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Title: PREDICTIVE MODEL: UPPER CRETACEOUS TO EARLY MIOCENE PALEOGEOGRAPHY OF THE SAN ANDREAS FAULT SYSTEM DERIVED FROM DETAILED MULTIDISCIPLINARY CONGLOMERATE CORRELATIONS

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Abstract: Paleogeographic reconstruction of the San Andreas fault system in western California, USA, was hampered for more than twenty years by the apparent incompatibility of authoritative lithologic correlations. These led to disparate estimates of dextral strike-slip offsets across the San Andreas fault, notably 315 km between Pinnacles and Neenach Volcanics (Matthews, 1976), versus 563 km between Anchor Bay and Eagle Rest Peak (Ross et al., 1973). In addition, estimates of total dextral slip on the San Gregorio fault have ranged from 5 km to 185 km.

Sixteen upper Cretaceous and Paleogene conglomerates of the California Coast Ranges, from Anchor Bay to Simi Valley, have been included in a multidisciplinary study. Detailed analysis, including microscopic petrography and microprobe geochemistry, verified Seiders and Cox's (1992) and Wentworth's (1996) correlation of the upper Cretaceous Strata of Anchor Bay at Anchor Bay with an unnamed conglomerate east of Half Moon Bay. Similar detailed study, with the addition of SHRIMP U/Pb zircon dating, verified that the Paleocene or Eocene Point Reyes Conglomerate at Point Reyes is a tectonically displaced segment of the Carmelo Formation of Point Lobos (near Monterey).

These studies were centered on identification of matching unique clast varieties, rather than on simply counting general clast types, and included analyses of matrices, paleocurrents, diagenesis, fossils, adjacent rocks, and stratigraphy. The work also led to three new correlations: the Point Reyes Conglomerate with granitic source rock at Point Lobos; a magnetic anomaly at Black Point (near Sea Ranch) with a magnetic anomaly near San Gregorio; and the Strata of Anchor Bay with previously established source rock, the potassium-poor Logan Gabbro (Ross et al., 1973), at a more recently recognized location (Brabb and Hanna, 1981; McLaughlin et al., 1996) just east of the San Gregorio fault, south of San Gregorio.

From these correlations, an upper Cretaceous - early Oligocene paleogeography of the San Andreas fault system was constructed that honored both the Anchor Bay/Eagle Rest

Peak correlation of Ross et al. (1973), and Matthews's (1976) correlation of Pinnacles-Neenach Volcanics. This paleogeography originally encompassed more than 30 documented pairs of correlative geologic and geophysical features at more than 20 pairs of localities, and has proved to be predictive. Since its first introduction, in April and June 1998, other authors have reported seven newly identified correlative pairs of geological and geophysical features that are consistent with this model. The new correlations required expansion of this paleogeography in both time and space: The paleogeography now incorporates at least 45 pairs of documented correlatives, covers the period from 70 Ma to 23.5 Ma, and extends from Pelona and Orocopia to the northernmost end of the San Andreas fault system at the modern position of the Mendocino triple junction.