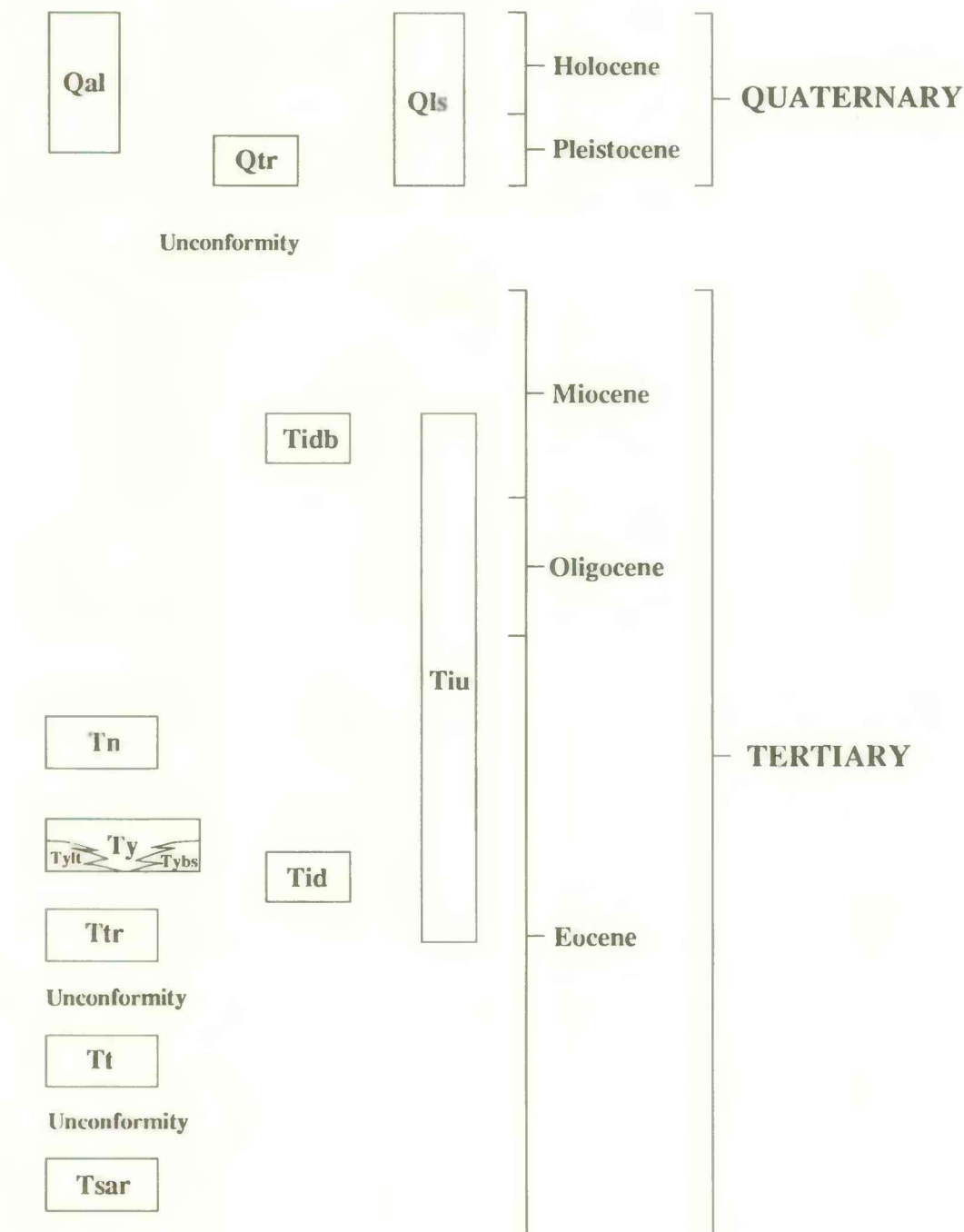


CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

- Qal** Alluvial deposits (Holocene and Pleistocene)—Silt, sand, and gravel along rivers and streams; includes low-lying river terrace gravels and thick colluvium; 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 middle Miocene basalt sills at Mt. Hebo and Mt. Gaudy; includes extensive colluvial deposits 2-10 m thick that form broad aprons or filled-channel deposits along the north side of Mt. Hebo.
- Qtr** River terrace deposits (Pleistocene)—Sand and cobble and boulder gravel; terrace deposits most common along the Nestucca and Three Rivers; low-lying terrace sediments are included in Qal; landslide or colluvial deposits commonly mask terrace material.
- Tn** Nestucca Formation (upper Eocene)—Medium- to thin-bedded tuffaceous siltstone with interbeds of fine-grained arkosic and basaltic sandstone; also contains thin tuff beds and calcareous concretions and interbeds of volcanic breccia and lapilli tuff; in the adjacent Nestucca Bay quadrangle (Snaveley and others, 1990) the Nestucca Formation contains foraminifers assigned to the upper Eocene Narizian Stage by W. W. Rau (written commun., 1979); coccoliths from outcrops along the east side of Nestucca Bay are assigned to late Eocene CP15a Subzone by David Bukry (written commun., 1988).
- Ty** Yamhill Formation (middle Eocene)—Massive to thin-bedded concretionary, finely micaceous siltstone with filled-channel deposits of massive to medium-bedded micaceous, arkosic and lithic sandstone and carbonate-rich punky-weathering sandstone occur chiefly in lower part of sequence; light-gray fine tuff beds as much as 1 m thick and well-indurated lignite sandstone and siltstone occur locally; contains interbeds of midflow breccia derived from the lapilli-tuff member; also contains tongues of lapilli tuff, breccia, and pillow lava derived from the eruptive center of Tillamook Volcanics immediately north in the Beaver quadrangle (Wells and others, in prep.).
- Tybs** Sandstone and tuff member (middle Eocene)—Thick to medium-bedded dark-gray basaltic siltstone and lapilli tuff with interbeds of well-indurated dark gray clay to massive basaltic siltstone with thin carbonaceous beds; amalgams forms cement in some beds; calcareous concretions are locally present as are penecontemporaneously deformed zones of basaltic siltstone; basaltic material derived from middle Eocene Tillamook Volcanics that crop out north of the Hebo quadrangle form local lenses; siltstone contains foraminifers assigned to a late middle or early late Eocene age by W. W. Rau (written commun., 1964); coccoliths are assigned to middle Eocene Subzone CP14a by D. Bukry (written commun., 1988).
- Tyit** Lapilli-tuff member (middle Eocene)—Spheroidally weathered massive to thick-bedded zoneite- and calcite-cemented lapilli tuff with minor interbeds of tuffaceous siltstone, and massive to poorly-bedded light-gray fine- to medium-grained tuff; in places blocks of siltstone as much as 1-1.5 m in diameter occur in dike-like bodies composed largely of lapilli tuff.
- Ttr** Basalt and sedimentary Rocks of Three Rivers (middle Eocene)—Generally poorly exposed pillow basalt and columnar-jointed basalt, lapilli tuff and breccia; minor poorly sorted basaltic sandstone and grit composed of broken grains of plagioclase feldspar and angular to subrounded fragments of basalt, basaltic andesite and felsite of the Tillamook Volcanics (with pillow-like flow texture composed of plagioclase and ilmenite microlites); massive to thick-bedded sandstones that are well-cemented by yellowish-brown clay minerals; most pillows are less than 1 m in diameter and very vesicular; interbedded well-indurated black, finely micaceous siltstone and white tuff beds are penecontemporaneously deformed along base of massive(?) flows and columnar-jointed filled lava tubes; abundant secondary minerals include pyrite, chalcopryite, calcite and zeolite minerals; flows appear to have intensely baked the adjacent sedimentary rocks; upper part of unit contains coccolith flora assigned to the CP13 Zone (Bukry, written commun., 1985); this sequence most likely correlates with basalt and sedimentary rocks assigned to the Basalt of Tenme Ridge (Wells and others, in prep.) in the Tillamook Highlands north of the map area and the lower part of the Yamhill Formation of adjacent area.
- Tt** Tyee Formation (middle Eocene)—Medium- and fine-grained micaceous, carbonaceous, arkosic, and lithic sandstone and thin- to medium-bedded micaceous siltstone in graded beds 1/2-2 m thick of turbidite origin; groove and flute casts are present on soles of some beds; contains interbeds of thin- to medium-bedded siltstone with 2-5 cm light-gray calcareous beds. Foraminifers in hemipelagic siltstone interbeds are referred to the Penutian or lower Ulatasian Stages by W. W. Rau (written commun., 1983). Coccolith flora from 4 m siltstone interbed 0.75 km south of junction of Three Rivers and Alder Creek are assigned to Subzone CP12b of early middle Eocene age by Bukry (written commun., 1983).
- Tsar** Salmon River Formation (lower Eocene)—Thick to medium-bedded, coarse- to fine-grained basaltic sandstone and siltstone with calcareous ledges and concretions; contains minor interbeds of basaltic cobble and pebbly conglomerate derived from underlying Siletz River oceanic islands (Snaveley, 1991); coccoliths assigned to Subzone CP11 of early Eocene age (Bukry and Snaveley, 1988); unit poorly exposed in headwater of Bear Creek in southwesternmost part of quadrangle.
- Tidb** Basalt (middle Miocene)—Sills of play columnar-jointed fine-grained equigranular basalt; extensive 20- to 150-m-thick sills cap Little Hebo, Mt. Hebo, and Mt. Gaudy; related to Depece Bay Basalt which crops out to southwest in the Cape Foulweather quadrangle (Snaveley and others, 1976); petrochemically identical to Grand Ronde Basalt of the Columbia River Basalt Group (Snaveley and others, 1973).
- Tid** Diabase (middle Eocene)—Sills and dikes of fine- to coarse-grained equigranular to porphyritic diabase; pervasively albited and ilmenitized; intrudes strata as young as Yamhill Formation; extensive 50- to 70-m-thick sill well exposed along Three Rivers; K/Ar age on plagioclase 43.2 ± 1.8 Ma (Leda Beth Pickhorn, written commun., 1987).
- Tiu** Basaltic intrusive rocks, undivided (middle Miocene and Eocene)—Sills and dikes of basalt, diabase, and fine-grained gabbro that intrude pre-late Eocene strata.

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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. Faults are located on basis of a combination of shear zones, juxtaposition of strata with differing attitudes and/or lithology, anomalously steep attitudes, and topographic lineations.
- Strike-slip fault - Arrows show relative horizontal movement.
- Thrust fault - Sawtooth on upper plate.
- Folds - Inferred trace of axial plane and direction of plunge where known; dotted where concealed.
- Anticline, arrow shows direction of plunge.
- Strike and dip of beds¹.
- Inclined - direction and amount of dip shown where measured.
- Horizontal.
- 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.
- Tectonic or Igneous Features.
- 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.

¹Strike 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 HEBO QUADRANGLE, TILLAMOOK AND YAMHILL COUNTIES, OREGON

By,

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1993