Merguerian, Charles, 1986b, Geology of the Sonora dike swarm, Sierra Nevada foothills, California.

The Sonora dike swarm, an areally extensive (>1500 km^2) consanguineous suite of dikes of pargasitic amphibole-, plagioclase-, and augite-phyric andesite, lamprophyre, and basalt intrudes the foothills metamorphic belt of the central Sierra Nevada near lat. 38° N in California. The swarm is subvertical and trends east-west across two polyphase deformed Paleozoic to Mesozoic tectonostratigraphic units. These units, the Shoo Fly and Calaveras Complexes, also form the basement to a middle Jurassic calc-alkaline continental arc that is partly obscured on the east by younger granitoids of the Sierra Nevada batholith. Geochronologic data of Sharp (1980) indicates that the dikes are also middle Jurassic (157-159 Ma), which suggests that they may be petrogenetically related to the arc sequence. Field, petrographic, and geochemical studies indicate that the Sonora dikes are derived from calc-alkaline magmas that probably formed during subduction of oceanic crust beneath the continental arc.

The dikes provide an important structural marker in the Shoo Fly and Calaveras Complexes. The dikes truncate and intrude along an east- west-trending spaced schistosity in the metamorphic belt that formed parallel to the axial surfaces of folds of the Calveras-Shoo Fly thrust. Clearly, the juxtaposition of the Shoo Fly and Calaveras Complexes and the east-west folds are pre-middle Jurassic events. Dilation of the east-west-trending metamorphic fabric in the marginal arc basement preceded and probably was coeval with intrusion of the dike swarm. Such north-south extension was probably enhanced by the nearly orthogonal relationship between the trend of the arc (NNW-SSE) and the east-west-trending spaced schistosity of the Shoo Fly and Calaveras.