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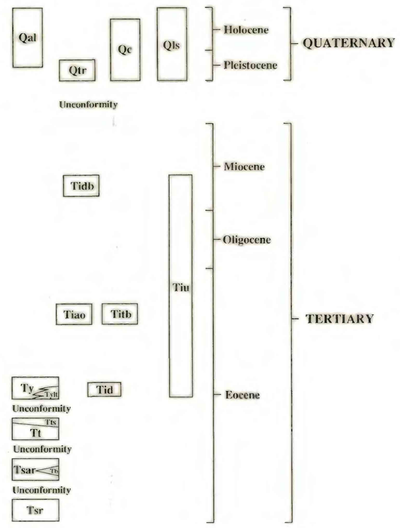
CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qal **Alluvial deposits (Holocene and Pleistocene)**—Silt, sand, and gravel along rivers and streams; locally, as along the Salmon River, includes low-lying (1 to 2 m) river terrace gravels and thick colluvium; includes lacustrine deposits in headwaters of the Little Nestucca River which may be the result of landslide impoundment; in places Tertiary bedrock exposed in river beds

Qls **Landslide debris (Holocene and Pleistocene)**—Mapped where deposits are readily apparent or inferred from topographic expression on maps or aerial photographs; small soil or rock failures not mapped; landslides are pervasive, but most common in areas underlain by siltstone of the Yamhill Formation and marginal to areas capped by diabase sills in the southeastern part of the quadrangle; many landslides are old, eroded, and overlain by alluvium in valley bottoms

Qc **Colluvial deposits (Holocene and Pleistocene)**—Poorly sorted angular to round debris mostly of diabase that form broad aprons or filled-channel deposits along the north side of Saddle Bag Mountain; commonly 2 to 10 m thick; mapped only where deposits obscure bedrock over large areas; deposits modified in places by terraces along the Salmon River

Qtr **River terrace deposits (Pleistocene)**—Sand, cobble, and boulder gravels; terrace deposits most common along Salmon River where in places they are as high as 190 m above river level; terraces most likely are a result of regional uplift; landslide or colluvial deposits commonly mask terraces

Ty **Yamhill Formation (middle Eocene)**—Massive to thin-bedded concretionary finely micaceous siltstone with filled-channel deposits of massive to cross-bedded sandstone; graded thick- to medium-bedded micaceous arkosic and lithic sandstone and carbonate-rich punky weathering sandstone occur chiefly in the lower part of the sequence; light-gray fine tuff beds as much as 1/2 m thick and indurated flaggy siltstone occur locally; north of the map area in the Hebo quadrangle, the Yamhill Formation intertongues with lapilli tuff, breccia, and pillow lava of the Tillamook Volcanics; a major regional unconformity is present at the base of the Yamhill Formation and in places unit onlaps the lower Eocene Siletz River Volcanics; foraminiferal assemblages assigned to the upper Ulatisian and lower to middle Narizian Stages by W.W. Rau (written commun., 1986); coccolith flora assigned to the middle Eocene Subzones CP13c and CP14a (Bukry and Snavely, 1988); a diabase sill that intrudes the Yamhill Formation in the adjacent Hebo Quadrangle has a K/Ar age of 43.2 ± 1.8 Ma (LedaBeth Pickthorn, written commun., 1987)

Tyl **Lapilli-tuff (middle Eocene)**—Spheroidal-weathering massive to thick-bedded, zeolite- and calcite-cemented lapilli-tuff with minor interbeds of tuffaceous siltstone, and light-gray fine- to medium-grained tuff of the Yamhill Formation; irregular intrusive bodies of lapilli-tuff with blocks of baked siltstone occur north of the Little Nestucca River; some lapilli-tuff interbedded with the Yamhill siltstone may have been eroded off lenticular-shaped extrusive highs; a 30-m-thick light-gray fine- to medium-grained silicic tuff bed, which contains accretionary lapilli(?) and a few thin-shelled mollusks, is present near the base of the lapilli-tuff unit

Tt **Tyee Formation (middle Eocene)**—Medium- and fine-grained micaceous, feldspathic, lithic, or arkosic sandstone and micaceous carbonaceous siltstone in graded beds 1/2 to 3 m thick of turbidite origin (Snavely and others, 1964); groove and flute casts common on the soles of beds; a 2-m-thick thin-bedded siltstone and sandstone unit is present at the base of the Tyee Formation along the Salmon River where it unconformably overlies the Siletz River Volcanics. The siltstone is overlain by 30-cm-thick Tyee turbidites with calcareous concretions 25 cm in diameter; deposition of Tyee turbidites was restricted to the east side of volcanic highs formed by the lower Eocene Siletz River Volcanics as correlative strata on the west side are the basaltic sandstone of Otis Junction (Bukry and Snavely, 1988; Snavely and others, 1990a). Foraminifers from hemipelagic claystone laminae along the top of some turbidite beds are referred to the Ulatisian Stage by W.W. Rau, written commun., 1976). Coccoliths from these claystone laminae in the Euchre Mountain quadrangle immediately south of the map area and from a 50-m-thick siltstone unit (Tts) that overlies the Tyee turbidites in the north-central part of the Dolph quadrangle are assigned to Subzone CP12b of early middle Eocene age (Bukry and Snavely, 1988; Bukry, written commun., 1989)

Tts **Siltstone member (middle Eocene)**—Thin- to medium-bedded fissile siltstone with minor 1 m interbeds of spheroidal-weathering gritty lithic sandstone cemented with calcite in the upper part of the Tyee Formation, mostly in the northern part of the quadrangle. Coccoliths assigned to Subzone CP12b of early middle Eocene age by D. Bukry (written commun., 1989)

Tsar **Salmon River Formation (lower Eocene)**—Thick- to medium-bedded, coarse- to fine-grained basaltic sandstone and siltstone with calcareous ledges and concretions; thin- to medium-bedded siltstone and calcareous sandstone and platy siltstone with shell hash occur locally; contains minor interbeds of basalt cobble and pebble conglomerate; in the southwestern part of the quadrangle the unit contains thick interbeds of massive- to medium-bedded zeolitized lapilli-tuff and an amygdaloidal pillow basalt flow (Tb); pyrite-rich calcareous nodules occur in siltstone; near the lower contact with the Siletz River Volcanics the unit consists of massive to thick-bedded filled channel deposits of boulder and cobble conglomerate composed of well-rounded zeolitized basalt, pillow rinds, and diabase which are set in a matrix of gritty basaltic sandstone; irregular basalt dikes less than 1/2-m-thick that locally cut unit are feeder dikes to sparse flows in sequence; unit mostly represents basaltic debris eroded off Siletz River oceanic islands and deposited chiefly in a shallow-water environment (Snavely, 1991); coccoliths assigned to Subzone CP11 of early Eocene age (Bukry and Snavely, 1988)

Tsr **Siletz River Volcanics (lower Eocene)**—Pillow lava, flow breccia, tuff-breccia, and lapilli-tuff of tholeiitic and alkalic basalt with minor interbeds of marine basaltic sandstone, siltstone, and conglomerate; close-packed pillows range in diameter from 1/2 to 2 m (average 1 m), have radiating columnar joints, are pervasively zeolitized and veined with calcite and zeolite minerals, and are commonly amygdaloidal; basalt is aphanitic to porphyritic with phenocrysts of plagioclase and augite (Snavely and others, 1968); contains minor 1 to 2-m-thick beds of massive to graded and cross-bedded basaltic sandstone with siltstone rip-up clasts. Unit is entirely of submarine origin in quadrangle but locally includes subaerial flows in adjacent Euchre Mountain quadrangle and south (Snavely and others, 1976); foraminifera assigned by W.W. Rau (written commun., 1976) to the Penutian Stage; coccoliths from siltstone interbeds along the Little Nestucca River in the adjacent Nestucca Bay quadrangle are assigned to Zone CP10 of early Eocene age (Bukry and Snavely, 1988; Snavely and others, 1990b). These oceanic basalts, which in places formed islands and seamounts, are interpreted to have formed *in situ* during oblique rifting and extension of the continental margin (Snavely, 1984, 1987; Wells and others, 1984; Snavely and Wells, in press)

IGNEOUS ROCKS

Tidb **Depoe Bay Basalt (middle Miocene)**—Sill of platy columnar-jointed fine-grained equigranular basalt in northeast part of quadrangle; in the adjacent Hebo quadrangle, extensive thick sills cap Little Hebo, Mt. Hebo, and Mt. Gauldy; petrochemically identical to Grand Ronde Basalt of the Columbia River Basalt Group (Snavely and others, 1973)

Tiao **Augite-olivine-phyric basalt (upper Eocene)**—Sills 10 to 30 m thick, and less common dikes of dark gray, rusty brown weathering basalt characterized by abundant titaniferous augite phenocrysts (15 percent of the rock) and olivine phenocrysts (10 percent) up to 1 cm; sills are confined to narrow E-W belt across center of quadrangle where they intrude the Yamhill Formation; belt extends eastward from eruptive center at Cascade Head (Snavely and others, 1990a) where there are basalt flows and dikes with compositions similar to the sills; upper contacts of sills are not exposed so extrusive origin cannot be discounted but seems unlikely; may be invasive sills extending eastward from flows at Cascade Head

Titb **Basalt sill (upper Eocene)**—Basalt characterized by markedly trachytic fine-grained basalt composed of needle-shaped microlites of plagioclase in a groundmass augite, olivine, altered glass, and opaque minerals; sill intrudes Yamhill Formation; basalt with similar texture occurs as flows in the upper Eocene basalt of Cascade Head in the adjacent Neskowin quadrangle (Snavely and others, 1990a)

Tid **Diabase (middle Eocene)**—Sills and dikes of fine- to coarse-grained equigranular to porphyritic diabase and pegmetitic diabase; pervasively albitized and laumontized; intrudes strata as young as Yamhill Formation; extensive 250-m-thick sill(s) caps Saddle Bag Mountain in southeastern part of map area and in the adjacent Midway quadrangle to the east (MacLeod, 1969); a single K/Ar age on plagioclase in adjacent Hebo quadrangle is 43.2 ± 1.8 Ma (LedaBeth Pickthorn, written commun., 1987)

Tiu **Basaltic intrusive rocks, undivided (middle Miocene and Eocene)**—Sills and dikes of basalt, diabase, and fine-grained gabbro

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EXPLANATION OF MAP SYMBOLS

- Geologic contact - Approximately located or inferred. Contacts exposed only in a few places along riverbeds, or major logging roads; sill contacts are based mostly on topographic expression
- Fault - Approximately located or inferred; dashed where concealed; ball and bar on apparent downthrown side. Some exposed fault surfaces show horizontal slickensides indicating transcurrent movement. Faults are located on basis of a combination of shear zones, juxtaposition of strata with differing attitudes, anomalously steep attitudes, and topographic lineations
- Strike-slip fault - Arrows show relative horizontal movement

Folds - Inferred trace of axial plane and direction of plunge where known; dotted where concealed.

- Anticline
- Syncline

Minor folds or drag folds. Strike and dip shown on representative folds of a single fold axis; direction of plunge shown where known

- Anticline
- Syncline

Strike and dip of beds[1]

- 45 — Inclined--Direction and amount of dip shown where measured
- Horizontal
- 90 — Vertical, top of bed toward 90°
- Direction of mass transport in landslide deposits

Sedimentary features

- Groove casts on sole of turbidite sandstone showing orientation of current movement
- Flute cast on sole of turbidite sandstone showing direction of current movement

Tectonic or Igneous Features

- Sheared rocks
- Tiu — Small dikes or sills of basalt or diabase; generally 1-3 m thick; letter symbol indicates rock type listed in description of igneous map units

[1]Strike and dip symbols in areas shown as Quaternary deposits along streams are dipping Tertiary rocks in outcrops too small to map

PRELIMINARY GEOLOGIC MAP OF THE DOLPH QUADRANGLE, LINCOLN, TILLAMOOK, AND YAMHILL COUNTIES, OREGON

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1991