flood water map of the entire continent. In addition, GA is involved through Australian aid activities in the provision of natural hazard risk and impact studies in Indonesia, the Philippines and PNG.

GA is building the next generation of positioning infrastructure which will have a very wide range of industrial and business applications but will also enable major research into the deformation of the Australian continent from both natural and human activities. This work has the potential to inform the processes that drive intraplate earthquakes and provide a much improved understanding of earthquake risk in Australia.

GA has, through a major program over the last few years, found a way to liberate our satellite imagery archive, rectify it and interrogate it so that it is now possible to examine change through time in the Australian landscape. This work provides, for example, a mechanism to establish robust environmental baselines, monitor water in the landscape and monitor vegetation health including crops and recovery of the landscape after major floods or fire.

The presentation will canvass these major challenges and present examples of the science that is being undertaken to help inform government decision makers.