3D geologic map of the Utsalady and Conway 7.5-minute quadrangles, Skagit, Snohomish, and Island Counties, Washington

Disclaimer

Citation and link

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

This 3D geologic map is derived from previously published geologic mapping and analysis. Some of the borehole data are considered preliminary and have not been examined for accuracy of either location or lithologic identification. While lithologic identification for all wells was made by the author of the published geologic map, not all of the wells shown in this 3D product were necessarily used to construct the geologic cross section. The map, cross section, and the borehole data within the 3D model are not intended for analytical use. Instead, the published map and (or) pamphlet should be consulted for original data and interpretation.

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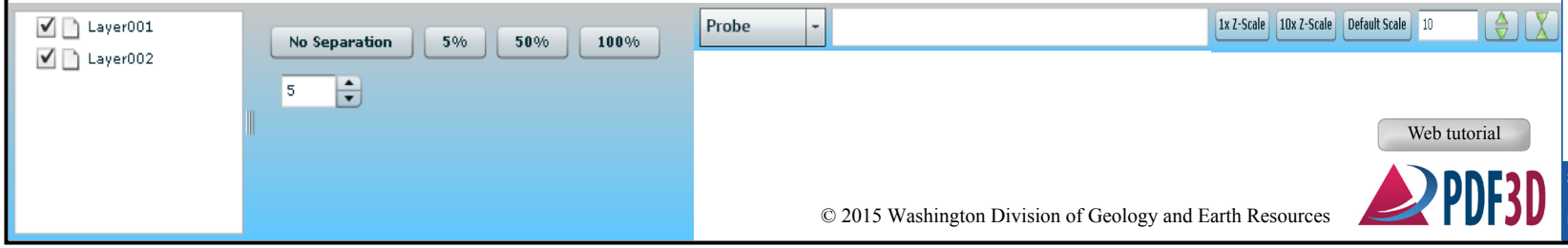
3D PDF INSTRUCTIONS

NAVIGATION
(1 of 2)

- Click inside the window to manipulate the 3D view—the compass will rotate to point towards north
- Hold the left mouse button and move the mouse to tilt the view
- Use the mouse wheel to zoom
- Hold both the right and left mouse buttons to pan the view
- Toggle individual layers in the lower left corner
- Change the vertical scaling or layer separation in the lower toolbar
- Selecting an object will display its data below

OBJECT DATA



Web tutorial

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PDF3D

3D model creation: Ashley A. Cabibbo

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WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
OPEN FILE REPORT 2002-5; REVISED 2004
PLATE 1

Geologic Map of the Utsalady and Conway 7.5-minute Quadrangles, Skagit, Snohomish, and Island Counties, Washington

by
Joe D. Dragovich, Lea A. Gilbertson, David K. Norman,
Garth Anderson, and Gary Petro

2002
Revised 2004

Geologic Units

QUATERNARY SEDIMENTARY AND VOLCANIC DEPOSITS

Holocene Nonglacial Deposits

- af — Fill
- Qb — Beach deposits (Holocene)
- Qn — Nearshore deposits (Holocene)
- Qm — Marsh deposits (Holocene)
- Qas — Skagit River alluvium, undivided (Holocene)
- Qasl — Sand levees (Holocene)—Overbank sand deposits of the Skagit River
- Qp — Peat (Holocene)
- Qal — Alluvial fan deposits (Holocene to latest Pleistocene)
- Qls — Landslide deposits, undivided (Holocene to latest Pleistocene)
- Qvl — Lahar runout deposits (Holocene)

Pleistocene Glacial and Nonglacial Deposits

- Qgdm$_{ve}$ — Everson glaciomarine drift, undivided (Pleistocene)
- Qgdm$_{ec}$ — Everson fine-grained glaciomarine sediment (Pleistocene)
- Qgdm$_{ed}$ — Everson glaciomarine diamicton (Pleistocene)
- Qgo$_{te}$ — Everson terrestrial to marine recessional outwash (Pleistocene)
- Qgxd$_{e}$ — Everson deltaic outwash complex (Pleistocene)
- Qgom$_{ve}$ — Everson glaciomarine drift, undivided (Pleistocene)
- Qgom$_{ee}$ — Everson emergence (beach) deposits (Pleistocene)
- Qgt$_{v}$ — Vashon till (Pleistocene)
- Qgo$_{v}$ — Vashon advance outwash (Pleistocene)
- Qgs$_{v}$ — Transitional silt and clay deposits (Pleistocene)
- Qc$_{o}$ — Olympia nonglacial deposits (Pleistocene)

TERTIARY SEDIMENTARY AND VOLCANIC ROCKS

- Ec$_{bs}$ — Rocks of Bulson Creek, upper lithofacies (Oligocene to Eocene)
- Ec$_{bcg}$ — Rocks of Bulson Creek, lower conglomeratic lithofacies (Oligocene to Eocene)
- Ev^{a} — Andesitic to rhyolitic volcanic rocks (Eocene)
- Ec$_{b}$ — Chuckanut Formation, Bellingham Bay Member (Eocene)

MESOZOIC LOW-GRADE METAMORPHIC ROCKS OF THE DARRINGTON–DEVILS MOUNTAIN FAULT ZONE

- KJmv$_{g}$ — Goat Island terrane metasedimentary rocks (Cretaceous to Jurassic)
- KJmv$_{g}$ — Goat Island terrane metavolcanic rocks (Cretaceous to Jurassic

MESOZOIC LOW-GRADE METAMORPHIC ROCKS OF THE NORTHWEST CASCADES SYSTEM

- JHmv$_{h}$ — Helena–Haystack mélange greenstone (Jurassic)
- Juv$_{h}$ — Helena–Haystack mélange ultramafite (Jurassic)
- Juv$_{c}$ — Helena–Haystack mélange silica-carbonate rocks (Jurassic)
- JHmv$_{h}$ — Helena–Haystack mélange metasedimentary rocks, chert-bearing (Jurassic)

Geologic Symbols

- Contact—Dashed where inferred
- Fault—Dashed where inferred; dotted where concealed
- Strike-slip fault—Arrows show relative horizontal movement; dotted where concealed
- Thrust fault—Sawteeth on upper plate; dotted where concealed
- Oblique-slip fault—Arrows show relative horizontal movement, dashed where inferred; dotted where concealed, bar and ball on downthrown side; queried where presence or character uncertain
- Syncline—Showing direction of plunge; dotted where concealed
- Anticline—Dotted where concealed
- Overturned anticline—Dashed where approximately located; dotted where concealed

Strike and dip of Quaternary bedding

- inclined (glacial deposits only); T'adjacent to symbol indicates foreset bedding
- orientation of overturned, glacial ice shear -induced fold axes in thinly bedded advance outwash

Strike and dip of Tertiary bedding

- horizontal
- inclined; T' adjacent to symbol indicates foreset bedding
- vertical
- overturned

Strike and dip of syn- to late-metamorphic cleavage (may be combined with other symbols)

- inclined
- vertical

Strike and dip of fracture cleavage

- inclined
- vertical

Lineation; arrow indicates direction of plunge

- inclined

Composite well shown on cross section using information from two or more water well boring logs

SCALE 1:24000

1 MILE 1/2 0 1
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER 1/2 0 1

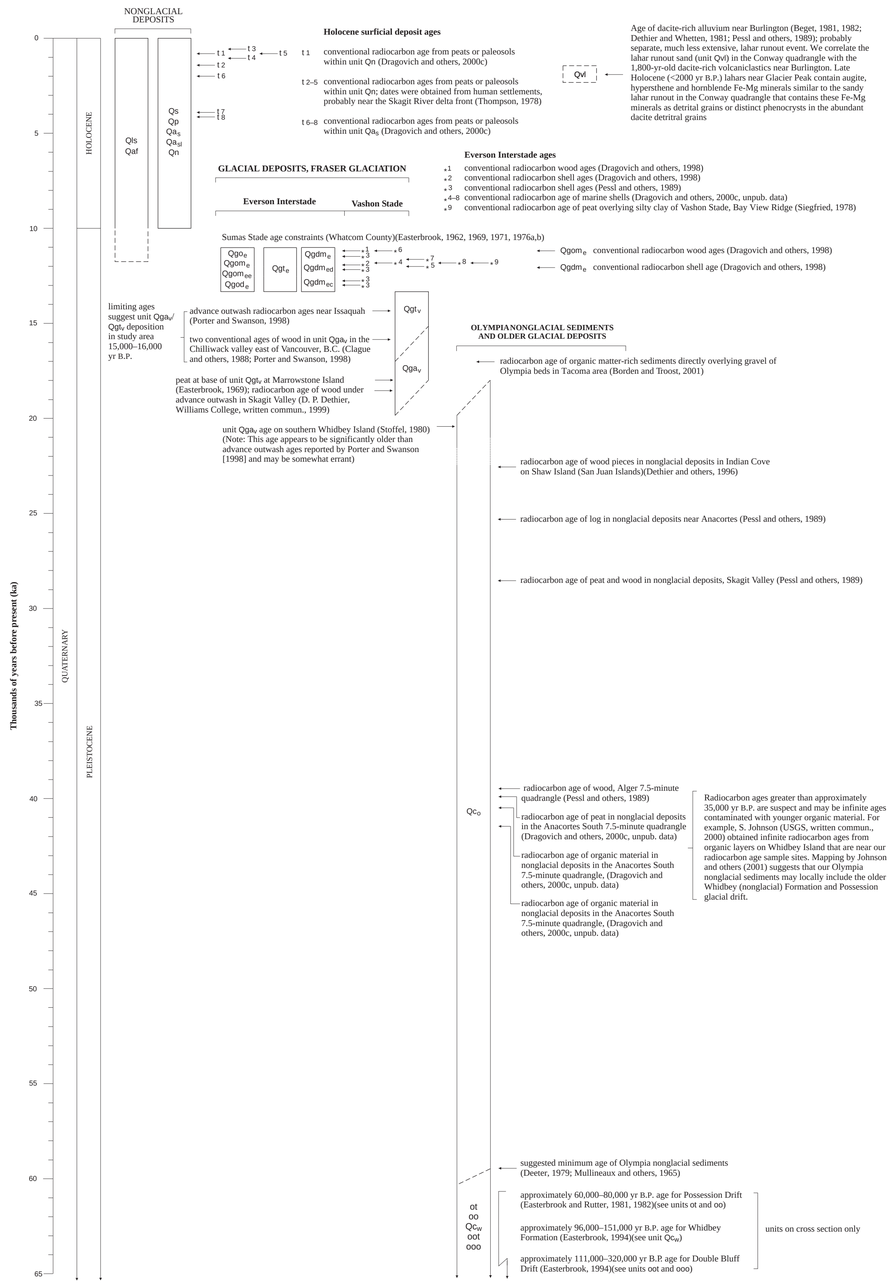
Produced in cooperation with the U.S. Geological Survey
National Cooperative Geologic Mapping Program
Agreement Number 00HQAG0107

Contour interval 20 feet
Supplementary contours at 5 feet above sea level
National Geodetic Vertical Datum of 1929

Lambert Conformal Conic Projection
Washington State Plane South
1927 North American Datum
The base map is derived from Washington State Department of Natural Resources database
Cartographic design and production by Anne C. Heinitz, Keith G. Ikerd, and Donald T. McKay, Jr.
Washington Division of Geology and Earth Resources, 2001

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands
Division of Geology and Earth Resources
Ron Teissere, State Geologist

QUATERNARY UNITS CORRELATION DIAGRAM



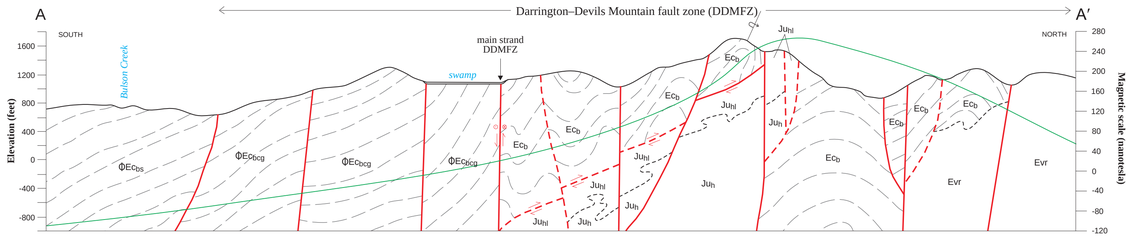
BEDROCK UNITS CORRELATION DIAGRAM (PROTOLITH AGES)

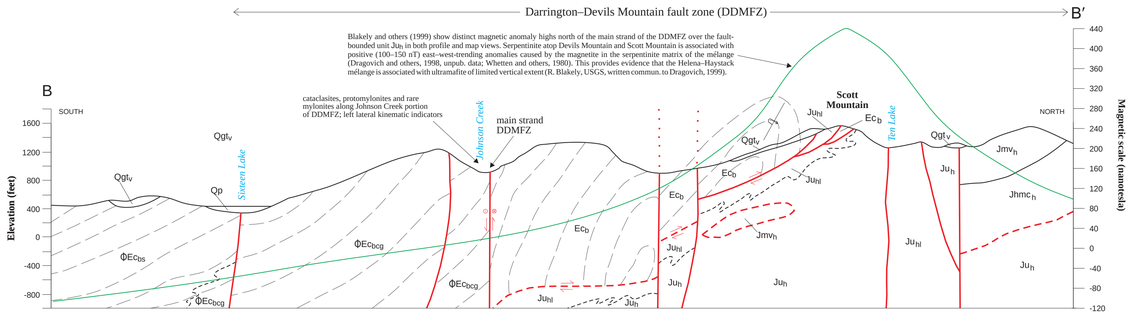
Ages of Cretaceous stage boundaries are from Obradovich (1994)

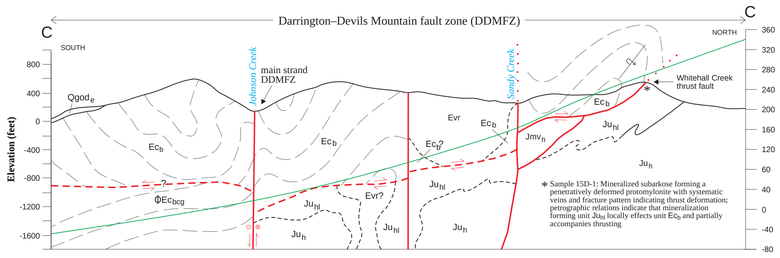
Produced in cooperation with the U.S. Geological Survey
National Cooperative Geologic Mapping Program
Agreement Number 00HQAG0107

Cartographic design and production by
Keith Ikerd, Anne Heinitz, Chuck Caruthers, and Jari Roloff
Washington Division of Geology and Earth Resources

BEDROCK CROSS SECTIONS A, B, AND C







EXPLANATION FOR CROSS SECTIONS A, B, AND C

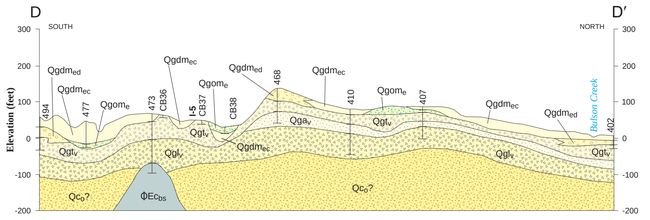
- Contact; dashed where inferred
- Overturned fold axis
- Fault, dashed where inferred, dotted where projected; arrows indicate relative dip-slip motion; circled dot indicates relative strike-slip motion toward viewer, circled x away
- Inferred bedding trace; locally projected above erosional surface
- Total magnetic field anomaly cross section (Blakely and others, 1999)

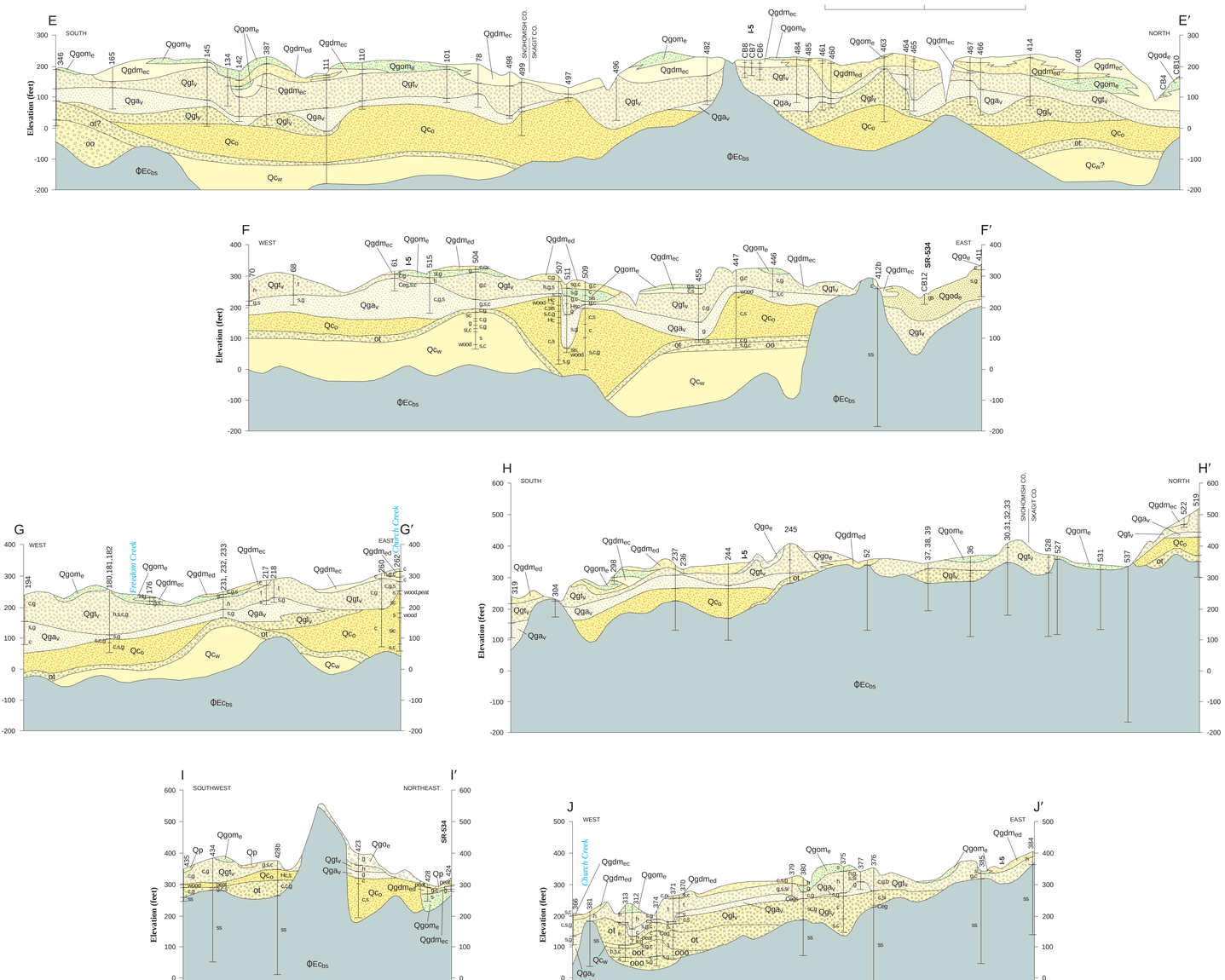
scale 1:12,000; no vertical exaggeration

0 .5 1 mile
0 1000 2000 3000 4000 5000 feet
0 .5 1 kilometer

GLACIAL UPLANDS CROSS SECTIONS D, E, F, G, H, I, AND J

(See Fig. 5 in text for cross section K)





EXPLANATION FOR CROSS SECTIONS D, E, F, G, H, I, AND J

Geological Units on Cross Sections Only

Possession Glaciation

- oo — Older outwash (Pleistocene)—Pre-Fraser glacial or nonglacial sediments
- ot — Older till (Pleistocene)—Clay, silt, sand, and gravel

Double Bluff Glaciation

- oot — Till (Pleistocene)—Compact till and diamicton interbedded with sand and silt
- ooo — Outwash (Pleistocene)—Gravel and moderately well-sorted, cross-bedded sand

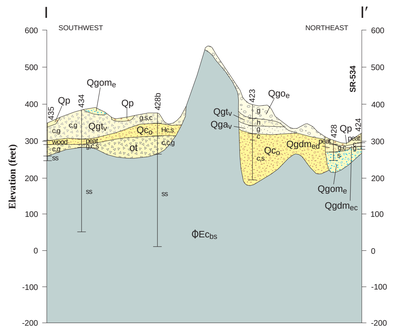
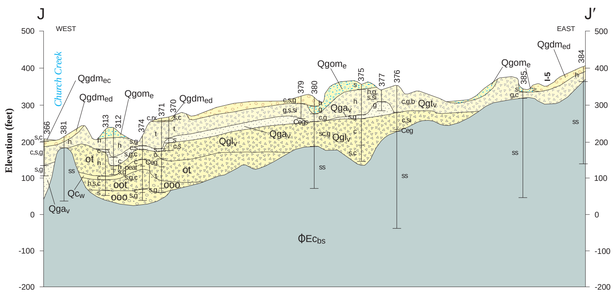
Whidbey Nonglacial Interval

- Qc_w — Whidbey nonglacial deposits (Pleistocene)—Mostly sand with interbeds of silt, clay, sandy clay, and silty clay

Well Log Information

Material		Bedrock	
s	sand	ss	sandstone
c	clay	**Density**	
h	hardpan	H	hard
b	boulders	St	soft
rx	rocks	Cx	cemented
l	loam	Example: sfc,si,s,g denotes soft clayey silty sandy gravel (diamicton)	
si	silt		
g	gravel		
t	till		

467 number type indicating water well
CB4 letter prefix indicates geotechnical boring

scale 1:24,000; vertical exaggeration 10x

0 1 2 miles
0 2000 4000 6000 8000 feet
0 1 2 kilometers