STRUCTURAL GEOLOGY OF THE SIERRA CASTILLO - AGUA AMARGA FAULT SYSTEM, PRECORDILLERA OF CHILE, EL SALVADOR-POTRERILLOS

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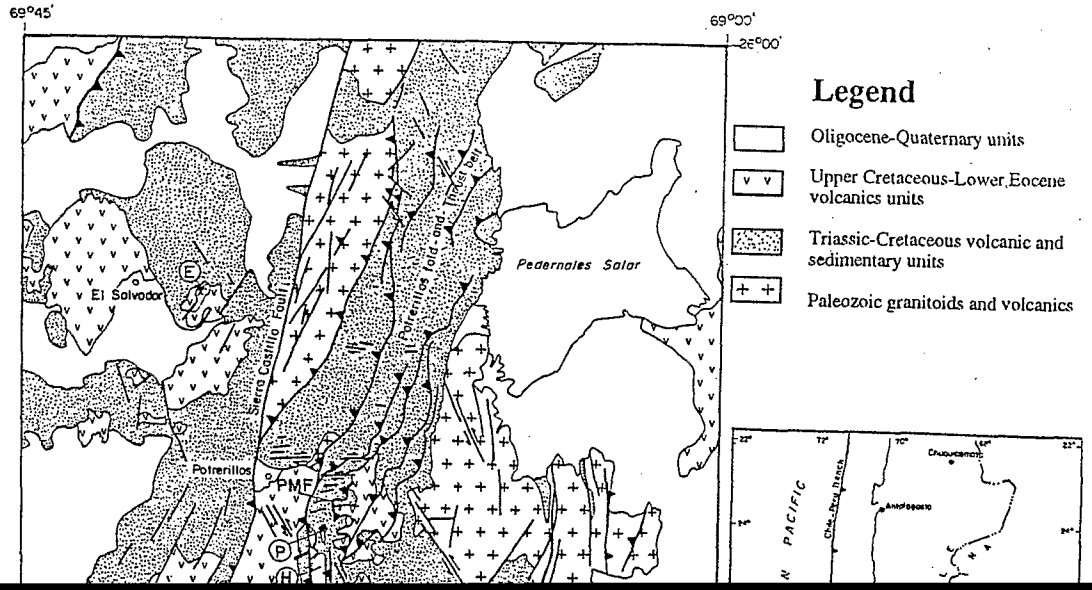
RESUMEN: El sistema de la falla Sierra Castillo - Agua Amarga es parte de un sistema de fallas activas a lo largo del eje del arco magmático Eoceno-Oligoceno inferior, asociado al emplazamiento de pórfidos cupríferos del norte de Chile. Las estructuras y relaciones de edad en las zonas adyacentes al sistema de la falla

fault in the area separating a Mesozoic platform sequence on the east from a coeval volcanic sequence on the west.

The timing of movement of the Sierra Castillo and Agua Amarga faults are poorly constrained. The Sierra Castillo fault cuts rocks as young as Cretaceous and is overlain by the Miocene Atacama Gravels. However, several faults subparallel to and apparently linked to the Sierra Castillo fault, cut intrusive rocks as young as 40-38 Ma (K-Ar whole rock and biotite ages). Similarly, the Aqua Amarga fault cuts Middle Eocene intrusive rocks (46.6 ± 1.5 and 44.2 ± 1.2 Ma) and is overlain by the Miocene Atacama Gravels.

POTRERILLOS FOLD-AND-THRUST BELT

The Potrerillos fold-and-thrust belt is an approximately 14 km wide and 45 km long (minimum) east-vergent belt (Figure 1) exhibiting two different styles of deformation in its eastern and western parts. The eastern part exhibits thin-skin, ramp-flat style folding and thrusting, and deforms primarily a Mesozoic


69°45'
69°00'
25°00'
Legend
Oligocene-Quaternary units
Upper Cretaceous-Lower Eocene volcanics units
Triassic-Cretaceous volcanic and sedimentary units
Paleozoic granitoids and volcanics
El Salvador
Sierra Castillo Fault
Pedernales Salar
Potrerillos
PMF
PACIFIC

Eocene dikes (~39 Ma), whose mean trend (~N55°W) approximately bisects the dihedral angle between the two fault sets. Latite dikes in the El Salvador Mine (42.0 ± 1.0 Ma K-Ar biotite, recalculated from Gustafson and Hunt, 1975) have the same orientation and are interpreted to have intruded under the same regional stress state.

The asymmetric development and domainal distribution of the conjugate set is interpreted to indicate formation during a noncoaxial strain history (Choukroune et al., 1987; Gapais et al., 1991), as occurs in major strike-slip fault systems. In this regard, the NW-trending sinistral faults are interpreted to be Riedel-shears and the dextral faults conjugate Riedel-shears. The orientation of the shortening direction given by the