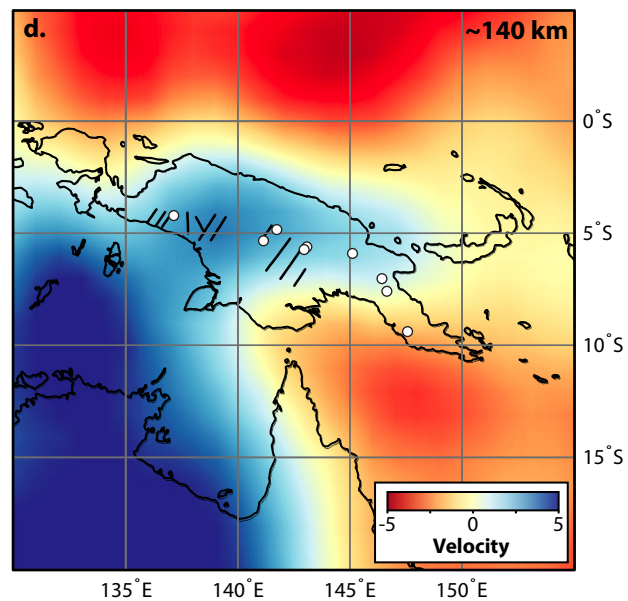
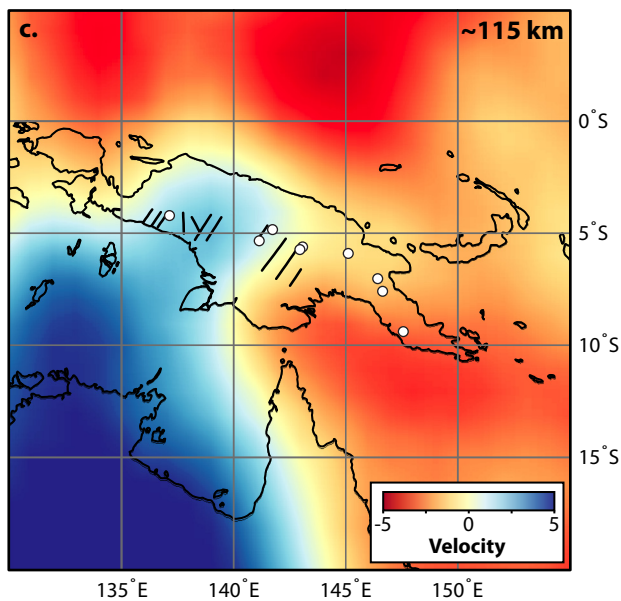
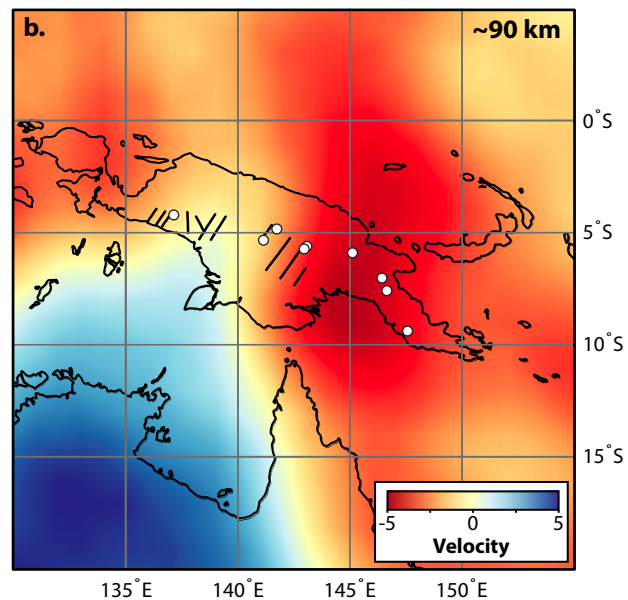
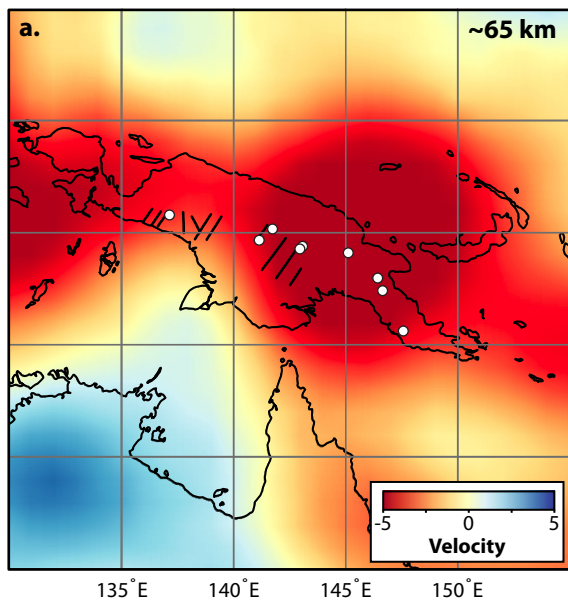
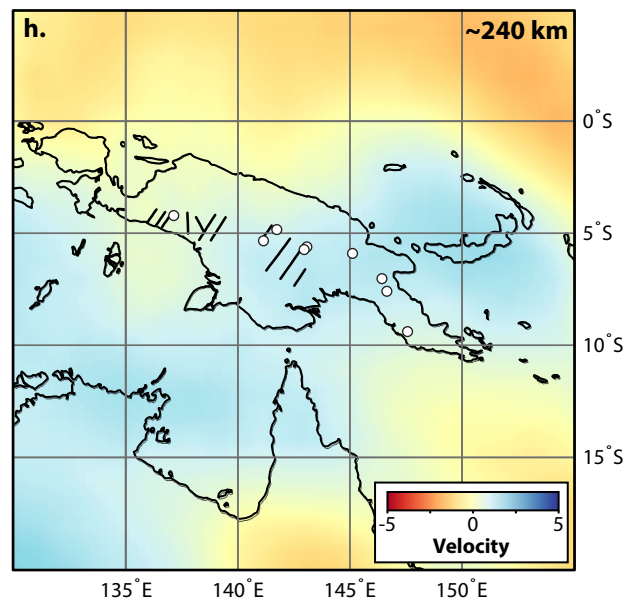
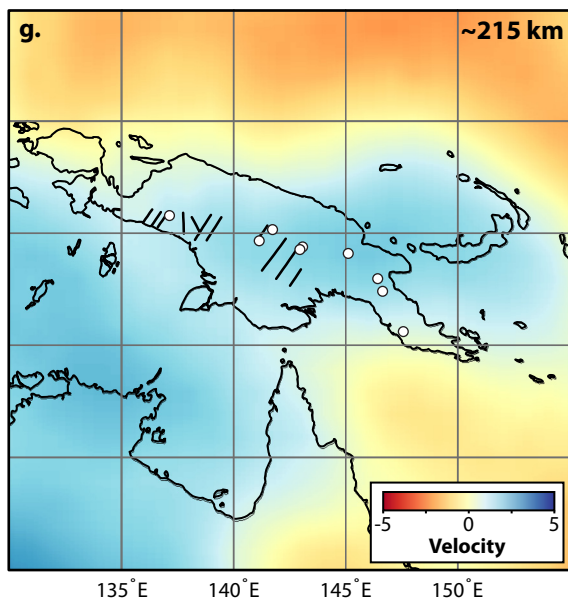
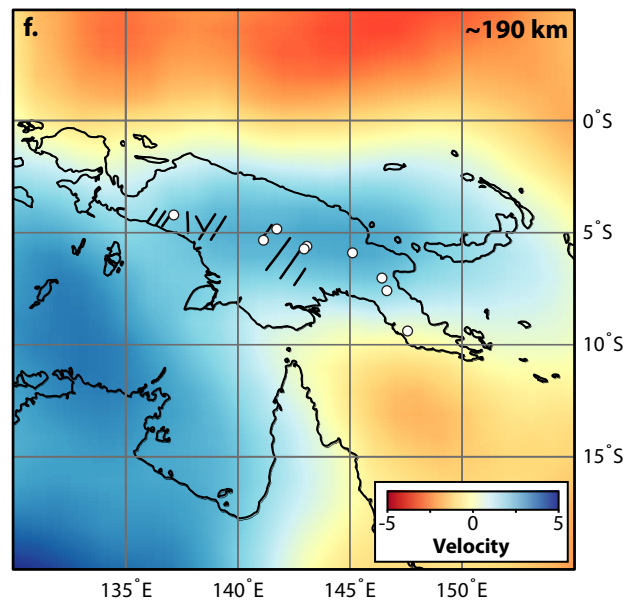
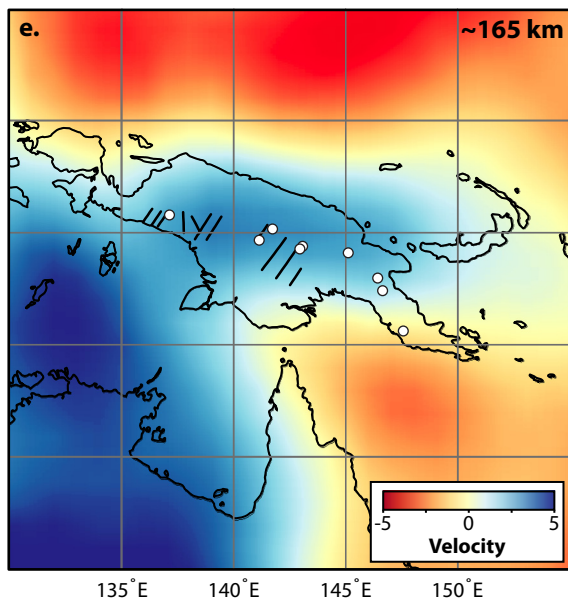


Low

Magnetic field intensity (nT)

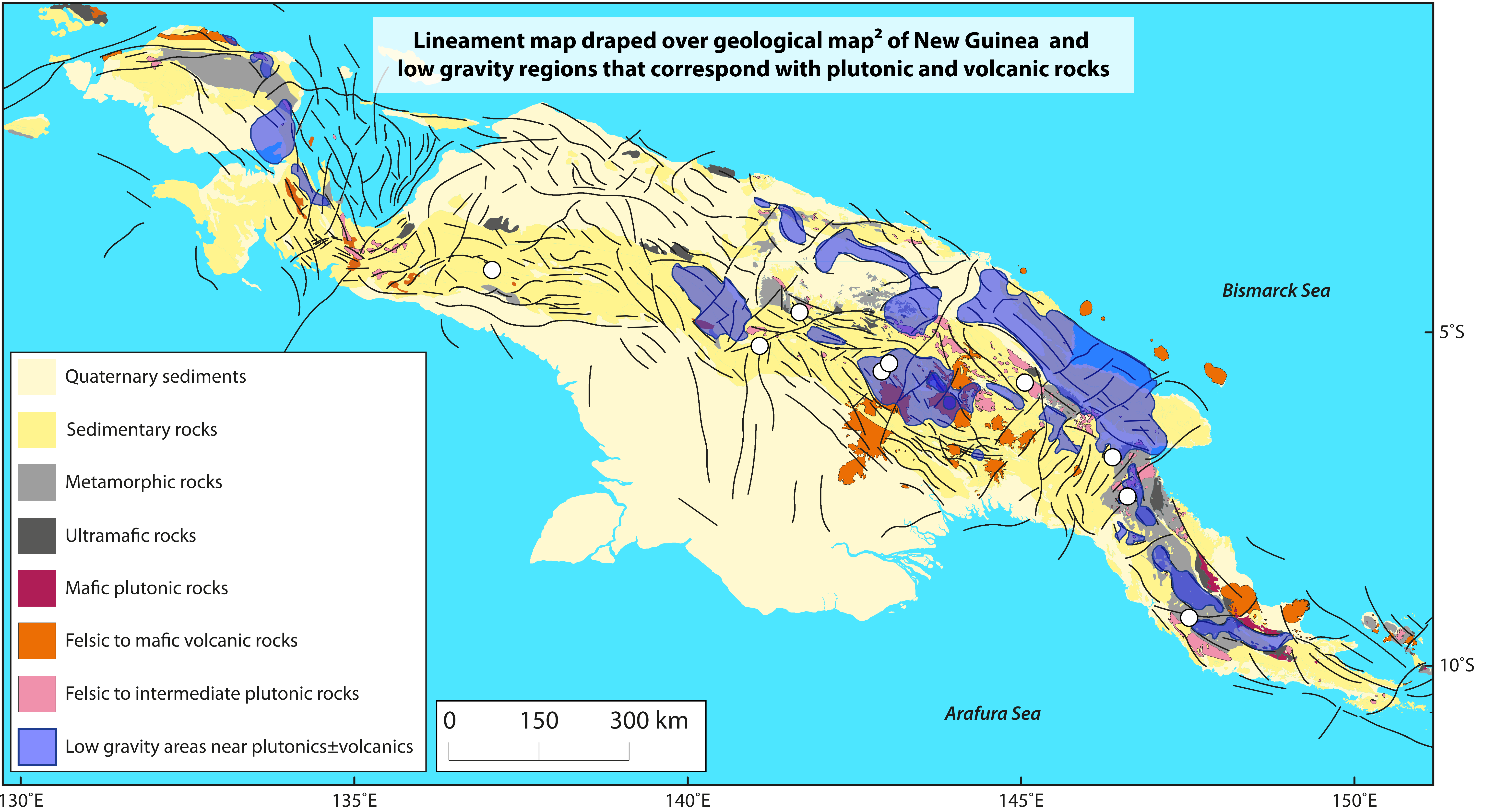
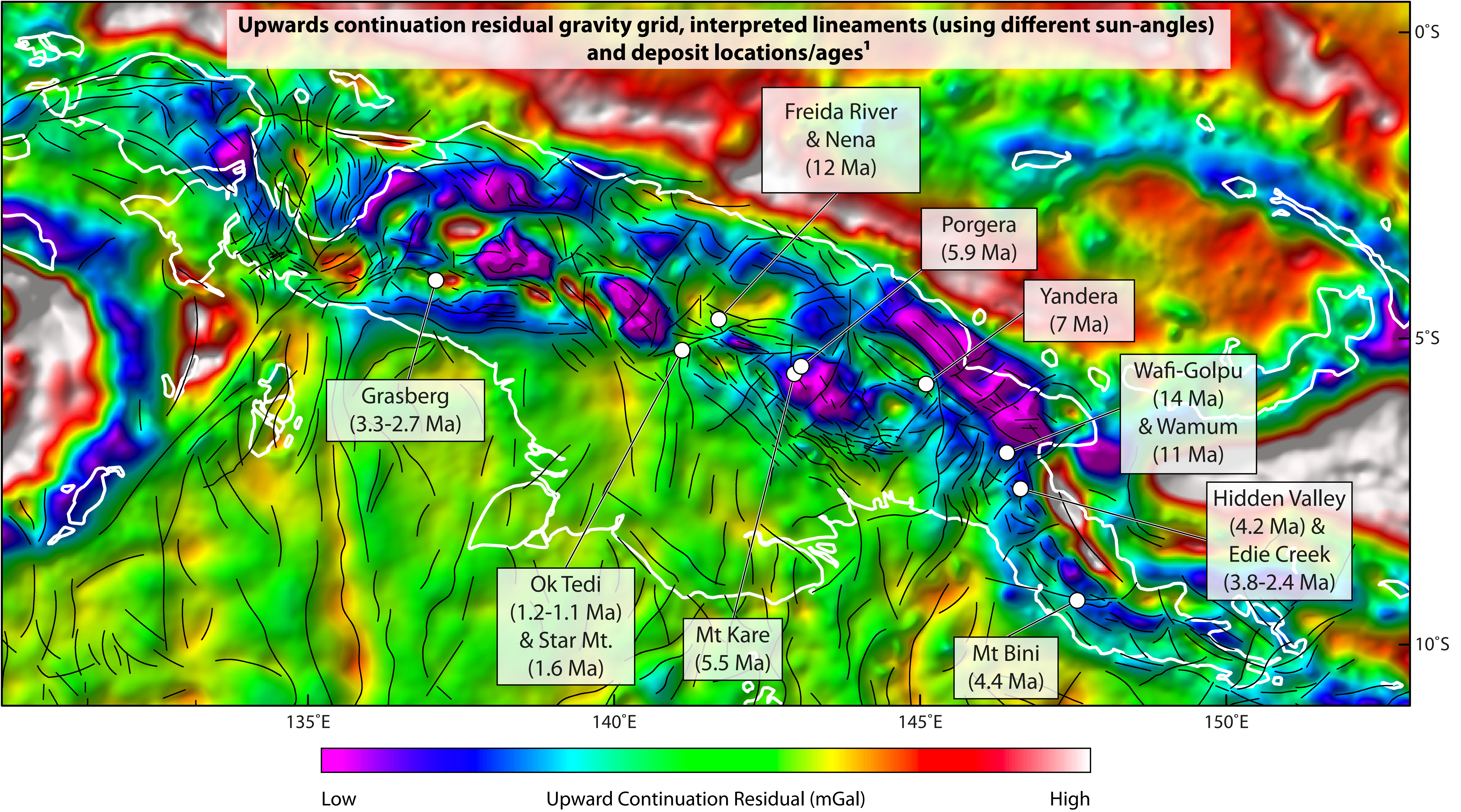
High





Lithospheric-scale structures in New Guinea and their control on the location of gold and copper deposits

L. T. White, M. P. Morse and G. S. Lister (2014) in *Solid Earth*



Abstract

The locations of major gold and copper deposits on the island of New Guinea are considered by many to be controlled by a series of transfer faults that strike N-S to NE-SW, perpendicular to the long axis of the island. The premise is that these faults dilate perpendicular to the regional stress field, forming conduits for metalliferous bearing gases and fluids to drop out of solution. However, the data on which this idea was first proposed was often not presented, or when the data were presented, were of poor quality or low resolution. We therefore present a review of the existing structural interpretations and compare these with several recently published geophysical datasets to determine if the mineralization controlling transfer faults could be observed. These data were used to produce a new lineament map of New Guinea. A comparison of the lineaments with the location of major gold and copper deposits indicates there is a link between the arc-normal structures and mineralization. However, it is only those deposits that are less than 4.5 million years old that could be associated with these structures. Gravity and seismic tomography data indicate that some of these structures could penetrate deep levels of the lithosphere, providing some support to the earlier idea that the arc-normal structures act as conduits for the younger mineral deposits of New Guinea. The gravity data can also be used to infer the location of igneous intrusions at depth, which could have brought metal-bearing fluids and gases closer to the Earth's surface. These regions might be of interest for future exploration campaigns, particularly those areas that are crosscut by deep, vertical faults. However, new exploration models are needed to explain the location of the deposits that are older than 5 Ma.

References

- Garwin, S., Hall, R., and Watanabe, Y.: Tectonic setting, geology and gold and copper mineralization in Cenozoic magmatic arcs of Southeast Asia and the West Pacific. *Economic Geology* 100th Anniversary Volume, 891-930, 2005.
- Coordinating Committee for Geoscience Programs in East and Southeast Asia (CCOP) 1:2,000,000 geological map of SE Asia (downloaded from <http://www.orrbodies.com/resources/item/orr0052>)



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