GEOLOGY OF WHITE PASS-TUMAC MOUNTAIN AREA, WASHINGTON

by Geoff Clayton, 1980

WASHINGTON DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND EARTH RESOURCES

Open File Report No. 80-8

White Pass

EXPLANATION

- Volcanic domes, cones, vent agglomerate and or pyroclastic breccia
- direction of flow of lava
- strike and dip of bedded rocks; horizontal bedded rocks; vertically bedded rocks
- strike and dip of joints; strike and dip of metamorphic foliation; vertical metamorphic foliation
- contact exposed in part
- hidden contact
- ? inferred contact
- fault exposed in part with relative down dropped or uplifted block in dotted. Slump scarps included here
- hidden fault contact
- ? inferred fault contact
- Rt. 12 White Pass Highway
- Goat Rocks Wilderness Boundary
- Lake
- geochemical sample taken within area bounded by the triangle
- geochemical sample taken from the unit indicated but not within the area bounded by the triangle
- Normal; Reversed; Skewed; No signal — Remnant magnetic polarity sample taken within the area bounded by the circle. magnetization too weak to measure.

Holocene

- **Qal** River alluvium
- **Qls** Landslide and talus colluvium
- **Qgd** Glacial drift, Fraser Glaciation
- **Qgt** Glacial till
- **Qgl** Glacial lacustrine sediments

Pleistocene

Modified Larsen Index: % SiO_2, % K_2O, (% SiO_2-CaO-% K_2O)

- **Qhd** 65.25 1.5 17.5 — Hornblende dacite of Spiral Butte
- **Qhacf** 62.3 1.2 13.6 — Hornblende andesite of Clear Fork Cowlitz Creek
- **Qhopl** 60.6 2.8 13.9 — Hornblende andesite of Deer Lake
- **Qhadl** 61.9 1.1 13.2 — Hornblende andesite of Deer Lake Mountain
- **Qhejl** 60.5 1.2 12.0 — Hornblende andesite of the Jess Lake Complex
- **Qharm** 61.5 1.5 13.1 — Hornblende andesite of Round Mountain
- **Qhar** 58.0 1.2 9.8 — Hornblende andesite of Russel Ridge
- thin bedded olivine basalt flows and diabase sills and dikes
- **Qhm** Hogback Mtn. basalts, pyroxene andesites, hornblende andesites. thick bedded grey olivine basalt
- basalt, pyroxene andesite, and hornblende andesite flows

Qbt Basalt of Tumac Mtn. olivine bearing basaltic andesite, contemporaneous with hornblende andesites

Qhau Hornblende andesite undifferentiated

- **Qgt_2** Glacial till older than Fraser glaciation
- **Qpop** Pyroxene andesite of Penoyer Lake Creek
- **Qbp** Basalt of Penoyer Lake Creek
- **Qgt_3** Glacial till beneath recessional moraine; probably less than 2 meters overlies Russel Ranch Fm.

inversion of relief - Tieton andesite forms Pinegrass Ridge 3,000 above present Tieton River valley bottom.

- **Qtpa** Tieton Andesite (pyroxene) ≈60.5 ≈2.5 ≈1.0 K-Ar date 930,000 and 1.05±.1 my.
- **TQa** Andesite dikes: plagioclase pyroxene phenocrysts

QTvu volcanics undifferentiated

inversion of relief

- **Tpd** Dacite flows, tuffs, presently occupy ridge top position through inversion of relief. Abundant hbld, biotite, plagioclase, and qtz phenocrysts. ≈ 66.0 ≈1.6 ≈16.5

Tpa Tertiary (pliocene?) andesite

angular unconformity

- **Tvpa** Pyroxene andesite
- **Tvb** Basalt
- **Tvha** Hornblende andesite
- **Tvr** rhyolite

Tvu Tertiary volcanics undifferentiated

- **Ts** Sedimentary rocks, chert pebble conglomerate, carbonaceous arkose, lithic tuff and argillite

To To Ohanapecosh Formation

angular unconformity, planing down of pre-Tertiary terrain to low relief

Jurassic

- **Jr** Russel Ranch Formation radiolarian date, D. Jones U.S.G.S.
- **Pls** Limestone float, not yet found in place. Permian age inferred by Ellingsen
- **Ja** Indian Creek amphibolite, diorite quartzite, marble, ultramafite, with age of metamorphism 185 my

Eocene

Oligocene

Mio-Pliocene

PLUTONIC ROCKS

- **Tpd** Dacite, granodiorite - intrusive? phase of flows + Tvu?
- **Thi** Hornblende diorite dikes
- **Tiu** Undifferentiated intermediate intrusive rocks.
- **Tdi** Diorite sills and dikes, hbld, px, plag.
- **Tijl** Jug Lake qtz diorite, diorite granodiorite dikes + small intrusions
- **Tog** Oligocene granite of Bumping Lake. Fission track ≈ 26 my

Qbkl Basalt of Kincaid Lake olivine bearing basaltic andesite. Fraser age glacial till on Hornblende andesite of Deer Lake overlies an olivine bearing basaltic andesite flow at a falls of the South Fork of Clear Creek; which in turn overlies glacial till and pumiceous Russel Ranch Formation

Qbu Basalt undifferentiated

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SCALE 1:24 000

1 MILE; 1000 0 1000 2000 3000 4000 5000 6000 7000 FEET; 1 KILOMETER

121°22'30" White Pass

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Because the handwritten legend couldn't be read electronically, it was typed over the the original scan,
and because the typed text did not transfer to the PDF when the type was made invisible, this page was added as searchable text.
It is essentially an overlay.

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Volcanic domes, cones, vent agglomerate and or pyroclastic breccia

direction of flow of lava

strike and dip of bedded rocks
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Qgt_1 — Glacial till

Qgl_l — Glacial lacustrine sediments

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Qhd — Hornblende dacite of Spiral Butte

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Qhacf — Hornblende andesite of Clear Fork Cowlitz Creek

Qhapl — Hornblende andesite of Pear Lake

Qbt — Basalt of Tumac Mtn. olivene bearing basaltic andesite contemporaneous with hornblende andesites

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Pleistocene

Qhadl — Hornblende andesite of Deer Lake Mountain

Qhajl — Hornblende andesite of Jess Lake Complex

Qharm — Hornblende andesite of Round Mountain

Qhar — Hornblende andesite of Russell Ridge

Qhau — Hornblende andesite undifferentiated

Qbcc

Qgt_2

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Qgt^2 — Fraser age glacial till or Hornblende andesite of Deer Lake overlies and olivine bearing basaltic andesite at a falls of the South Fork Clear Creek, which in turn overlies glacial till emplaced on Russell Ranch Formation

Qbu

Qhm — thin bedded olivine basalt flows and diabase sills and dikes Hogback Mountain basalts, pyroxene andesites, hornblende andesites; thick bedded gray olivine basalt basalt, pyroxene andesite, and hornblende andesit flows

Qgt_2 — Glacial till older than Fraser Glaciation

Qpap — Pyroxine of Penoyer Lake Creek

Qbp — Basalt of Penoyer Lake Creek

Qgt_3 — Glacial till beneath reversed magnetic polarity lava flows. Overlies Russell Ranch Formation

Qbu — Basalt undifferentiated

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inversion of relief

Mio-Pliocene

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Tpa — Tertiary (Pliocene?) andesite

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