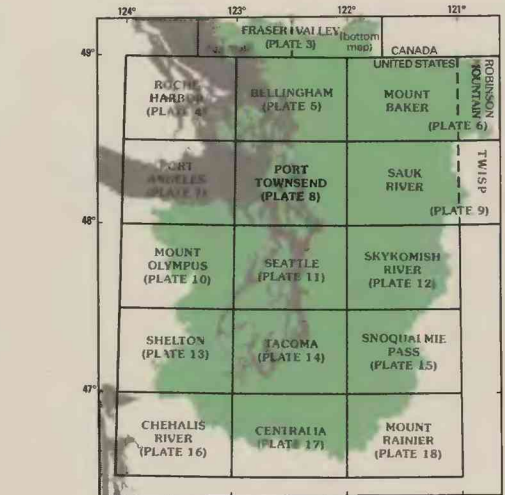
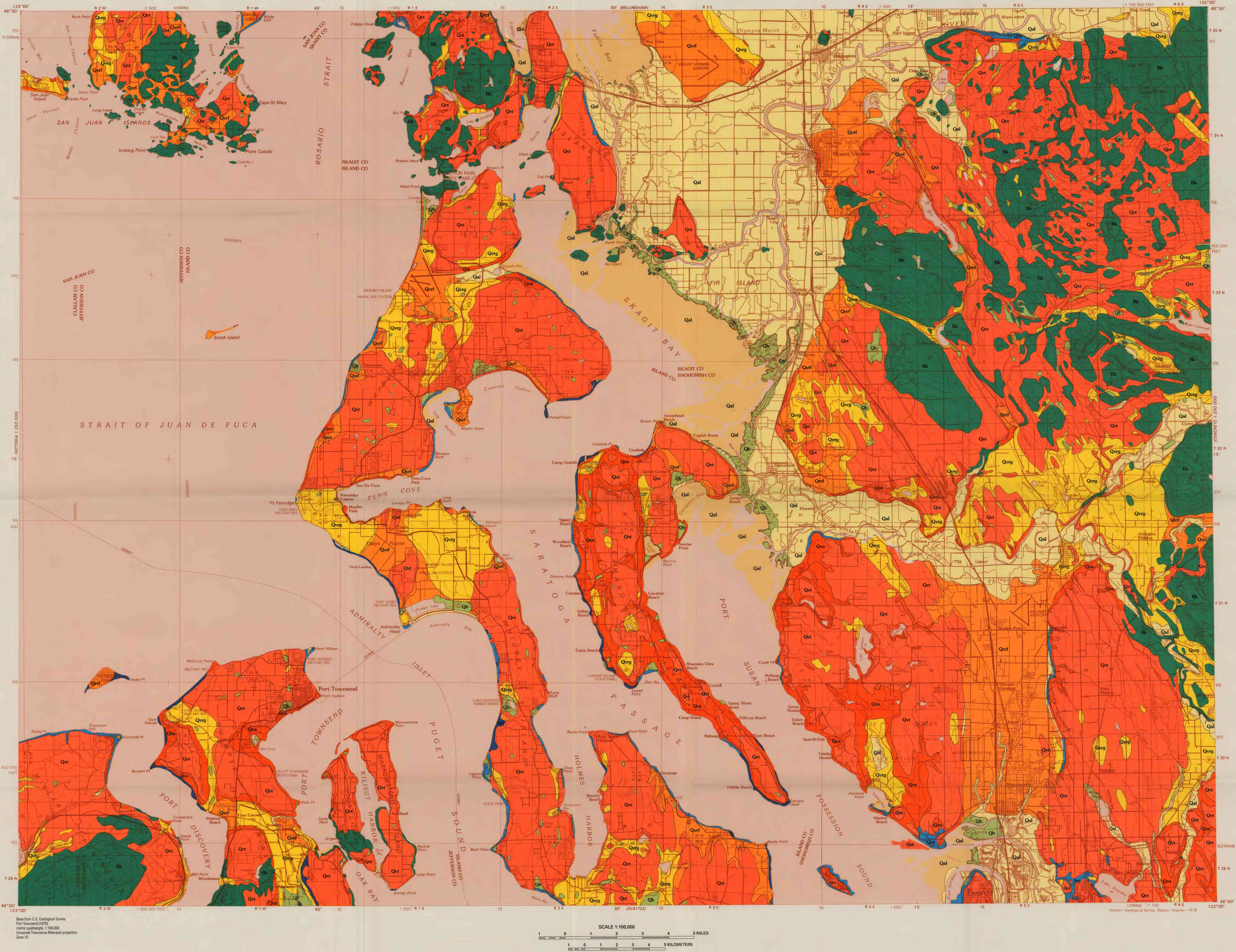




- EXPLANATION**
- Qal** Alluvium (Holocene)—Grades from clay to gravel, consists predominantly of organic-rich silt to fine sand. The alluvium is generally represented by small discontinuous deposits within smaller river and stream beds; but can be quite extensive in the large river valleys and floodplains; also included are deposits of artificial fill, modified land, alluvial fan deposits, and tidal flat deposits
 - Qb** Marsh, bog, and peat deposits (Holocene and Late Pleistocene)
 - Qvrg** Vashon recessional outwash deposits (Pleistocene)—Moderately to poorly sorted gravel and sand with small amounts of silt and clay; include ice-contact deposits, recessional marine deposits, and alluvial fan deposits. Qvrg consists of the coarser deposits and Qvt generally consists of the finer deposits
 - Qvt** Vashon till (Pleistocene)—Predominantly fine-grained deposits consisting of unsorted and unstratified glacial sediments from clay to boulder in size that vary in compaction and composition throughout the Puget Sound Lowland
 - Qva** Vashon advance outwash deposits (Pleistocene)—Consist of stratified and cross-bedded gravels and coarse sands with lenses of silt and clay; may also include the Esperance sand, Lawton clay, and Plichuck clay members
 - Qint** Interglacial floodplain deposits (Pleistocene)—Consisting of interbedded sand, silt, clay and peat of the Whiskey or Kitsap Formations; may also include the basal part of the early advance outwash deposits, such as the Lawton and Plichuck clay members
 - Qp** Pre-Fraser undifferentiated glacial deposits (Pleistocene)
 - Bk** Bedrock—Tertiary and older volcanic and sedimentary rock, undifferentiated
 - Hydrogeologic contact

REFERENCES (PORT TOWNSEND)

Anderson, H.W., Jr., 1968. Ground-water resources of Island County, Washington: Washington Department of Water Resources Water-Supply Bulletin 25, part II, 317 p.

Associated Earth Sciences, Inc., 1990. Miller Peninsula Project, geology, soils, geologic hazards and ground water hydrogeology: Associated Earth Sciences, Inc., pre-final, Project No. 9008-11, unpaginated.

Easterbrook, D.J., 1968. Pleistocene stratigraphy of Island County, Washington: Washington Department of Water Resources Water-Supply Bulletin 25, part I, 34 p., 1 pl.

Jones, M.A., 1985. Occurrence of ground water and potential for seawater intrusion, Island County, Washington: U.S. Geological Survey Water-Resources Investigations Report 85-4046, 6 sheets.

Newcomb, R.C., 1952. Ground-water resources of Snohomish County, Washington: U.S. Geological Survey Water-Supply Paper 1135, 133 p.

Pest, Fred, Jr., Dethier, D.P., Booth D.B., and Minard, J.P., 1969. Surficial geologic map of the Port Townsend 30- by 60-minute quadrangle, Puget Sound region, Washington: U.S. Geological Survey Miscellaneous Investigations Series Map I-1198-F, 13 p., 1 plate, scale 1:100,000.

Scow, J.E., 1950. Preliminary report on the ground-water resources of southwestern Skagit County, Washington: U.S. Geological Survey Open-File Report, 40 p.

Washburn, R.L., 1954. Preliminary investigation of ground water in East Sound area, Orcas Island, San Juan County, Washington: U.S. Geological Survey Open-File Report, 26 p.

—1978a. Coastal zone atlas of Washington, v. 3, San Juan County: Washington Department of Ecology DOE 77-21-3, 10 p.

—1978b. Coastal zone atlas of Washington, v. 11, Jefferson County: Washington Department of Ecology DOE 77-21-11, 10 p.

—1978c. Coastal zone atlas of Washington, v. 12, Clallam County: Washington Department of Ecology DOE 77-21-12, 10 p.

—1979a. Coastal zone atlas of Washington, v. 5, Snohomish County: Washington Department of Ecology DOE 77-21-5, 9 p.

—1979b. Coastal zone atlas of Washington, v. 10, Kitsap County: Washington Department of Ecology DOE 77-21-10, 10 p.

—1987. Coastal zone atlas of Washington, v. 2, Skagit County: Washington Department of Ecology DOE 77-21-2, 10 p.

Whiteman, K.J., Molenaar, Des, Bortleson, G.C., and Jacoby, J.M., 1983. Occurrence, quality, and use of ground water in Orcas, San Juan, Lopez, and Shaw Islands, San Juan County, Washington: U.S. Geological Survey Water-Resources Investigations Report 83-4019, 12 sheets, scale 1:62,500.

SURFICIAL HYDROGEOLOGIC UNITS OF THE PUGET SOUND AQUIFER SYSTEM, WASHINGTON AND BRITISH COLUMBIA, FOR THE PORT TOWNSEND QUADRANGLE

By
M.A. Jones
1998

