

Blueschists accretion along the subduction interface: Insights from Diego de Almagro island (Chilean Patagonia)

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The remote Diego de Almagro Island (51° 30' S), which exposes one of the very rare vestiges of the Early Cretaceous paleo-subduction system of western South America, is constituted by two main tectonic units. The western unit is composed of a pluri-kilometre thick sequence of mafic tuffs coherently metamorphosed near the transition between blueschist and epidote-eclogite facies conditions (~500°C, 1.5-2 GPa) at ca. 120 Ma. Grt-micaschists, meta-pillow lavas (showing MORB and OIB signatures) and metacherts (now transformed to garnet-rich layers) occur within the metavolcano-sedimentary sequence. The unit is strongly overprinted during exhumation by albite-epidote-amphibolite and greenschist facies assemblages.

The eastern unit is formed by a coherent, km-thick slice made of felsic gneisses and amphibolites which contain garnet (generally concentrated in layers up to several cm-thick), plagioclase, calcic amphibole, epidote and evidences of partial melting. This unit is believed to represent a fragment of the upper plate dragged down into the subduction environment and underplated during Cretaceous times. Field observations and preliminary petro-geochronological results point to a relative coherence of units, which highlights the physical nature of the interface and provide a precise image of deformation processes taking place at mantle depths in active subduction settings.