

## **The Central Depression and Coastal Cordillera late Oligocene-early Miocene volcanism (J.M.B., R.T.V. & C.R.S.)**

In south-central Chile between 37°S and 44°S, late Oligocene-early Miocene volcanic and subvolcanic rocks are locally exposed both to the east and within the Main Andean Cordillera, as well as within the Central depression and along the coast on the western slope of the Coastal cordillera (see figure on next page). Particularly good exposures of these partially eroded Oligocene-Miocene volcanic complexes have been identified in the Los Angeles-Temuco segment within the Central Depression and along the coast on the western slope of the Coastal Cordillera at Bahía Capitanes, Caleta Estaquilla, Caleta Parga, Ancud and Guapi Quilán islands, the latter to the SW of Quellón town (see figure on next page). These exposures represent remains of individual volcanic complexes previously grouped together as the Coastal Cordillera Volcanic Belt (Vergara & Munizaga 1974), the Eocene-Miocene Central Depression Volcanic Belt (López-Escobar *et al.* 1976), the Central Depression Upper Oligocene-Miocene Volcanic Belt (Stern & Vergara 1992) and/or the Coastal Magmatic Belt (Muñoz *et al.* 2000).

Both Central Depressions and Coastal Cordillera volcanic complexes define a NNE-trending belt interpreted by Muñoz *et al.* (2000) as the late Oligocene-early Miocene volcanic front (see figure on next page).

Central Depression and Coastal Cordillera Oligocene-Miocene volcanic complexes were emplaced upon Palaeozoic-Triassic metamorphic basement and the effusive products underlie, cover or are interbedded with late Oligocene to early Miocene continental and/or marine sedimentary sequences. These relationships indicate that this magmatic activity was synchronous with the opening and/or subsidence of forearc and intra-arc continental and/or marine sedimentary basins (i.e. Temuco-Labranza, Valdivia, Osorno-Llanquihue and Chiloé basins; see figure on next page) (Cisternas & Frutos 1994; Martinez & Pino 1979; Muñoz *et al.* 1997, 2000; Elgueta *et al.* 2000).

### **K -Ar geochronology**

All available whole-rock K - Ar ages and cited localities for the Oligocene-Miocene volcanic complexes between 37°S and 44°S are shown in the figure on the next page.

Muñoz *et al.* (2000) reported K - Ar ages from 29 to 22 Ma in the Guapi Quilán Islands Complex, Sw of Quellón.

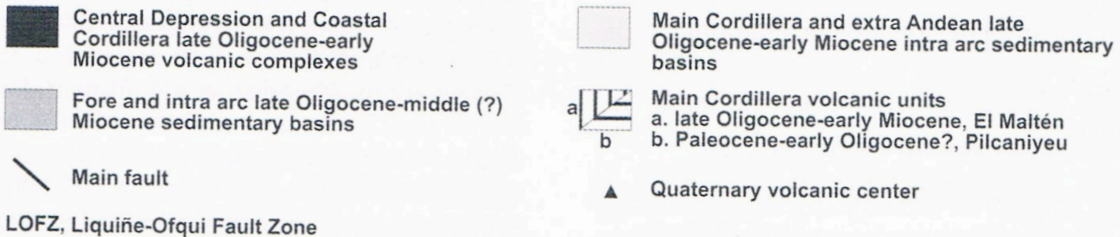
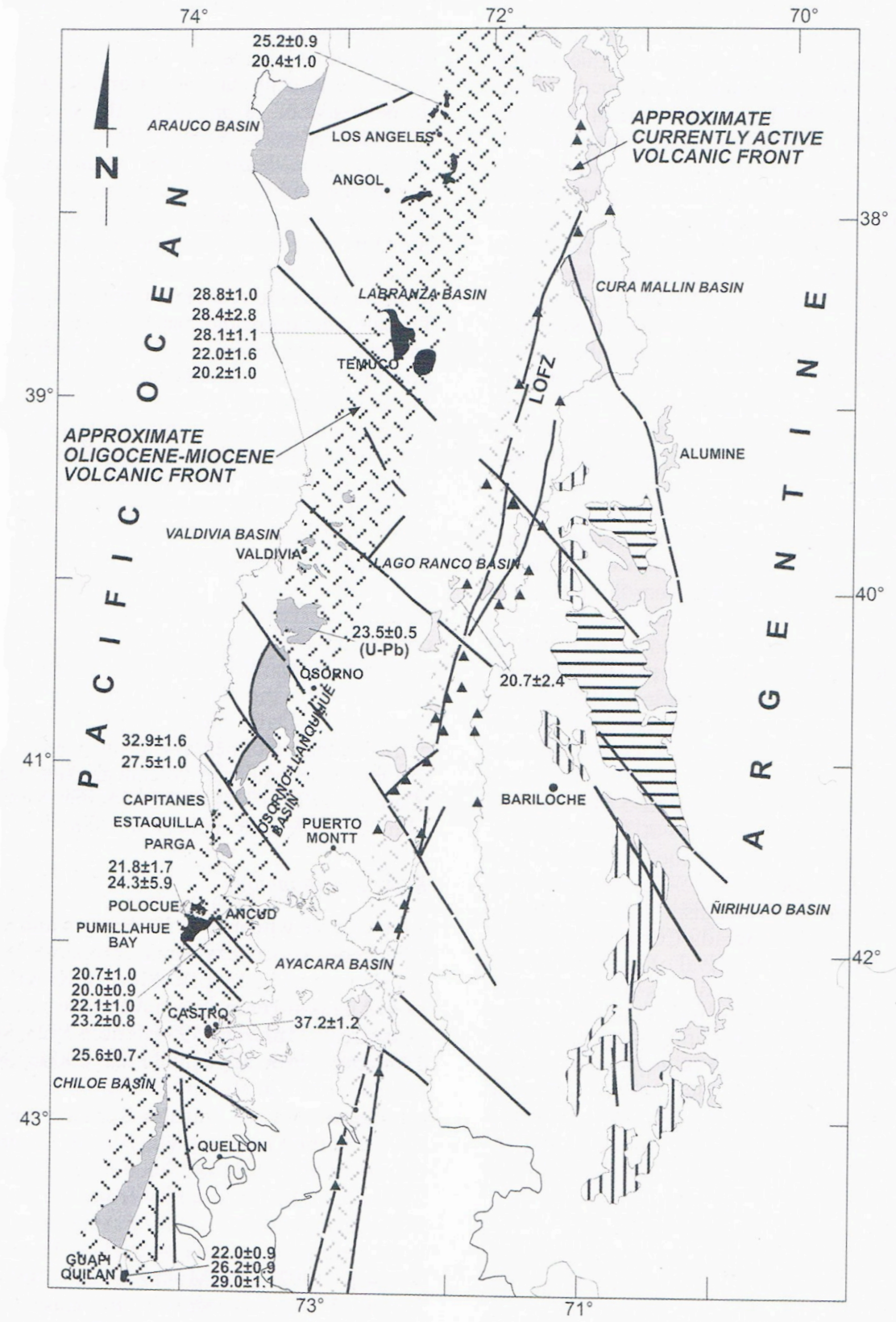
García *et al.* (1988) and Muñoz *et al.* (2000) obtained ages of 21 and 24 Ma for samples from the volcanic neck at Punta Polocué, and 20 to 23 Ma for samples in the vicinity of Ancud, both belonging to the Ancud Volcanic Complex.

Stern & Vergara (1992) and Muñoz *et al.* (2000) determined ages of 25 and 23 Ma, respectively, for glassy compacted fragments separated from rhyolitic pyroclastic flow cropping out within Ancud city.

### **Petrography**

The Ancud Volcanic Complex (Vergara & Munizaga 1974; Valenzuela 1982, García *et al.* 1988; Stern & Vergara 1992; Muñoz *et al.* 1997, 2000) includes basaltic to andesitic lava flows and volcanic necks, rhyolitic pyroclastic flows, and black-coloured obsidian bodies. Basaltic andesite necks and lava flows have fine-grained and porphyritic textures with labradorite plagioclase, clinopyroxene and olivine in a glassy groundmass. Pyroclastic rocks are abundant at Pumillahue bay and are mainly represented by white, glassy, lithic-rich rhyodacitic pyroclastic flows with fresh plagioclase, oriented fragments of both white and compacted black pumice, partially altered volcanic lithics, rounded clastic sedimentary fragments and carbonized wood, within a recrystallized perlitic, silicic glass.

The secondary alteration assemblage (mainly calcite, silica, chlorite and/or zeolites with silica, calcite and zeolites filling amygdalae, veins and/or as disseminations) is well represented in all the volcanic complexes along the present day coastline and has been suggested to represent magma-seawater interaction during eruptions (Muñoz *et al.* 2000)



Reference  
 Moreno, T. & Gibbons, W. (eds) 2007. *The Geology of Chile*. The Geological Society, London.  
 Miguel A. Parada (coordinator), Leopoldo López-Escobar, Verónica Oliveros, Francisco Fuentes, Diego Morata, Mauricio Calderón, Luis Aguirre, Gilbert Féraud, Felipe Espinoza, Hugo Moreno, Oscar Figueroa, Jorge Muñoz Bravo, Rosa Troncoso Vásquez & Charles R. Stern Andean magmatism In: Moreno, T. & Gibbons, W. (eds) *The Geology of Chile*. The Geological Society, London, 115 - 146