TECNOOSTRATIGRAPHIC TERRANES IN SOUTHWESTERN OREGON

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ABSTRACT

Recent geologic and paleomagnetic studies suggest that southwest Oregon consists of a collage of small, fault-bounded, upper Mesozoic tectonostratigraphic terranes. These terranes and their probable paleotectonic environments are the Gold Beach (oceanic island arc), Yolla Bolly (transitional from continental arc-continental margin?), Snow Camp (island arc?), Sixes River (transform melange), Picket Peak (subduction or collision complex), and Western Klamath (island arc and marginal basin). The terranes are of Late Jurassic to Early Cretaceous age. The Western Klamath terrane had probably accreted in its present position by Early Cretaceous time, most of the other terranes prior to middle Eocene time, and the Gold Beach terrane may have accreted in post-middle Eocene time.

INTRODUCTION

Geologic and geophysical data summarized herein coupled with numerous regional and local studies by other workers (including Dott, 1971; Coleman, 1972; Ramp, 1975, Ramp and others, 1977; Roure, 1981; Roure and Blanchoet, 1983; Smith and others, 1982; Garcia, 1982) have been used to distinguish six tectonostratigraphic terranes in the upper Mesozoic rocks of southwestern Oregon based on the internal stratigraphic criteria defined by Coney, Jones and others, 1984) consists of sedimentary and igneous rocks of the Upper Jurassic and Lower Cretaceous Dothan Formation. These rocks were subdivided by Widmier (1962) into a volcanic-rich coastal member and a sandstone-rich inland member. Subtle differences in sandstone petrology, geochemistry, and textural grade permit subdivision of these rocks into eastern and western subterraneas with proximity to an arc on the west and a continental margin on the east. Megafossils and radiolarian faunas found in both subterraneas range in age from Tithonian to Hauterivian.

Sandstone of Dott (1971), and Hunters Cove Formation of Dott (1971). Fossils of Aptian to Albian age (W. R. Evitt, oral commun., 1980), probably from the Houstaden Creek unit, were collected by Francois Roure from a tectonic zone between the Otter Point Formation and the Hunters Cove Formation and may narrow the age of the unconformity to Lower Cretaceous.

The Otter Point Formation consists mostly of interbedded volcanic sandstone, mudstone, and conglomerate, but also contains andesite breccia and tuff. These rocks appear to have formed in deep-marine environments adjacent to a Late Jurassic (Tithonian) island arc (Aalto and Dott, 1970; Dott, 1971; Coleman, 1972; Walker, 1977). The structure of the Otter Point ranges from little-deformed sedimentary rocks to intensely sheared broken formation or melange which contains blocks of pillow basalt, radiolarian chert, and serpentinite. The stratigraphic position of these rocks is not known. Metamorphism of the Otter Point sedimentary rocks is limited to abundant veins of laumontite. Prehnite, pumpellyite, and epidote that formed during ocean-floor metamorphism are present locally in the pillow lavas.

The overlying Cretaceous rocks were deposited in shallow-marine (Houstaden Creek unit of Bourgeois, 1980, and Cape Sebastian Sandstone of Dott, 1971) and deep-marine environments (Hunters Cove Formation of Dott, 1971). These rocks are predominantly quartzofeldspathic in composition, apparently incompatible with a Klamath Mountains source terrane (Bourgeois, 1980). Although the depositional contact between Cretaceous rocks and the Otter Point is well-exposed locally, in most places it is obscured by younger thrust faulting and folding (Dott, 1971).

Yolla Bolly Terrane

The Yolla Bolly terrane in Oregon (Silberling and others, 1984) consists of sedimentary and igneous rocks of the Upper Jurassic and Lower Cretaceous Dothan Formation. These rocks were subdivided by Widmier (1962) into a volcanic-rich coastal member and a sandstone-rich inland member. Subtle differences in sandstone petrology, geochemistry, and textural grade permit subdivision of these rocks into eastern and western subterraneas with proximity to an arc on the west and a continental margin on the east. Megafossils and radiolarian faunas found in both subterraneas range in age from Tithonian to Hauterivian.

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