

EXPLANATION

alluvium (Holocene): Sand and gravel deposits along the flood plaim of the Cowlitz River and Winston Creek. Deposits are of unknown thickness and oxidation extends to a depth of less than 0.1 m.

landslide deposits (Holocene and Pleistocene): Locations modified after Roberts (1958).

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ho outwash (latest Pleistocene (?) and early Holocene):
Sand and gravel deposits of unknown thickness,
mantled with <0.3 m of fine sand and silt. Deposits
are oxidized to a depth of 0.5 m.

Evans Creek outwash, younger (latest Pleistocene):
Gravel deposits generally 3 to 6 m thick, mantled
with 0.3 to 2.0 m of fine sand and silt. Deposits
are oxidized to a depth of 1.0 m.

Evans Creek outwash, older (latest Pleistocene):
Gravel deposits generally 3 to 8 m thick, mantled with 0.5 to 1.5 m of silt and fine sand. Deposits are oxidized to a depth of 1.0 m.

pre-Evans Creek, post-Hayden Creek outwash (late Pleistocene): Gravel deposits generally 3 to 5 m thick, mantled with 0.5 to 1.5 m of silt and fine sand. Deposits form isolated terrace remmants near Toledo (dashed line separates two terraces). Oxidation extends to a depth of 1.0 to 1.5 m.

Hayden Creek outwash, younger (late (?) Pleistocene):
Gravel deposits generally 5 to 10 m thick, mantled
with 0.5 to 1.5 m of weathered silt. Deposits form
a prominent high terrace best exposed at Layton
Prairie on the south side of the Cowlitz River, and
are oxidized to a depth of 1.5 m.

Hayden Creek outwash, undifferentiated (late (?)
Pleistocene): Gravel deposits mantled with weathered
silt, forming isolated terrace remnants near Salkum,
and about 12 km northeast of Toledo. At the latter
locality, the deposit is composed of 16 m of gravel
mantled by 1.0 to 2.0 m of weathered silt. Oxidation
extends to a depth of 2.0 m.

fayden creek outwash, older (late (r) Pleistocene):

Gravel deposits generally 10 to 15 m thick, but as thick as 35 m in exposures near Salkum. Mantled with 1.0 to 1.5 m of weathered silt, and oxidized to a depth of 3.0 m.

Hayden Creek till (late (?) Pleistocene): Till covered with 1.5 to 3.0 m of weathered silt, thin sand and gravel deposits, and forming the surface deposit in the upland north and east of Silver Creek. The base of the till is not generally exposed, but at measured section 5 of Crandell and Miller (1974), about 3.6 m of till overlies Wingate Hill drift. Oxidation generally extends to a depth of 2.5 to 3.5 m.

Wingate Hill outwash (mid (?) Pleistocene): Gravel deposits more than 30 m thick near Salkum, and of unknown thickness elsewhere. Deposits are mantled with 1.0 to 3.0 m of weathered silt; oxidation commonly extends to depths of 5.0 to 10.0 m.

Wingate Hill till (mid (?) Pleistocene): Weathered till deposits mantled with 1.0 to 3.0 m of weathered silt, sand and gravel in the hills east of Salkum. Thickness is generally more than two meters, but deep exposures are infrequent. The valley between Salkum and Silver Creek is mapped as Wingate Hill till, but also exposes isolated outwash deposits of Hayden Creek (?) age, and probably served as a meltwater spillway during both glaciations. Till is oxidized to a depth of at least 5.0 m (Crandell and Miller,

Logan Hill Formation (early (?) Pleistocene): Deeply weathered outwash and till (?) deposits mantled with 2.0 to 4.0 m of silt and clay in many exposures. Exposed thickness west of Salkum is more than 40 m, but deposits south of the Cowlitz River (compiled from Roberts, 1958) are apparently thinner. Oxidation may extend to depths of more than 15.0 m, and the original texture of the upper 5.0 m of these deposits is often obscured by weathering.

bedrock, undifferentiated (Tertiary): Contacts modified from Roberts (1958), Weigle and Foxworthy (1962), and Crandell and Miller (1974). Bedrock is exposed beneath Evans Creek and Hayden Creek outwash deposits in near-vertical cuts along the Cowlitz River between Toledo and Mayfield Lake. In upland areas south of the Cowlitz River, bedrock is often mantled with thin Quaternary deposits.

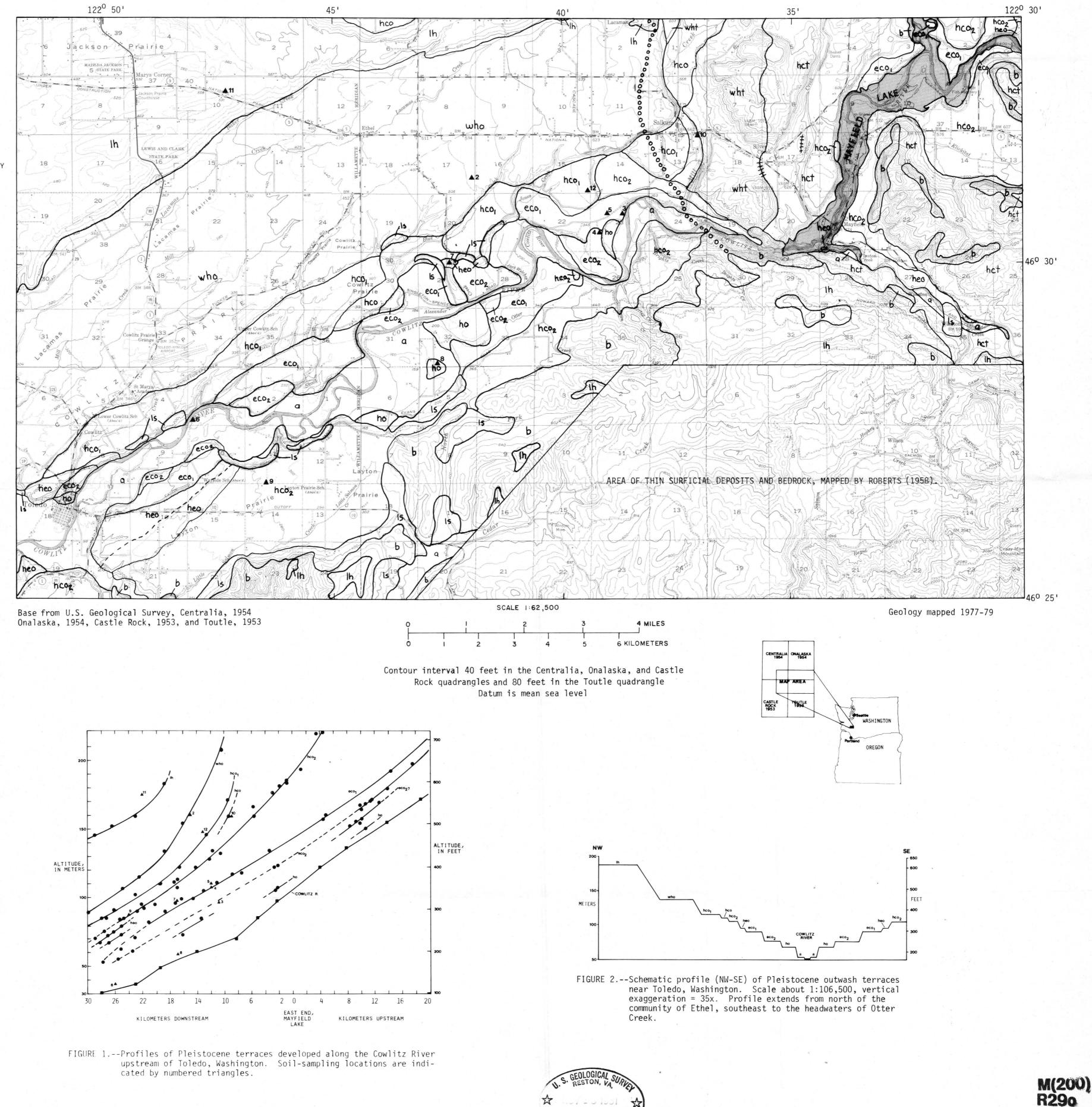
moraine of Hayden Creek age (modified from Crandell and Miller, 1974)

inferred maximum extent of Wingate Hill glacier (Crandell and Miller, 1974)

**Toponomous of the content of wingate Hill glacier (Crandell and Miller, 1974)

 $\underline{1}$ / Symbols are modified from Crandell and Miller (1974)

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



Surficial Deposits Along the Cowlitz River Near Toledo, Lewis County, Washington by

David P Dethier and John Rethel

David P. Dethier and John Bethel 1981