



## **Connecting the Bird's Head to the Bird's Body – Cenozoic arc magmatism extends along the length of New Guinea.**

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New Guinea has a long, complicated history of arc magmatism. The present day shape of the island (resembling that of a bird in flight) formed as a result of oblique convergence of the Pacific and Caroline/Philippine plates with the northward moving Australian plate. This convergence resulted in multiple collisions of island arcs with continental crust, representing a modern day analogue to ancient accretionary orogens.

This complex geological history has formed four major tectonic belts; accreted Palaeogene island arcs, the New Guinea Mobile Belt, the New Guinea Fold Belt and a stable platform. These tectonic belts are drawn across most of New Guinea in major review papers. However, these tectonic belts are not generally considered to extend through to New Guinea's western most peninsula (the Bird's Head).

We present new field evidence, together with new U-Pb zircon geochronology and geochemical analyses from rocks collected within the Bird's Head. These document Middle to Late Miocene intermediate to felsic volcanic rocks and associated granitoid intrusives that formed along an active continental margin. These are effectively the equivalent of the Maramuni arc and Freida River Complex in eastern New Guinea. Several, broadly Eocene island arcs composed of dominantly mafic volcanic rocks are also found in the Bird's Head. These island arcs accreted along the Bird's Head sometime after their initial formation, possibly coinciding with Middle to Late Miocene active continental margin magmatism and we consider them to be equivalents of the Cyclops Mountains arc in Central New Guinea.

This work demonstrates that New Guinea's east-west terranes are more extensive than previously thought. This potentially has implications for locating future ore deposits and understanding the relative position of the Bird's Head with respect to the rest of New Guinea in major plate reconstructions.