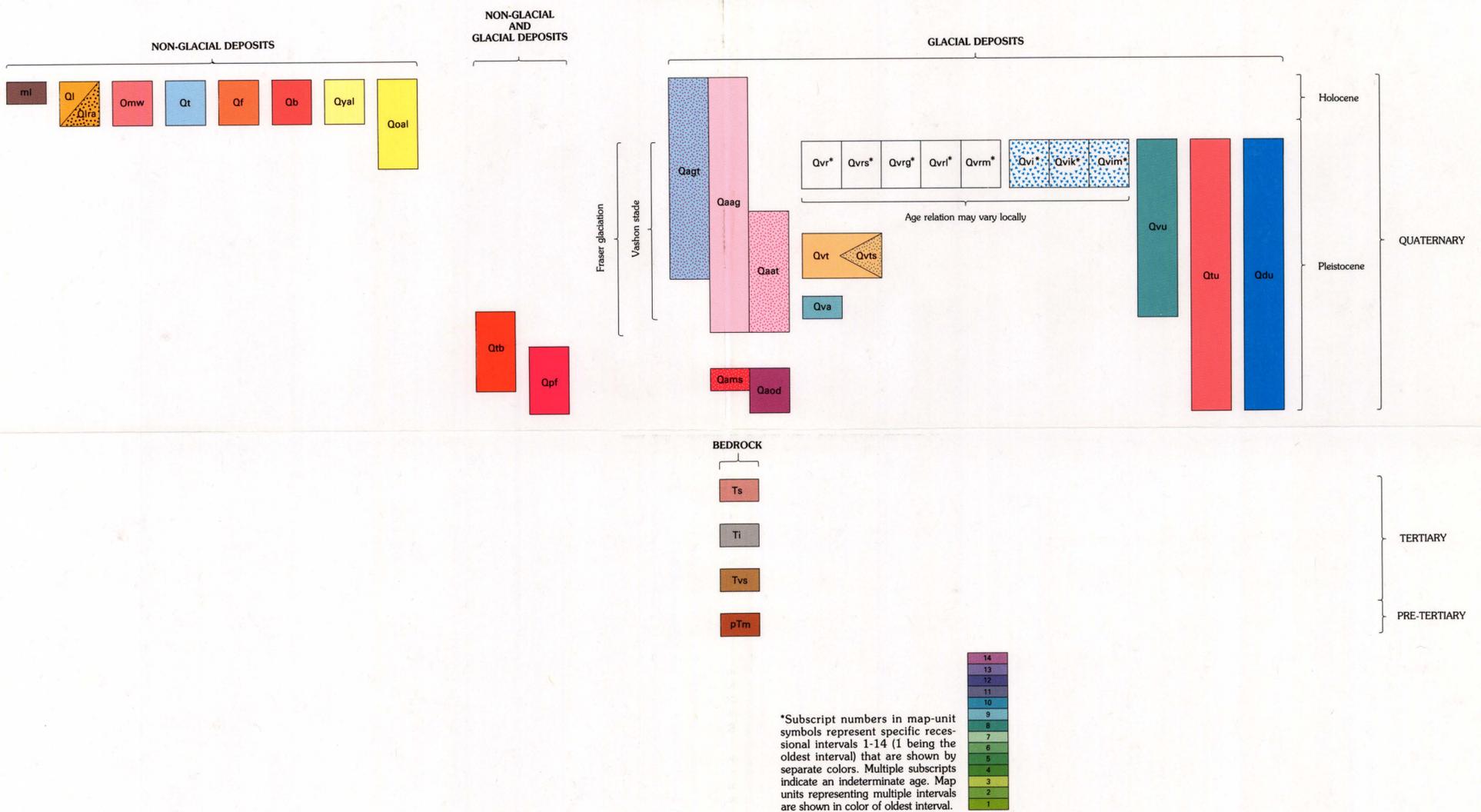


CORRELATION OF MAP UNITS



*Subscript numbers in map-unit symbols represent specific recessional intervals 1-14 (1 being the oldest interval) that are shown by separate colors. Multiple subscripts indicate an indeterminate age. Map units representing multiple intervals are shown in color of oldest interval.

DESCRIPTION OF MAP UNITS

NON-GLACIAL DEPOSITS

ml MODIFIED LAND (HOLOCENE) — Gravel or diamicton as fill or extensively graded natural deposits

LANDSLIDE DEPOSITS, UNDIVIDED (HOLOCENE) — Divided into:

Ql LANDSLIDE DEPOSITS — Diamicton of angular clasts of bedrock and surficial deposits derived from upslope locales. Many shown with no letter symbol, only arrows denoting downslope direction of movement

Qlra ROCK-AVALANCHE DEPOSITS — Huge angular boulders on or at the base of steep slopes

Qmw MASS-WASTAGE DEPOSITS (HOLOCENE) — Colluvium, soil, or landslide debris with indistinct morphology, mapped where sufficiently continuous and thick to obscure underlying material. Deposits are gradational with units Qf and Ql

Qt TALUS DEPOSITS (HOLOCENE) — Non-sorted angular boulder gravel to boulder diamicton. At lower altitudes gradational with unit Qf. At higher altitudes includes small rock-avalanche deposits as well as some Holocene moraines, rock glaciers, and protalus rampart deposits that lack characteristic morphology. Generally unvegetated surfaces

Qf ALLUVIAL FAN DEPOSITS (HOLOCENE) — Poorly sorted cobble to boulder gravel, deposited as either a discrete lobe at the intersection of a steep stream with a valley floor of lower gradient or as a broad apron of coalescing fluvial material on steep sideslopes

Qb BOG DEPOSITS (HOLOCENE) — Peat and alluvium. Poorly drained and at least intermittently wet annually. Grades into unit Qyal

Qyal YOUNGER ALLUVIUM (HOLOCENE) — Moderately sorted deposits of cobble gravel to pebbly sand along rivers and streams. Generally unvegetated surfaces; gradational with both units Qf and Qb

Qoal OLDER ALLUVIUM (HOLOCENE AND PLEISTOCENE) — Similar material to unit Qyal, but standing above modern floodplain level and generally separated from it by a distinct topographic scarp. In the Skykomish River valley, terrace sequence is indicated by subscripts, from 1 (oldest) to 3 (youngest)

NON-GLACIAL AND GLACIAL DEPOSITS

Qtb TRANSITIONAL BEDS (PLEISTOCENE) — Pre-Vashon and early Vashon-age deposits of laminated clayey silt to clay; occasional dropstones present. Grades upward into unit Qva

Qpf NON-GLACIAL AND GLACIAL SEDIMENTARY DEPOSITS OF PRE-FRASER GLACIATION AGE (PLEISTOCENE) — Deeply weathered stratified sand and gravel, or clay-rich diamicton. Strong in-place weathering is indicated by oxidation, grusification, rind development, and clay mineral development throughout the depth of exposure. Consists of deposits with a wide age range (before the Fraser glaciation). Shown as magenta diagonal lines when combined with other units

GLACIAL DEPOSITS

ALPINE DRIFTS AND RELATED DEPOSITS (HOLOCENE AND PLEISTOCENE) — Divided into:

Qagt GLACIAL AND TALUS DEPOSITS — Similar material to unit Qt but showing distinct lobate form, indicating deposition at terminus of small glacier or permanent snowfield, or an active rock glacier. Generally unvegetated surfaces

Qaag ALPINE GLACIAL DEPOSITS — Ranges from till in uplands and upvalley to gravelly outwash on broad valley floors. On valley sides includes areas veneered with drift but also showing bedrock, alluvial fans, colluvium, or talus deposits. On valley floors may also include small fans, bog deposits and modern stream alluvium. Areas of thin sparse drift with sporadic bedrock exposures generally included in this unit as well. In the headward reaches of alpine streams, grades into unit Qagt

Qaat ALPINE TILL — Fresh diamicton of locally derived lithologies, similar to till mapped as part of unit Qaag

Qams ALPINE DRIFT OF MT. STICKNEY — Till and stratified drift forming a broad moraine ridge extending northwest from Mt. Stickney

Qaod OLDER ALPINE DRIFT, UNDIVIDED — Moderately to strongly weathered older diamicton. The lithologic composition of this deposit indicates transport and deposition by alpine glaciers

DEPOSITS OF VASHON STAGE OF FRASER GLACIATION OF ARMSTRONG AND OTHERS (1965) (PLEISTOCENE) — Divided into:

Qvr* RECESSIONAL OUTWASH DEPOSITS — Stratified sand and gravel, moderately to well sorted, and well bedded silty sand to silty clay. These deposits represent predominantly outwash-plain and valley-train environments in the lowland areas that may, locally, be divided into:

Qvrs* Sand-dominated recessional outwash deposits

Qvrg* Gravel-dominated recessional outwash deposits

Qvri* Fine-grained deposits of ice-dammed lakes

Qvrm* Deposits of ice- or debris-dammed marginal lakes — Restricted to the major west-draining alpine valleys

Where units Qvr and Qvt are mapped together, topographic form of composite unit is controlled by the underlying till, but the unit is blanketed with near-continuous cover of fluvial sedimentary materials. This composite unit is gradational with both units Qvr and Qvt

Qvi* ICE-CONTACT DEPOSITS — Deposits are similar in texture to unit Qvr but show structures or morphology that indicate deposition in close proximity to active or stagnant ice. Numerical subscripts (shown on geologic map) follow same conventions as noted (see *footnote on correlation diagram) for the recessional outwash deposits units. Locally divided into:

Qvik* Kame and kettle deposits — Underlie areas with characteristic topographic form indicative of deposition around or above stagnant ice

Qvim* Moraines and valley-mouth embankment deposits — May include a high percentage of loose to compact diamicton beneath and interstratified with fluvial materials, deposited at or near active ice margins

Qvt TILL — Mainly compact diamicton with subangular to rounded clasts, glacially transported and deposited. In ice-marginal areas or where covered by a thin layer of recessional outwash, contact with unit Qvi or Qvr is gradational. In certain areas where both till and bedrock are mapped together, overall topographic form of unit is controlled by bedrock with exposures of both materials present. Composite unit includes areas with colluvium of angular clasts and uniform lithology in close proximity to till with or without corresponding bedrock exposures. Shown as beige diagonal lines when combined with other units. Also locally includes:

Qvts Intratill stratified sedimentary deposits — Minor deposits of inferred subglacial fluvial origin, usually interbedded with till (Qvt)

Qva ADVANCE OUTWASH DEPOSITS — Well-bedded gravelly sand to fine-grained sand, generally firm and unoxidized; deposited by proglacial streams

Qvu DRIFT, UNDIVIDED

Qtu TILL, UNDIVIDED (PLEISTOCENE) — Compact diamicton for which weathering and stratigraphic position are insufficient to assign to either unit Qvt or Qpf. On the west edge of the map, may include small areas of non-glacial sedimentary deposits

Qdu GLACIAL DRIFT, UNDIVIDED (PLEISTOCENE)

BEDROCK

Ts SEDIMENTARY ROCKS (TERTIARY) — Moderately to deeply weathered sandy pebble conglomerate to fine grained sandstone. Quartzose pebbles common in coarser grained deposits; mica common in fine-grained sandstone

Ti INTRUSIVE ROCKS (TERTIARY) — Mostly biotite-hornblende and hornblende-biotite granodiorite and tonalite, but locally includes quartz diorite, quartz monzonite, and granite

Tvs VOLCANIC AND SEDIMENTARY ROCKS (TERTIARY) — Mostly andesite and andesitic breccias and tuffs with minor basalt, dacite, and rhyolite. Southwest of the Snoqualmie River, sandstone, siltstone, and conglomerate predominate

pTm MELANGE (PRE-TERTIARY) — Argillite, phyllite, graywacke, chert, greenstone, marble, amphibolite, metatonalite, and metagabbro; pervasively sheared and disrupted. Sheared argillite commonly forms a matrix for blocks whose dimensions may range from one to thousands of meters

br BEDROCK, UNDIVIDED — Combined with other units

CONTACT

HIGH ANGLE FAULT — Bar and ball on downthrown side

15 STRIKE AND DIP OF INCLINED BEDDING IN BEDROCK

10 STRIKE AND DIP OF FOLIATION IN METAMORPHIC ROCKS

25 STRIKE AND DIP OF BEDDING IN GLACIAL OUTWASH DEPOSITS

TILL FABRIC — Symbol aligned with consistent horizontal trend of long axis of pebbles

STRIATION — Direction of motion, where available, indicated by arrow. Multiple ice-flow directions indicated by superimposed symbols

FLOW OF GLACIAL MELT-WATER — Inferred from surface morphology

TERRACE — Edge of fluvially deposited material, subsequently incised, indicated by solid line. Hachures on eroded scarp face

ICE-FLOW INDICATOR — Elongate hills, valleys, and closed depressions inferred to show direction of basal ice motion

APPROXIMATE LIMIT OF VASHON-AGE ICE SHEET

CREST OF MORaine ASSOCIATED WITH VASHON-AGE ICE SHEET

CREST OF MORaine ASSOCIATED WITH ALPINE GLACIERS

CHANNELWAY

DIRECTION OF LANDSLIDE MOTION

VASHON-AGE RECESSONAL SPILLWAY — Altitude of spillway controlled the level of impounded recessional meltwater (numerical corresponds to recessional interval as described on correlation chart)

CORRELATION AND DESCRIPTION OF MAP UNITS
SURFICIAL GEOLOGIC MAP OF THE SKYKOMISH AND SNOQUALMIE RIVERS AREA,
SNOHOMISH AND KING COUNTIES, WASHINGTON

By
Derek B. Booth
1990