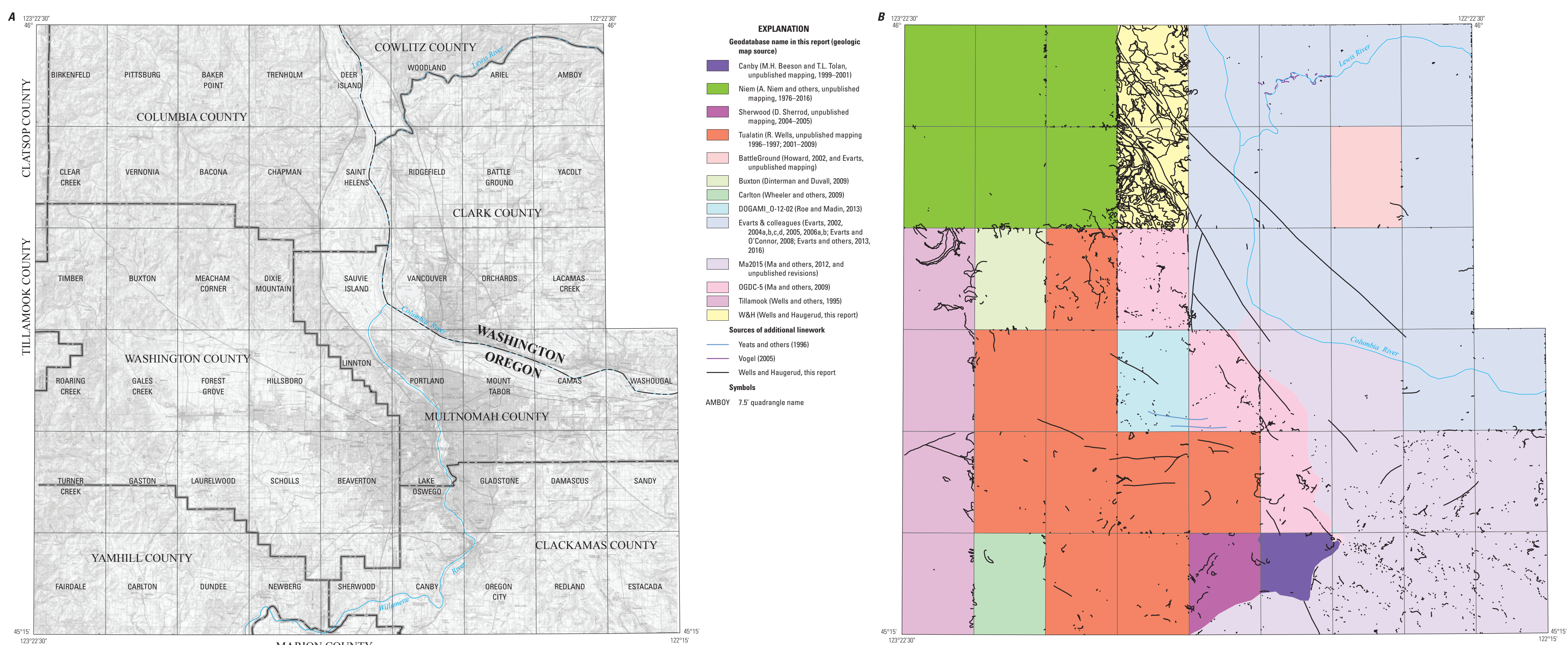


LIST OF MAP UNITS			
UNCONSOLIDATED DEPOSITS		Tsm	Sandy River Mudstone (Pliocene and Miocene)
af	Artificial fill (Holocene)	Tr	Rhoddendron Formation (Pliocene and Miocene)
Qs	Alluvium (Holocene)	ROCKS OF THE HIGH CASCADE RANGE	
Qls	Landslide deposits (Holocene and Pleistocene)	Thb	Basalt (Pliocene)
Qlo	Older landslide deposits	COLUMBIA RIVER BASALT GROUP AND RELATED STRATA	
Qr	Talus (Holocene and Pleistocene)	Wanapum Basalt (Miocene)	
Qaf	Alluvial fan deposits (Holocene)	Twpr	Priest Rapids Member
Qla	Lacustrine deposits (Holocene and Pleistocene)	Basalt of Rosalia of Beeson and others (1989a)	
Qe	Eolian deposits (Holocene and Pleistocene)	Twfs	Frenchman Springs Member
Ql	Löss	Twfh	Basalt of Sentinel Gap of Mackin (1961)
Qtd	Terrace deposits (Holocene and Pleistocene)	Twfg	Basalt of Sand Hollow of Mackin (1961)
Qty	Younger terrace deposits (Holocene and Pleistocene?)	Ellensburg Formation (Miocene)	
Qo	Older terrace deposits (Pleistocene)	Tr	Vantage Member
Mount St. Helens-derived deposits (Holocene and Pleistocene)		Grande Ronde Basalt (Miocene)	
Qoy	Youngest terrace deposits (Holocene)	TgN2	N2 flows
Qsa	Deposits of Swift Creek eruptive stage (Pleistocene)	Tgdb	Sentinel Bluffs Member
Qsc	Deposits of Cougar eruptive stage (Pleistocene)	Tgww	Winter Water Member
Qsa	Deposits of Ape Canyon eruptive stage and older (Pleistocene)	Tgti	Umtanum flow
Mount Hood-derived terrace deposits (Holocene and Pleistocene)		Tgso	Ortley member
Qh3	Youngest terrace deposits (Holocene)	Tgbc	Buttermilk Canyon member
Qh2	Older post-Missoula deposits (Holocene and Pleistocene)	Tgae	Armstrong Canyon member
Qh1	Oldest pre-Missoula deposits (Pleistocene)	Tgru	N2 and R2 flows
Qf	Missoula flood deposits (Pleistocene)	TgR2	R2 flows
Qlc	Coarse-grained Missoula flood deposits	Tgpc	Grouse Creek member
Qgs	Older sand and gravel (Pleistocene)	Tgwr	Wapshilla Ridge member
Older glacial deposits (Pleistocene)		TgN1	N1 flows
Qga	Amboy Drift	Tgpg	Downey Gulch member
Qgm	Drift of Mason Creek	Tgc	Chastic rocks associated with Grande Ronde Basalt (Miocene)
Qgo	Older outwash	Mist formation	
Qcb	Basaltic colluvium (Pleistocene)	Tmgs	Gus Creek conglomerate
SEDIMENTARY AND VOLCANIC FILL OF THE PORTLAND, TUALATIN, AND NORTHERN WILLAMETTE BASINS		Tmwr	Windy Ridge member
Rocks of the Boring Volcanic Field (Pleistocene and Pliocene)		Tmc	Ivy Creek conglomerate
QT36	90–200 ka (Pleistocene)	INTRUSIVE ROCKS	
QT35	200–350 ka (Pleistocene)	Tiw	Invasive Wanapum Basalt (Miocene)
QT34	0.5–1.3 Ma (Pleistocene)	Tig	Invasive Grande Ronde Basalt (Miocene)
QT33	1.4–1.7 Ma (Pleistocene)	Tiy	Younger intrusions of the Western Cascade Range (Miocene and Oligocene)
QT32	1.9–2.0 Ma (Pleistocene)	Tic	Older intrusions of the Western Cascade Range (Oligocene and Eocene)
QT31	2.2–2.7 Ma (Pleistocene and Pliocene)	Tia	Intrusive rocks of the Coast Range (Eocene)
Qgc	Gravel of Coast Range provenance (Pleistocene)	VOLCANIC AND SEDIMENTARY ROCKS OF THE COAST RANGE	
Qgc	Older gravel of Columbia River origin (Pleistocene and Pliocene)	Ts	Scappoose Formation (Miocene and Oligocene)
Qtc	Older gravel of Cascade Arc origin (Pleistocene and Pliocene)	Tscf	Clatskanie River member (Miocene and Oligocene)
Qth	Hillsboro formation of Wilson (2000) (Pleistocene to Miocene)	Tars	Ribbon Ridge member (Oligocene)
Tl	Troutdale Formation (Pliocene and Miocene)	Tstf	Tuffaceous mudstone
Th	Hyaloclastite sandstone member (Pliocene)	Tsod	Oak Ranch Creek member (Oligocene)
Tc	Conglomerate member (Pliocene to Miocene)	Tsd	Divide member (Oligocene)
		Tpb	Pittsburg Bluff Formation (Oligocene and Eocene)

		EXPLANATION OF MAP SYMBOLS
Tps	Scaponia tuff (Oligocene)	Contact—Dashed where inferred; dotted where concealed; queried where uncertain
Tpe	East Fork member (Oligocene and Eocene)	Fault
Tpp	Pebble Creek member (Eocene)	Fault—Dashed where inferred; dotted where concealed; queried where uncertain
Tsc	Sager Creek formation (Eocene)	Normal fault—Dashed where inferred; dotted where concealed; queried where uncertain. Bar and ball on downthrown block
Tk	Kearsey Formation (Eocene)	Reverse fault—Dotted where concealed. Rectangles on upthrown block
Tks	Sandstone	Strike-slip fault—Dashed where inferred; dotted where concealed; queried where uncertain. Arrows show relative motion
Tku	Upper member	Right-lateral offset
Tkm	Middle member	Left-lateral offset
Tkam	Stimson Mill member	Oblique-slip fault—Dashed where inferred; dotted where concealed; queried where uncertain. Arrows show relative motion. Bar and ball on downthrown block
Tkst	Tuff bed	Right-lateral offset
Tkb	Basal member	Left-lateral offset
Tc	Cowlitz Formation (Eocene)	Thrust fault—Dotted where concealed; queried where uncertain. Sawtooth on upper (tectonically higher) plate
Tcom	Upper mudstone member	Fold
Tcow	Sandstone member	Anticline—Dashed where inferred; dotted where concealed
Th	Hamlet formation (Eocene)	Plunging anticline—Large arrowhead shows direction of plunge
Thsw	Sweet Home Creek member	Syncline axis—Dashed where inferred; dotted where concealed
Ths	Sunset Highway member	Plunging syncline—Large arrowhead shows direction of plunge
Thr	Roy Creek member	Buried surface of Columbia River Basalt Group—Elevation of surface relative to sea level, in feet. Ticks on contours point towards enclosed areas of lower value
Tillamook Volcanics (Eocene)		Caldera margin—Dashed where inferred; dotted where concealed
Tlya	Subaerial flows	Coal bed
Tlvm	Submarine flows and breccias	Igneous dike
Tlwh	Basalt of Waverly Heights (Eocene)	Moraine crest
Ty	Yamhill Formation (Eocene)	Glauconitic-rich bed
Tylr	Siletz River Volcanics (Eocene)	Limit of basal (landslide debris?) in subsurface, from water wells
Tlra	Subaerial flows	Bedding
Tlrf	Silty interbeds	Horizontal
Tlrm	Submarine flows and breccias	Inclined
YOUNGER ROCKS OF THE WESTERN CASCADE RANGE		Approximate inclined
Tys	Volcaniclastic sedimentary rocks (Oligocene)	Vertical
Tyv	Volcanic rocks (Oligocene)	Overturned
Tynd	Dacite	Inclined igneous foliation
Tynd	Andesite	Inclined cleavage
Tyba	Basaltic andesite	Platy parting
Tyba	Basalt	Joint
Tyb	Basaltic andesite of Elkhorn Mountain (Oligocene)	Inclined
Tyb	Basalt	Vertical
OLDER ROCKS OF THE WESTERN CASCADE RANGE		
Tos	Volcaniclastic sedimentary rocks (Oligocene and Eocene)	
Tot	Tuff (Oligocene and Eocene)	
Tov	Volcanic rocks (Oligocene and Eocene)	
Tovr	Rhyolite	
Tovd	Dacite	
Tova	Andesite	
Tovba	Basaltic andesite	
Tovb	Basalt	
Ttsp	Tuff of Davis Peak (Eocene)	
Togv	Goble Volcanics (Eocene)	
		Sample location (name in geodatabase)
		Luminescence age (LuminescenceAge)Points—See luminescence ages of surficial deposits in table 2 in pamphlet
		Geochemistry analyses (GeochemistryPoints)—See chemical analyses in table 3 at <a href="https://doi.org/10.3133/sim3443">https://doi.org/10.3133/sim3443</a>
		Boring lava age (BoringLavaAge)Points— <sup>40</sup> Ar/ <sup>39</sup> Ar ages from Fleck and others (2014)



**Figure 1.** Maps showing (A) locations and names for quadrangles and counties and (B) sources of geologic mapping in the greater Portland metropolitan area and surrounding region.

# Geologic Map of the Greater Portland Metropolitan Area and Surrounding Region, Oregon and Washington

By

Ray E. Wells,<sup>1</sup> Ralph A. Haugerud,<sup>1</sup> Alan R. Niem,<sup>2</sup> Wendy A. Niem,<sup>2</sup> Lina Ma,<sup>3</sup> Russell C. Evarts,<sup>1</sup>

James E. O'Connor,<sup>1</sup> Ian P. Madin,<sup>3</sup> David R. Sherrod,<sup>1</sup> Marvin H. Beeson,<sup>4</sup> Terry L. Tolan,<sup>5</sup>

Karen L. Wheeler,<sup>1</sup> William B. Hanson,<sup>6</sup> and Michael G. Sawlan<sup>1</sup>

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<sup>1</sup>U.S. Geological Survey<sup>3</sup>Oregon State University<sup>4</sup>Portland State University.

<sup>6</sup>Private consultant

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