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Michael H. Darin¹, Jason D. McClaughry², Carlie J.M. Azzopardi¹, Jon J. Franczyk¹, and Ian P. Madin¹

Cartography by Jon J. Franczyk¹ and Geodatabase by Carlie J.M. Azzopardi

¹ Oregon Department of Geology and Mineral Industries, 800 NE Oregon Street, Suite 965, Portland, OR 97232
² Oregon Department of Geology and Mineral Industries, Baker City Field Office, Baker County Courthouse, 1995 3rd Street, Suite 110, Baker City, OR 97811

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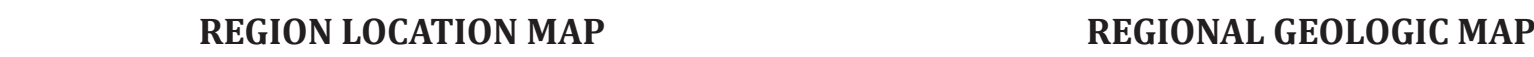
PLATE 4

This time-rock chart illustrates the absolute ages, relative stratigraphic relations, and correlations of significant bedrock geologic map units found at the surface and in the subsurface in the Cascades region of the state of Oregon. As defined here, the Cascades region includes the area bounded by the Columbia River on the north, U.S. Highway 97 on the east, the California state border on the south, the western edge of Cascades volcanic arc rocks on the southwest, and Interstate 5 on the west and northwest.

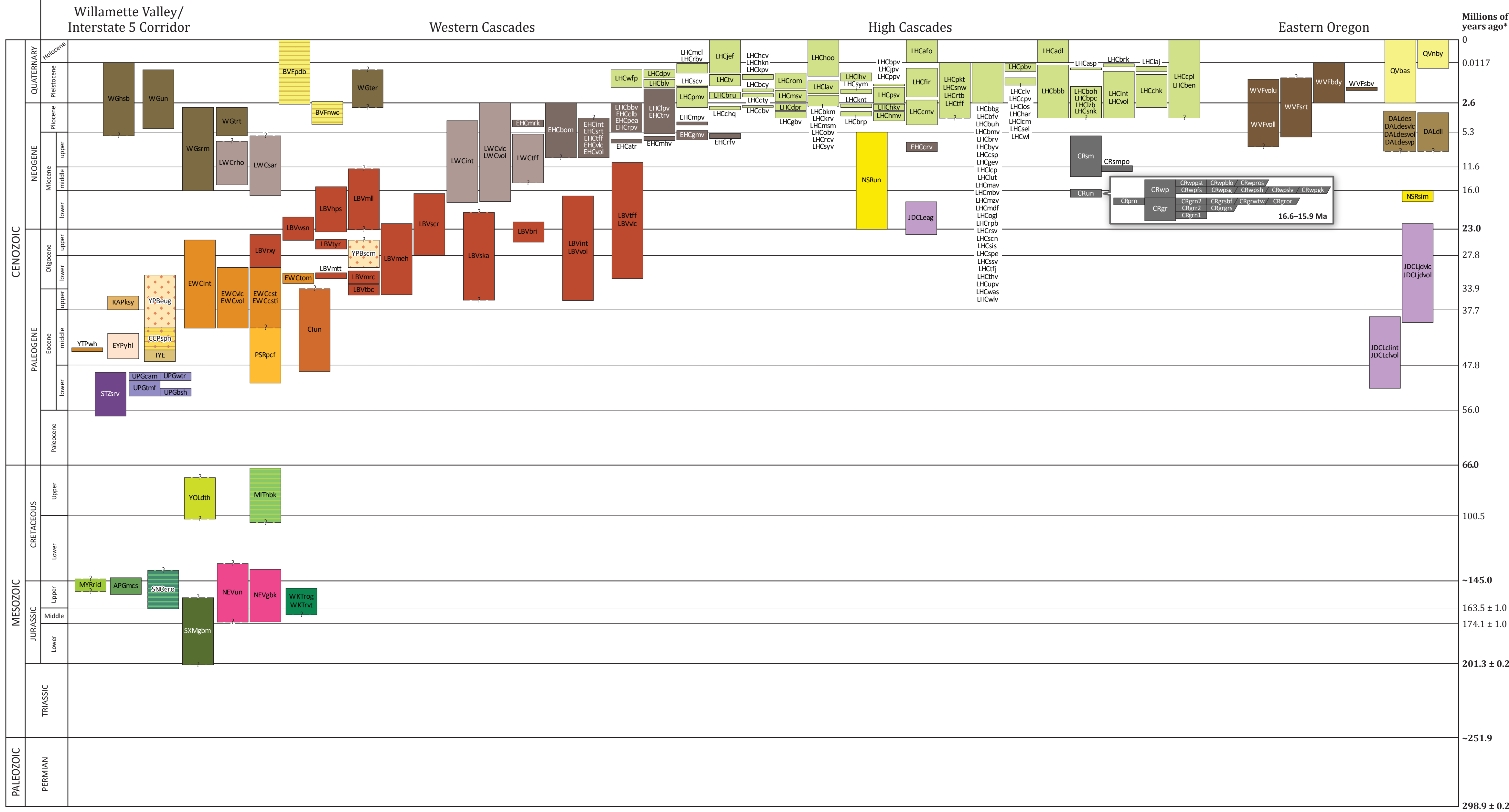
names of eruptive centers. Some informal names used here have wide currency and a form (geographic name combined with rank or descriptive term) reserved for formal names; their informal status is denoted by a lowercase rank or descriptive term followed by an asterisk, e.g., Ortleby member*.

In the legend, map units are arranged alphabetically by their Compilation Unit Label for ease of reference with the chart. Colors correspond with each unit's Terrane/Group. On the chart, map units are arranged vertically by their age of deposition or emplacement, and horizontally from west to east within the Cascades region; because many units extend laterally over significant portions of the region, their horizontal positions in the chart are relative approximations. Although spatial and lateral stratigraphic relations among units are not easily represented in this format, the main purpose of this chart is to illustrate the absolute age spans and temporal relations among various map units in the Oregon Cascade Range.

Geologic map units are derived from the statewide Oregon Geologic Data Compilation (OGDC-8) and include formally recognized geologic groups, formations, and members, as well as some informal rock units. Each unit in OGDC-8 is assigned a unique "Compilation Unit Name" and abbreviated "Compilation Unit Label" that combines its higher-order "Terrane/Group" classification (in uppercase letters) with its lower-order formation classification (in lowercase letters). The terms used here for Compilation Unit Name and Terrane/Group are a mixture of formal stratigraphic names, informal stratigraphic names, and—especially for many young volcanic units—geographic



Note that Quaternary surficial deposits shown in white are not included on the time-rock chart below



*International Chronostratigraphic Chart, International Stratigraphic Commission, v.2022/02, Time scale after Gradstein and others (2012) and Cohen and others (2013) <https://stratigraphy.org/ICSchart/ChronostratChart2022-02.pdf>

Cohen, K. M., Finney, S. C., Gibbard, P.L. and Fan, J.-X., 2013, The ICS International Chronostratigraphic Chart Episodes 36, p. 199-204.

Gradstein, F.M., Ogg, J.G., Schmitz, M.D., and Ogg, G.M., eds., 2012, *The Geologic Time Scale 2012*: Boston Elsevier, 1176 p.

(arranged alphabetically by Compilation Unit Label)			
Compilation Unit Label	Compilation Unit Name	Terrane/Group	Bedrock Areal Coverage in Region (%)
AGfncs	May Creek Schist	Applegate Group	< 0.1
BVfrwc	northwest Cascade volcanoes	Boring volcanic field	1.3
BVPdb	Portland Basin volcanoes		
CCspgr	Spencer Formation	Coaledo-Cowhig Zone	< 0.1
Clun	Coastal intrusions*, undifferentiated	Coastal intrusions*	< 0.1
Clgr	Grande Ronde Basalt	Columbia River Basalt Group	8.7
Clgrgrs	Grouse Creek member*		
Clgrn1	N1 subunit of Grande Ronde Basalt		
Clgrn2	N2 subunit of Grande Ronde Basalt		
Clgror	Odeby member*		
Clgrr2	R2 subunit of Grande Ronde Basalt		
Clgrbl	Sentinal Bluffs Member		
Clgrvw	Winter Water Member		
Clgrn	Prineville Basalt		
ClRm	Saddle Mountains Basalt		
CRmpo	Pomona Member		
Clun	Columbia River Basalt group, undivided		
Clwbp0	basalt of Lolo		
Clwbp1	Frenchman Springs Member		
Clwbp2	basalt of Ganko		
Clwbp3	Priest Rapids Member		
Clwbp4	Roxa Member		
Clwbp5	basalt of Rosalia		
Clwbp6	basalt of Sentinel Gap		
Clwbp7	basalt of Sand Hollow		
Clwbp8	basalt of Silver Falls		
DAlDes	Deschutes Formation	Dalles package	8.5
DAlDeswc	volcaniclastic rocks of Deschutes Formation		
DAlDeswl	volcanic rocks of Deschutes Formation		
DAlDeswp	vents of Deschutes Formation		
DAlDl	Dalles Formation		
EHcitr	andesite of Table Rock	early High Cascade Volcanics	6.3
EHcbbv	Bieberstadt Butte volcano		
EHc0om	volcanic rocks of Olkon Mountain		
EHc0cb	Close Butte volcano		
EHc0crv	Castle Rock volcano		
EHc0grv	Grizzly Mountain volcano		
EHc0int	intrusive rocks of early High Cascade Volcanics		
EHc0pv	Lung Prairie volcano		
EHc0hv	Mule Hill volcano		
EHc0prv	Moon Prairie volcano		
EHc0rk	basalt of Marks Ridge		
EHc0ea	Pearson Butte Volcano		
EHc0fv	Rye Flat volcano		
EHc0pv	Rustler Peak volcano		
EHc0rt	sedimentary rocks of early High Cascade Volcanics		
EHc0ff	tuffs of early High Cascade Volcanics		
EHc0rv	Toms Reservoir volcano		
EHc0k	volcaniclastic rocks of early High Cascade Volcanics		
EHc0el	lavas of early High Cascade Volcanics		
EWc0st	Colestin Formation	early Western Cascade Volcanics	2.7
EWc0stl	intrusive rocks of Colestin Formation		
EWc0tnt	intrusive rocks of early Western Cascade Volcanics		
EWc0tm	tuff of Mosser Mountain		
EWc0k	volcaniclastic rocks of early Western Cascade Volcanics		
EWc0el	lavas of early Western Cascade Volcanics		
EYp0hl	Yamhill Formation	Elkton-Yamhill package	< 0.1
JDC0clnt	intrusive rocks of Clarno Formation	John Day/ Clarno package	1.8
JDC0clwl	volcanic rocks of Clarno Formation		
JDC0eag	Eagle Creek Formation		
JDC0jdc	volcaniclastic rocks of John Day Formation		
JDC0jdel	volcanic rocks of John Day Formation		
KAPK5	Keasey Formation	Keasey-Alsea package	< 0.1
LHC0dl	Andesite of Davis Lake	late High Cascade Volcanics	27.7
LHC0fo	Andesite of Four-in-One		
LHC0sp	Aspen Butte volcano		
LHC0bb	Burton Butte volcano		
LHC0bg	Big Bunchgrass volcano		
LHC0cy	volcanic rocks of Blue Canyon Lake		
LHC0cs	tuffs of Reed		
LHC0fv	Baraface Butte volcano		
LHC0km	Buck Mountain volcano		
LHC0bh	volcanic rocks of Booth Hill		
LHC0lv	volcanic rocks of Buck Lake		

(arranged alphabetically by Compilation Unit Label)			
Compilation Unit Label	Compilation Unit Name	Terrane/Group	Bedrock Areal Coverage in Region (%)
UH00v	Brush Mountain volcano		
UH01h	Bunker Hill volcano		
UH02m	Brown Mountain volcano		
UH03pc	basalt of Post Canyon		
UH03pv	Buck Peak volcano		
UH03rk	Broken Top volcano		
UH03rp	basalt of Rattles Point		
UH03rv	volcanic rocks of Blue Ridge		
UH03yv	Mount Bailey volcano		
UH03zb	Cox Butte volcano		
UH03nk	volcanic rocks of Chicken Hills		
UH03cq	Chinquapiu Mountain volcano		
UH03cl	Clover Butte volcano		
UH03mw	Clase Mountain volcano		
UH03pl	lavas of Cascade platform		
UH03pv	Cherry Peak volcano		
UH03zp	Castle Point volcano		
UH03ty	County Line volcano		
UH03dr	Daley Prairie volcano		
UH03pv	Dewitt Peak volcano		
UH03fr	volcanic rocks of Fry Mountain		
UH03zb	Grouse Butte volcano		
UH03ev	Goose Egg volcano		
UH03ar	Mount Hurstman volcano		
UH03hc	Horse Creek volcano		
UH03hn	High Knoll volcano		
UH03lv	Hammer Mountain volcano		
UH03mw	Hayden Mountain volcano		
UH03ao	Mount Hood volcano		
UH03it	intrusive rocks of late High Cascade Volcanics		
UH03ef	Mount Jefferson volcano		
UH03pv	Johnson Prairie volcano		
UH03nt	Kent Peak volcano		
UH03pv	Klamath Point volcano		
UH03rv	Keno Road volcano		
UH03aj	volcanic rocks of Lajeunesse Creek		
UH03av	Latter Mountain volcano		
UH03cm	Little Chinquapiu Mountain volcano		
UH03cp	Last Creek Cinder Pile volcano		
UH03hv	volcanic rocks of Lane Hill		
UH03os	Lost Peak volcano		
UH03ut	Luther Peak volcano		
UH03zb	Lenz Butte Volcanics		
UH03av	Mauke Mountain volcano		
UH03rb	Mount Bachelor volcanic chain		
UH03el	Mount McLaughlin volcano		
UH03rf	Mount Defiance volcano		
UH03rm	Mud Spring Mountain volcano		
UH03rv	Muddy Spring volcano		
UH03ev	Mazama volcano		
UH03bv	Old Baldy volcano		
UH03gl	Lahar of Oak Grove		
UH03bv	Pelican Butte volcano		
UH03kt	sedimentary rocks of Parkette Creek		
UH03pm	Parker Mountain volcano		
UH03pv	Pearce Point volcano		
UH03pv	Penny Spring volcano		
UH03bv	Rahmston Butte volcano		
UH03cy	Rainbow Creek volcano		
UH03cm	Roma Hill volcano		
UH03rb	Pothole Butte volcano		
UH03rv	Rye Spur volcano		
UH03dr	Rocketp Butte volcano		
UH03en	Scoria Cove volcano		
UH03ev	Spencer Creek volcano		
UH03el	Seldom Creek volcano		
UH03is	Sisters Volcanic Center		
UH03nk	basalt of Snakehead Creek		
UH03mw	Snow Peak volcano		
UH03pe	Spence Mountain volcano		
UH03bv	Stowdese Butte volcano		
UH03ym	Surveyor Mountain volcano		
UH03rv	Sheepy Creek volcano		
UH03ff	tuffs of late High Cascade Volcanics		
UH03ti	Three Fingered Jack volcano		
UH03bv	Mount Thiesen volcano		
UH03rv	volcanic rocks of Tomahawk ski area		
UH03ev	Union Peak volcano		
UH03el	lavas of late High Cascade Volcanics		
UH03as	Mount Washington volcano		
UH03wp	volcanic rocks of Whitetface Peak		
UH03al	volcanic rocks of Woodpecker Lake		
UH03wv	Whitum Lake volcano		
		late High Cascade Volcanics	27.7

(arranged alphabetically by Compilation Unit Label)			
Compilation Unit Label	Compilation Unit Name	Terrane/Group	Bedrock Areal Coverage In Region (%)
LWGnt	intrusive rocks of late Western Cascade Volcanics	late Western Cascade Volcanics	10.7
LWCho	Rhododendron Formation		
LWCar	Sardine Formation		
LWCrf	tuffs of late Western Cascade Volcanics		
LWCoc	volcaniclastic rocks of late Western Cascade Volcanics		
LWCol	lavas of late Western Cascade Volcanics		
LBVbr	Breitenbush Tuff	Little Butte Volcanics	27.2
LBVhps	Heppies Formation		
LBVnt	intrusive rocks of Little Butte Volcanics		
LBVneh	Neahua Formation		
LBVnl	Mallala Formation		
LBVnc	Melchuk River caldera		
LBVntt	basalt of Mount Tom		
LBVay	Roxy Formation		
LBVcr	volcanic rocks of Scorpion Mountain		
LBVka	Skaramia Volcanics		
LBVbc	tuff of Bond Creek		
LBVff	tuffs of Little Butte Volcanics		
LBVyr	tuff of Yellow Rocks		
LBVdc	volcaniclastic rocks of Little Butte Volcanics		
LBVlo	lavas of Little Butte Volcanics		
LBVwn	Wasson Formation		
MTbbk	Hornbrook Formation	Mitchell package	< 0.1
MYrid	Riddle Formation	Myrtle Group	< 0.1
NSRim	Sinistatus Formation	Neogene sedimentary rocks	0.9
NSRn	Neogene sedimentary rocks, undifferentiated		
NEVap	Grayback plutons	Nevadan intrusions	< 0.1
NEVun	Nevadan intrusions, undifferentiated		
PSRcf	Payne Cliffs Formation	Paleogene sedimentary rocks	< 0.1
QVbas	Quaternary basalt	Quaternary volcanics	0.5
QVnbv	Newberry Volcano		
SOMgm	Greenback melange*	Sexton Mountain terrane	< 0.1
STZrv	Siletz River Volcanics	Siletz terrane	< 0.1
SNcto	Shawnee Conglomerate	Shawnee terrane	0.88
TYE	Tyre Formation	Tyre package	< 0.1
UPGsh	Bushnell Rock Formation	Umpqua Group	< 0.1
UPGcam	Camas Valley Formation		
UPGmf	Terminle Formation		
UPGwr	White Tail Ridge Formation		
WKTrog	Rogue Formation	western Klamath terrane	< 0.1
WKTnr	Rogue Valley subterrane, undivided		
WGhdb	Hillboro Formation	Willamette package	1.6
WGorm	Sandy River Mudstone		
WGrtr	terrace deposits of Willamette package		
WGrt	Trousdale Formation		
WGu	Willamette package, undivided		
WVFbd	Boundary Butte volcano	Winema volcanic field	1.5
WVFsb	Soloman Butte volcano		
WVFst	sedimentary rocks of Winema Volcanic Field		
WVFlo	lower volcanic rocks of Winema volcanic field		
WVFlo	upper volcanic rocks of Winema volcanic field		
YPBgc	Yugene Formation	Yaquina-Pittsburg Bluff package	0.4
YPScm	Scotts Mills Formation		
YTPh	basalt of Waverly Heights	Yachats-Thillbrook package	< 0.1
YOLth	Dothan Formation	Yolla Bolly terrane	< 0.1



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