

Ancient rock collisions may have formed Western Australia

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A new 3D picture of the geology of Western Australia, captured by measuring seismic waves from deep in the Earth's crust, has provided evidence that it was created when vast regions of ancient world slammed into each other.

Using a high concentration of seismic stations located all over remote parts of the Western Australia outback, Dr Anya Reading and colleague Professor Brian Kennett from the Research School of Earth Sciences have developed the clearest picture yet of the geology of the ancient rocks in the region, some of which date back 3.5 thousand million years.

Seismic stations measure the energy waves that reverberate throughout the Earth's crust after earthquakes. The waves travel through different types of rock at different speeds, and by analysing the measurements of these velocities through the seismic stations, researchers can 'map' the underlying geology.

"Essentially, we get a picture of the geological structure of the deep crust through differences in the waveform 'wiggles'," Dr Reading, who is now based at the University of Tasmania, said.

The data the team obtained showed that the rock types of the different 'crustal blocks' that make up this ancient region are consistent across particular regions of the Earth's crust.

"We found there were very clear delineations between the blocks of

certain types of rock that make up the region, suggesting to us that these crustal blocks slammed together,” Dr Reading said.

The research team, including senior technical officer Steve Sirotjuk, collected the comprehensive 3D data by deploying more seismic recording stations across the region than had been before, giving more comprehensive data on the deep geology of the region.

“Although more work is needed to confirm how this ancient – and resource rich – area of the world formed, it is clear that this method of seismic station deployment could be used to get more accurate data about the deep geology of the Earth in other parts of the world,” Dr Reading said.

Source: ANU

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