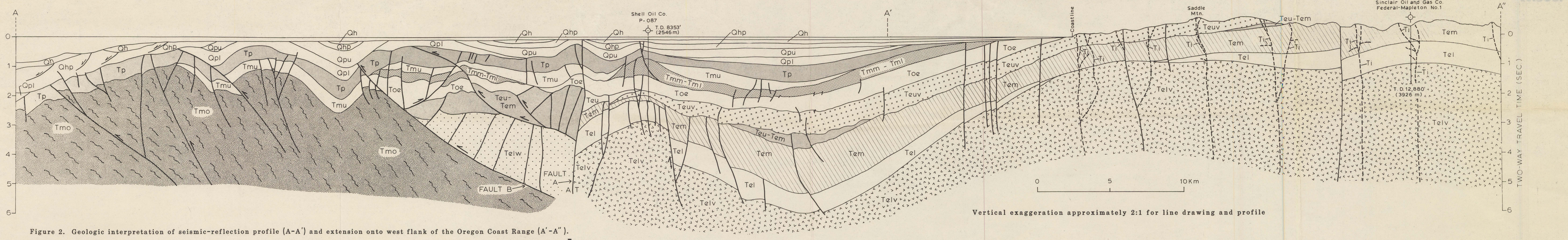


Figure 2. Geologic interpretation of seismic-reflection profile (A-A') and extension onto west flank of the Oregon Coast Range (A'-A").

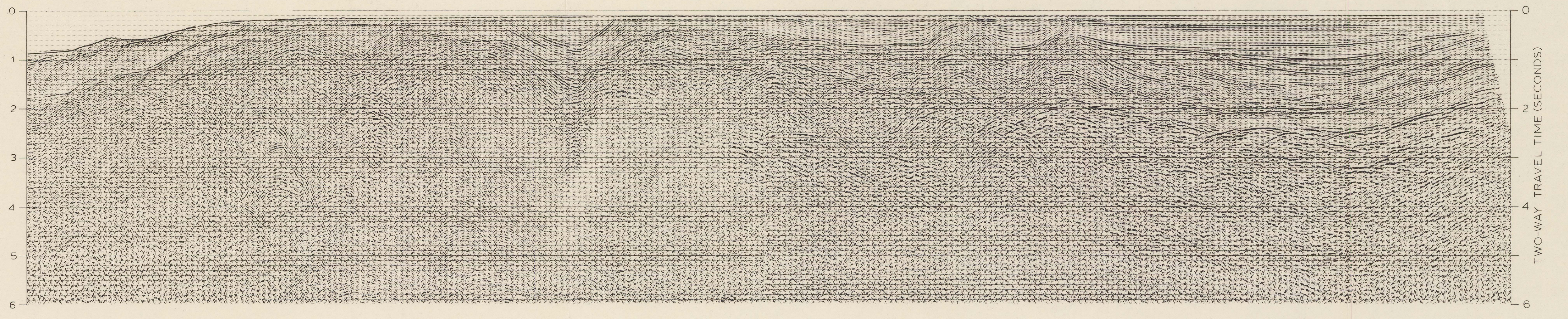


Figure 3. 24-channel seismic-reflection profile A-A'.

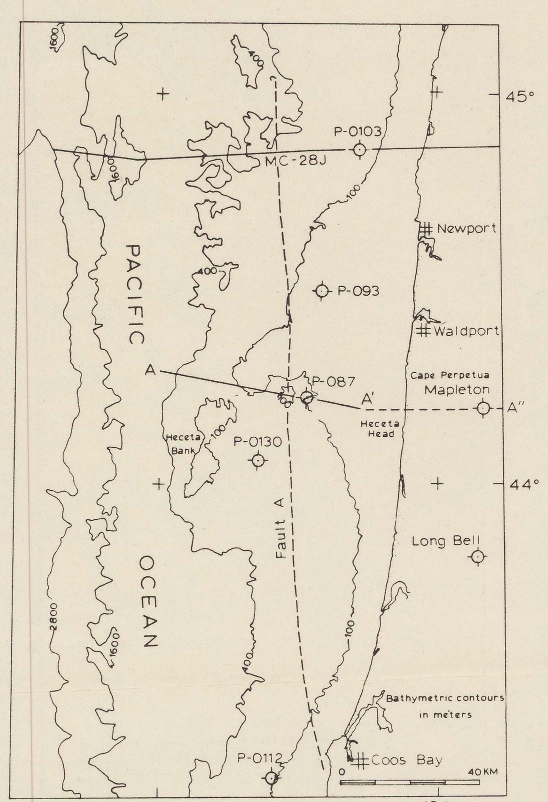


Figure 1.--Index map of the southern Oregon continental margin showing locations of cross section A-A" and of the Geological Society of America cross section MC-28J (Snavely and others, 1980).

OFFSHORE TIME-STRATIGRAPHIC UNITS			ONSHORE FORMATIONAL UNITS
Qh	Holocene		Beach and river deposits
Qhp	Pleistocene		Coastal terraces
Qpu			
Qpl			
Tp	Pliocene		unnamed siltstone
Tmu	Miocene	late	Empire Fm
Tmm-Tml		middle	Astoria Fm
		early	Nye Mudstone
Toe	Oligocene		Alsea Fm
Teu	Eocene	late	Nestucca Fm / Yachats Basalt
Teu-Tem		middle	Yamhill Fm
Tem			Tyee Fm
Tel		early	sltst mem. Umpqua Fm / Siletz
Telw / Telv*			River Volcanics

* Equivalents of Telw not recognized onshore

Figure 4.--Chart showing inferred correlation of offshore time-stratigraphic units and onshore formations.

GEOLOGIC CROSS SECTION OF THE SOUTHERN OREGON COAST RANGE AND ADJACENT CONTINENTAL SHELF

By Parke D. Snavely, Jr., Holly C. Wagner, Weldon W. Rau, and David Bukry

Introduction

In order to understand more fully the tectonic and stratigraphic framework of the Oregon and Washington continental margin, a series of land-sea cross sections are being prepared. These sections are based upon onshore geologic mapping, the interpretation of 24-channel seismic-reflection profiles, and the correlation of acoustical units with the subsurface stratigraphy encountered in deep exploratory test wells drilled offshore by industry in the mid-1960's (Braislin and others, 1971; Snavely and others, 1977). The first published cross section in the series for the Oregon continental margin using this kind of information (see fig. 1, line MC 28J) was prepared for the U.S. Geodynamics Committee and published by the Geological Society of America in their Map and Chart Series (Snavely and others, 1980).

The geologic cross section A-A" (fig. 2), described in this report, extends generally westward from the Oregon Coast Range to the edge of the continental shelf at latitude 44°12'N (fig. 1). The geology used to construct the onshore portion of this cross section is based upon onshore geologic mapping by Baldwin (1956), unpublished mapping by Snavely in the Heceta Head and Mapleton quadrangles, and on subsurface data in Sinclair Oil and Gas Company's Federal-Mapleton No. 1 well (fig. 6). The interpretation of the offshore geology is based mainly upon a 24-channel seismic-reflection profile (fig. 3) collected aboard the U.S. Geological Survey's Research Vessel S. P. LEE and subsurface stratigraphic data in Shell Oil Company's offshore P-087 well (fig. 5). We express our appreciation to Shell Oil Company for permission to publish the results of our paleontological and petrographic studies of samples made available by Shell from their well. Other data collected along the profile include deep-penetration single-channel and high-resolution seismic-reflection profiles and magnetic and gravity data. The geologic interpretation, where extrapolated westward from the shoreline to the eastern end of seismic profile A-A', is simplified as it is based on a shallow-penetration single-channel seismic reflection profile collected by Oregon State University (Kulm and Fowler, 1970).

Three cross sections for the southern Oregon continental margin immediately south of geologic cross section A-A" have already been published (fig. 1). They are based upon geophysical data and subsurface information in Union Oil Company Fulmar P-0130 well and Sinclair Federal-Mapleton No. 1 well (fig. 1). Braislin and others (1971) constructed a diagrammatic regional cross section from Heceta Bank eastward to the Cascade Range which showed the generalized Tertiary structure and stratigraphy. Seely and others (1974) presented an interpretation of a 12-channel seismic-reflection profile that extended from the abyssal plain to a point on the continental shelf about midway between Union P-0130 well and the coastline. In their report they propose that imbricate thrusting accounts for the structural thickening and uplift of sediments on the continental slope of this and other convergent continental margins. The tectonic framework of the Oregon and Washington outer continental margin and slope, as interpreted from our 24-channel seismic profiles (e.g. Snavely and others, 1980), agrees in most respects with the compressional thrusting and folding model proposed by Seely and others (1974). Couch and Braman (1980) presented a regional crustal section from the abyssal plain eastward across Heceta Bank to the Willamette Valley.

Stratigraphy

the Oregon Coast Range and on the inner continental shelf, are assigned to the lower and middle Eocene Siletz River Volcanics (Snavely and Baldwin, 1948; Snavely and others, 1968). Tholeiitic pillow lavas of early Eocene age in the lower part of this sequence are considered to be oceanic-ridge basalts which locally are overlain by alkalic and tholeiitic basalt flows with interbedded basaltic sandstone and siltstone that formed oceanic islands or seamounts of middle Eocene age (Snavely and others, 1968, 1980). The Mapleton well in the eastern part of the cross section (figs. 2, 6) penetrated about 2000 m of dark-gray porphyritic and amygdaloidal olivine- and augite-bearing pillow basalt of the Siletz River Volcanics of early Eocene age (unit Telv). The basalt is veined by calcite, celadonite, and zeolite minerals. These lavas are inferred to extend westward beneath the inner continental shelf to a point just west of Shell P-087 well (fig. 2) where they presumably terminate against transform fault A (figs. 1, 2). The fault contact between these basalts (unit Telv) and a thick sequence of lower Eocene wackes (unit Telw) to the west occurs along a linear magnetic anomaly with a west facing steep gradient as shown on an aeromagnetic map published by the U.S. Geological Survey (1970). This contact has been interpreted as a transform fault between the Pacific (Farallon) and American plates (Snavely and others, 1980).

The lower Eocene wackes (unit Telw) west of transform fault A (figs. 1,2) were penetrated in both Union P-0130 well and Pan American Oil Company (now AMOCO Production Corporation) P-0112 well south of the cross section (fig. 1). In well P-0130 the strata consist of 2000 m of sheared dense zeolitized, micaceous, arkosic wacke with interbedded siltstone of early Eocene age. More than 900 m of these wackes were encountered in well P-0112. The lower Eocene wacke is interpreted as not extending west of thrust fault B, as it is presumed to have been subducted along this fault during a period of plate convergence in middle late Eocene time (Snavely and others, 1980). The near vertical faults that cut the wacke sequence west of Fault A and those that cut the lower and middle Eocene rocks east of fault A probably are multiple breaks within the broad zone dextral movement along transform fault A.

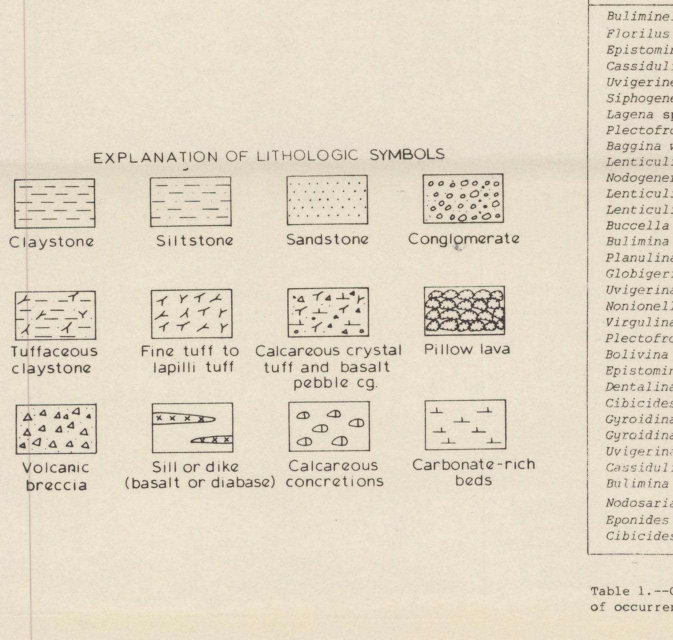
A sequence of well-indurated dark-gray finely micaceous siltstone 1280 m thick with minor basaltic sandstone and tuff interbeds (unit Tel) overlies the Siletz River Volcanics in the Mapleton well (fig. 6). The siltstone is commonly veined with calcite and intruded by basalt and diabase(?) dikes or sills. A 200 m basal member of the siltstone sequence was described in the well as a "microconglomerate;" however, based upon the company's description of sidewall cores, we interpret this member as a water-laid vitric and crystal tuff which contains subhedral crystals of augite, feldspar, calcite, and basalt grains set in a calcareous matrix.

The "microconglomerate" member in the Mapleton well probably correlates with the Wilbur tuff lentils mapped by Diller (1898) in the Roseburg area and with a tuff member of the Umpqua Formation described by Hoover (1963) in the Anlauf-Drain area. This water-laid calcareous fine to lapilli vitric and crystal tuff, with an admixture of basaltic sandstone and pebble conglomerate, may represent material eroded from volcanic islands. It was probably deposited along the unconformable contact between the lower Eocene Siletz River Volcanics and an overlying lower to middle Eocene siltstone sequence. Foraminifers in Wilbur tuff equivalents in the Anlauf-Drain area are assigned to the Penutian Stage and coccoliths to the Discoaster lodoensis Zone both of early Eocene age.

Although foraminiferal data were not available from the Mapleton well, a stratigraphic correlation can be made with units dated by Rau (1973a) in the Mobil Oil Company Long Bell No. 1 well drilled about 42 km south of the Mapleton well (fig. 1). This correlation indicates that the siltstone sequence (unit Tel) in the Mapleton well probably ranges in age from the early Eocene Penutian Stage in the lower part to the middle Eocene part of the Ulatisian Stage in the upper part. A siltstone sample from a depth of 1460 m in the Mapleton well contained a coccolith fauna indicative of the Tribrachiatus orthostylus Zone or Discoaster lodoensis Zone of coccoliths (Bukry, 1973, 1975; Okada and Bukry, 1980) of early or late early Eocene age. The lower to middle Eocene siltstone in the Mapleton well (unit Tel) correlates with the siltstone member of the Umpqua Formation mapped by Hoover (1963) in the Anlauf and Drain quadrangles on the east flank of the southern part of the Coast Range.

References

EXPLANATION OF LITHOLOGIC SYMBOLS



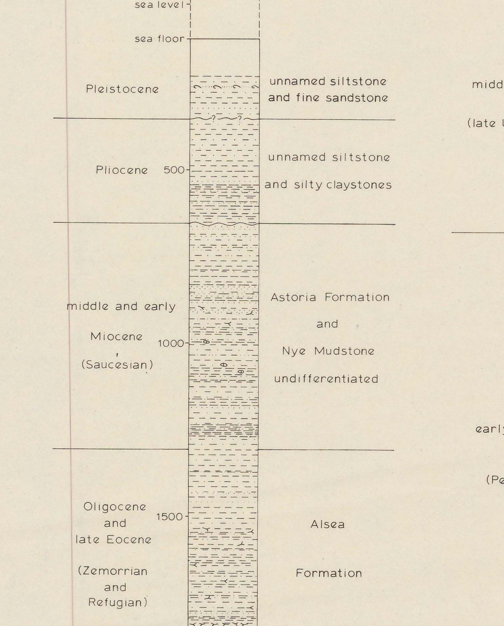


Figure 5.--Lithologic log of Shell Oil Company P-087 well showing ages of units penetrated and inferred correlation of onland formations. Depth in meters measured from kelly bushing 21 m above sea level.

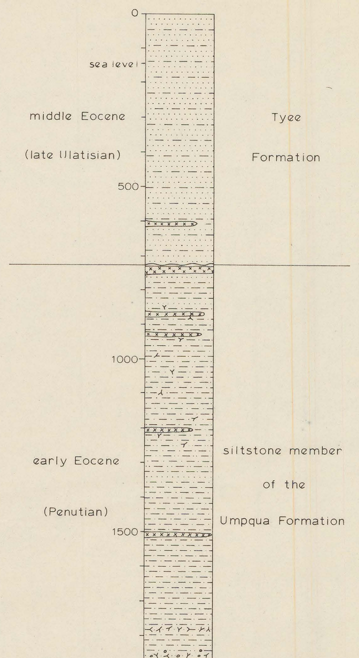


Figure 6.--Lithologic log of Sinclair Oil and Gas Company Federal-Mapleton No. 1 well showing ages of formations penetrated. Depth in meters measured from ground surface 147 m above sea level.

Table 1.--Checklist of Foraminifera in Shell Oil Company P-087. Identifications by W. W. Rau.

Table 2.--Checklist of Phytoplankton in Shell Oil Company P-087. Identifications by David Bukry.

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1981

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.