

MACRO-LINEAR ELEMENTS IN THE GREATER MONO BASIN, CALIFORNIA

R.J.P. Lyon and G.I. Ballew
Stanford University
Stanford, California

ABSTRACT

Previous tectonic analyses of the structures of the Mono Lake, California, region have centered on the relatively small areas surrounding the lake itself, or on that of the Long Valley caldera immediately to the south, near Bishop.

The regional overview afforded by ERTS, plus the temporal series of lowered sun illuminations and/or snowfalls have helped markedly in perceiving the broader, topographically depressed structure of what we will term the Greater Mono Basin. This major tectonic feature is bounded on three sides by megafractures which in turn form the eastern walls of the Sierra Nevada (NNW trend), the northern end of the Inyo Range (NE trend) and that of the Bridgeport valley-Hawthorn line (also NE trend). To the east, the edge of the Basin is diffuse, but it is undoubtedly bounded by the Walker Lane suture.

Supplementary evidence is afforded by infilling of Pliocene volcanics which are mostly restricted within these fracture bounds, the anomalously higher heat flows from surface waters in this basin, particularly along the NNW trend of the Long Valley-Paoha Island (Mono Lake) axis, and that the indicated source for the boron, now in Owens and Searles Lakes, is from ancestral drainage originating in this basin.

Taking all these facts together, then, the Greater Mono Lake Basin appears to be a major graben-like structure, bounded on three sides by megafractures, which has localized Tertiary volcanism and has a continuing high heat flow as expressed by geothermal anomalies. The mining areas of Bodie and Aurora appear localized in another NE trending zone within this graben as vein structures in the Tertiary volcanic piles.