STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
RUARRI J. DAY-STIRRAT, STATE GEOLOGIST
https://www.oregon.gov/dogami/

Time-Rock Chart and Correlation of Map Units for the Oregon Cascade Range

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DOGAMI Digital Data Series

Oregon Geologic Data Compilation, Release 8 (OGDC-8)

Michael H. Darin[1], Jason D. McClaughry[1,2], Carlie J.M. Azzopardi[1], Jon J. Franczyk[1], and Ian P. Madin[1]

Cartography by Jon J. Franczyk[1] and Geodatabase by Carlie J.M. Azzopardi[1]

[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 130, Baker City, OR 97814

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PLATE 4

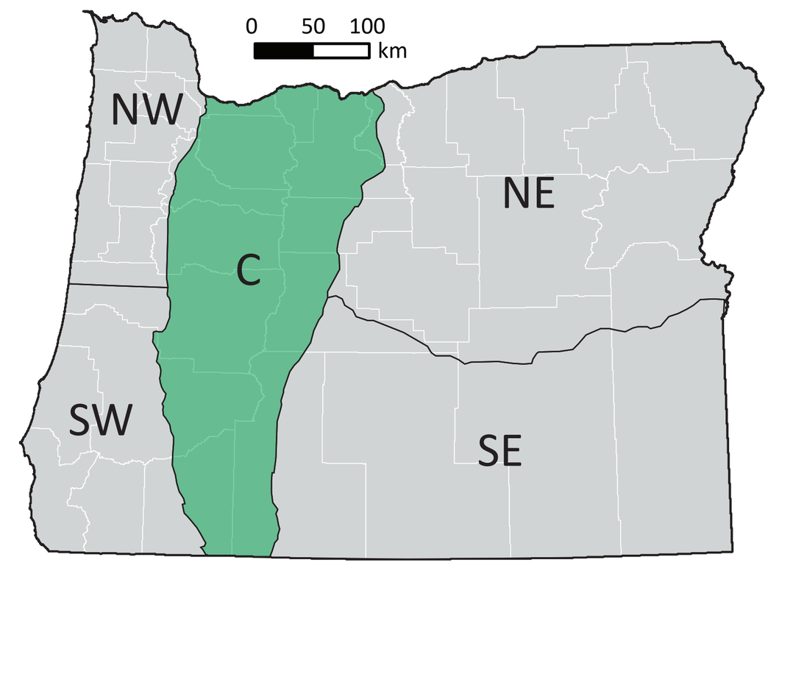
INTRODUCTION

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.

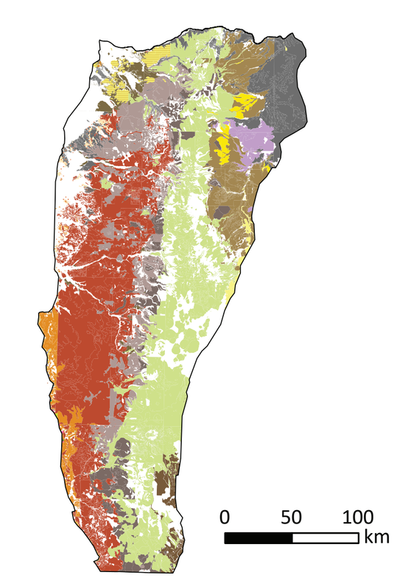
Geologic map units are derived from the statewide Oregon Geologic Data Compilation (OGDC-8) and include formally recognized geologic groups, formations, and members, as well as some informal rock units. Each unit in OGDC-8 is assigned a unique "Compilation Unit Name" and abbreviated "Compilation Unit 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 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., Ortley 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.

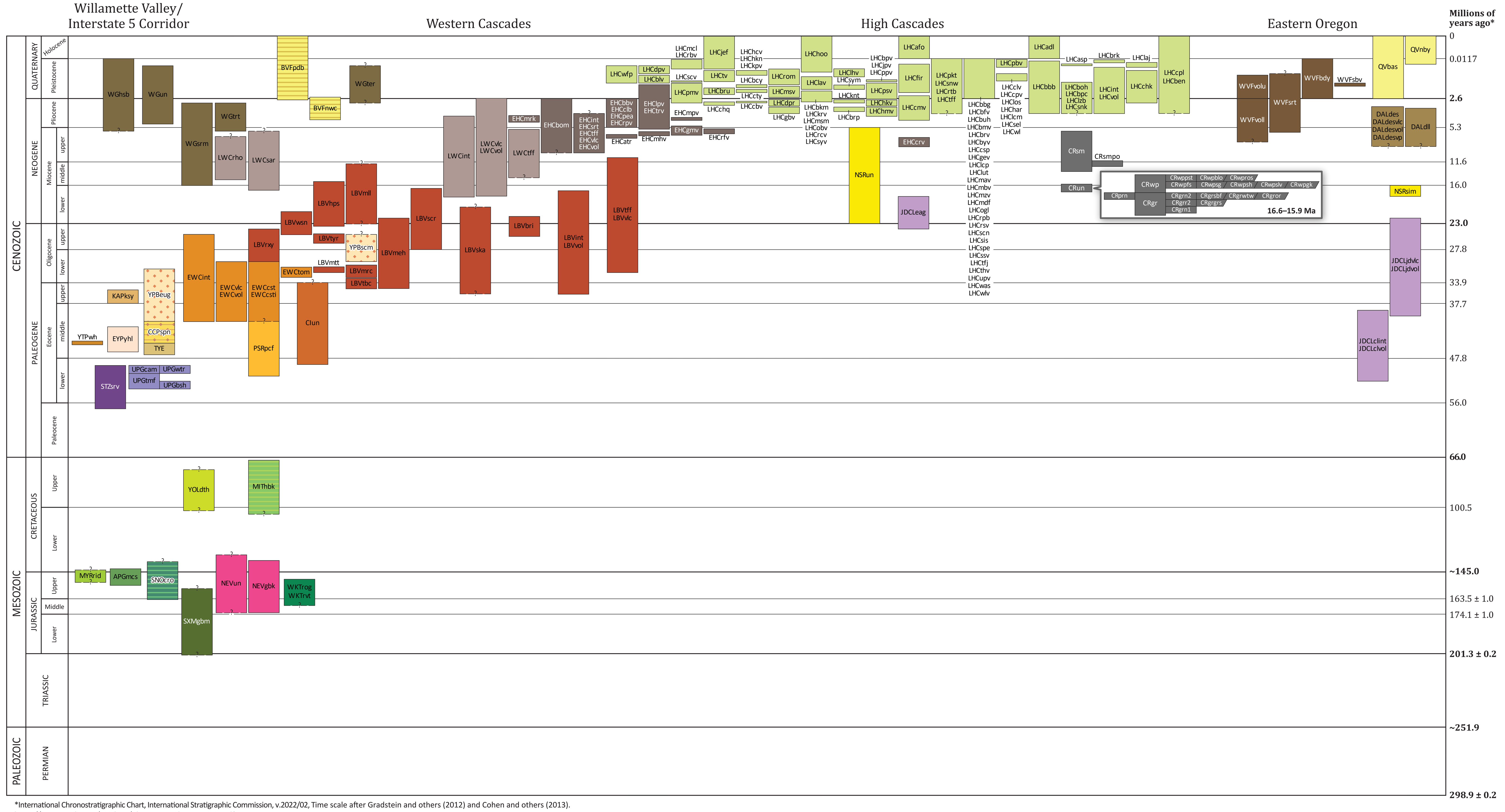
REGION LOCATION MAP



REGIONAL GEOLOGIC MAP



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

(arranged alphabetically by Compilation Unit Label)

Compilation Unit Label	Compilation Unit Name	Terrane/Group	Bedrock Areal Coverage in Region (%)
APGmcs	May Creek Schist	Applegate Group	< 0.1
BVFnwc	northwest Cascade volcanoes	Boring volcanic field	1.3
BVFpdb	Portland Basin volcanoes		
CCPspn	Spencer Formation	Coaledo-Cowlitz package	< 0.1
CIun	Coastal intrusions*, undifferentiated	Coastal intrusions*	< 0.1
CRgr	Grande Ronde Basalt	Columbia River Basalt Group	8.7
CRgrgrs	Grouse Creek member*		
CRgrn1	N1 subunit of Grande Ronde Basalt		
CRgrn2	N2 subunit of Grande Ronde Basalt		
CRgror	Ortley member*		
CRgrr2	R2 subunit of Grande Ronde Basalt		
CRgrsbf	Sentinel Bluffs Member		
CRgrwtw	Winter Water Member		
CRprn	Prineville Basalt		
CRsm	Saddle Mountains Basalt		
CRsmpo	Pomona Member		
CRun	Columbia River Basalt Group, undivided		
CRwpblo	basalt of Lolo		
CRwpfs	Frenchman Springs Member		
CRwpgk	basalt of Ginkgo		
CRwppst	Priest Rapids Member		
CRwpr	Roza Member		
CRwpros	basalt of Rosalia		
CRwpsg	basalt of Sentinel Gap		
CRwpsh	basalt of Sand Hollow		
CRwpslv	basalt of Silver Falls		
DALdes	Deschutes Formation	Dalles package	8.5
DALdesvlc	volcaniclastic rocks of Deschutes Formation		
DALdesvol	volcanic rocks of Deschutes Formation		
DALdesvp	vents of Deschutes Formation		
DALdll	Dalles Formation		
EHCatr	andesite of Table Rock	early High Cascade Volcanics	6.3
EHCbbv	Bieberstadt Butte volcano		
EHCbom	volcanic rocks of Olson Mountain		
EHCclb	Close Butte volcano		
EHCcrv	Castle Rock volcano		
EHCgmv	Grizzly Mountain volcano		
EHCint	intrusive rocks of early High Cascade Volcanics		
EHClpv	Long Prairie volcano		
EHCmhv	Mule Hill volcano		
EHCmpv	Moon Prairie volcano		
EHCmrk	basalt of Marks Ridge		
EHCpea	Pearson Butte Volcano		
EHCrfv	Rye Flat volcano		
EHCrpv	Rustler Peak volcano		
EHCsrt	sedimentary rocks of early High Cascade Volcanics		
EHCtff	tuffs of early High Cascade Volcanics		
EHCtrv	Toms Reservoir volcano		
EHCvlc	volcaniclastic rocks of early High Cascade Volanics		
EHCvol	lavas of early High Cascade Volcanics		
EWCcst	Colestin Formation	early Western Cascade Volcanics	2.7
EWCcsti	intrusive rocks of Colestin Formation		
EWCint	intrusive rocks of early Western Cascade Volcanics		
EWCtom	tuff of Mosser Mountain		
EWCvlc	volcaniclastic rocks of early Western Cascade Volcanics		
EWCvol	lavas of early Western Cascade Volcanics		
EYPyhl	Yamhill Formation	Elkton-Yamhill package	< 0.1
JDCLclint	intrusive rocks of Clarno Formation	John Day/ Clarno package	1.8
JDCLclvol	volcanic rocks of Clarno Formation		
JDCLeag	Eagle Creek Formation		
JDCLjdvlc	volcaniclastic rocks of John Day Formation		
JDCLjdvol	volcanic rocks of John Day Formation		
KAPksy	Keasey Formation	Keasey-Alsea package	< 0.1
LHCadl	Andesite of Davis Lake	late High Cascade Volcanics	27.7
LHCafo	Andesite of Four-in-One		
LHCasp	Aspen Butte volcano		
LHCbbb	Burton Butte volcano		
LHCbbg	Big Bunchgrass volcano		
LHCbcy	volcanic rocks of Blue Canyon Lake		
LHCben	tuffs of Bend		
LHCbfv	Bareface Butte volcano		
LHCbkm	Buck Mountain volcano		
LHCboh	volcanic rocks of Booth Hill		
LHCblv	volcanic rocks of Buck Lake		

(arranged alphabetically by Compilation Unit Label)

Compilation Unit Label	Compilation Unit Name	Terrane/Group	Bedrock Areal Coverage in Region (%)
LHCbru	Brush Mountain volcano	late High Cascade Volcanics	27.7
LHCbuh	Bunker Hill volcano		
LHCbmv	Brown Mountain volcano		
LHCbpc	basalt of Post Canyon		
LHCbpv	Buck Peak volcano		
LHCbrk	Broken Top volcano		
LHCbrp	basalt of Ruthton Point		
LHCbrv	volcanic rocks of Blue Ridge		
LHCbyv	Mount Bailey volcano		
LHCcbv	Cox Butte volcano		
LHCchk	volcanic rocks of Chicken Hills		
LHCchq	Chinquapin Mountain volcano		
LHCclv	Clover Butte volcano		
LHCcmv	Chase Mountain volcano		
LHCcpl	lavas of Cascade platform		
LHCcpv	Cherry Peak volcano		
LHCcsp	Castle Point volcano		
LHCcty	County Line volcano		
LHCdpr	Daley Prairie volcano		
LHCdpv	Devils Peak volcano		
LHCfir	volcanic rocks of Fir Mountain		
LHCgbv	Grouse Butte volcano		
LHCgev	Goose Egg volcano		
LHChar	Mount Harriman volcano		
LHChcv	Horse Creek volcano		
LHChkn	High Knob volcano		
LHChkv	Hamaker Mountain volcano		
LHChmv	Hayden Mountain volcano		
LHChoo	Mount Hood volcano		
LHCint	intrusive rocks of late High Cascade Volcanics		
LHCjef	Mount Jefferson volcano		
LHCjpv	Johnson Prairie volcano		
LHCknt	Kent Peak volcano		
LHCkpv	Klamath Point volcano		
LHCkrv	Keno Road volcano		
LHClaj	volcanic rocks of Lajeunesse Creek		
LHClav	Lather Mountain volcano		
LHClcm	Little Chinquapin Mountain volcano		
LHClcp	Lost Creek Cinder Pit volcano		
LHClhv	volcanic rocks of Lone Hill		
LHClos	Lost Peak volcano		
LHClut	Luther Peak volcano		
LHClzb	Lenz Butte Volcanics		
LHCmav	Maude Mountain volcano		
LHCmbv	Mount Bachelor volcanic chain		
LHCmcl	Mount McLoughlin volcano		
LHCmdf	Mount Defiance volcano		
LHCmsm	Mud Spring Mountain volcano		
LHCmsv	Muddy Spring volcano		
LHCmzv	Mazama volcano		
LHCobv	Old Baldy volcano		
LHCogl	lahar of Oak Grove		
LHCpbv	Pelican Butte volcano		
LHCpkt	sedimentary rocks of Parkette Creek		
LHCpmv	Parker Mountain volcano		
LHCppv	Pearce Point volcano		
LHCpsv	Penny Spring volcano		
LHCrbv	Robinson Butte volcano		
LHCrcv	Rainbow Creek volcano		
LHCrom	Roma Hill volcano		
LHCrpb	Pothole Butte volcano		
LHCrsv	Rye Spur volcano		
LHCrtb	Rocktop Butte volcano		
LHCscn	Scoria Cone volcano		
LHCscv	Spencer Creek volcano		
LHCsel	Seldom Creek volcano		
LHCsis	Sisters Volcanic Center		
LHCsnk	basalt of Snakehead Creek		
LHCsnw	Snow Peak volcano		
LHCspe	Spence Mountain volcano		
LHCssv	Snowshoe Butte volcano		
LHCsym	Surveyor Mountain volcano		
LHCsyv	Sheepy Creek volcano		
LHCtff	tuffs of late High Cascade Volcanics		
LHCtfj	Three Fingered Jack volcano		
LHCthv	Mount Thielsen volcano		
LHCtv	volcanic rocks of Tomahawk ski area		
LHCupv	Union Peak volcano		
LHCvol	lavas of late High Cascade Volcanics		
LHCwas	Mount Washington volcano		
LHCwfp	volcanic rocks of Whiteface Peak		
LHCwl	volcanic rocks of Woodpecker Lake		
LHCwlv	Wahtum Lake volcano		

(arranged alphabetically by Compilation Unit Label)

Compilation Unit Label	Compilation Unit Name	Terrane/Group	Bedrock Areal Coverage in Region (%)
LWCint	intrusive rocks of late Western Cascade Volcanics	late Western Cascade Volcanics	10.7
LWCrho	Rhododendron Formation		
LWCsar	Sardine Formation		
LWCtff	tuffs of late Western Cascade Volcanics		
LWCvlc	volcaniclastic rocks of late Western Cascade Volcanics		
LWCvol	lavas of late Western Cascade Volcanics		
LBVbri	Breitenbush Tuff	Little Butte Volcanics	27.2
LBVhps	Heppsie Formation		
LBVint	intrusive rocks of Little Butte Volcanics		
LBVmeh	Mehama Formation		
LBVmll	Mollala Formation		
LBVmrc	Mohawk River caldera		
LBVmtt	basalt of Mount Tom		
LBVrxy	Roxy Formation		
LBVscr	volcanic rocks of Scorpion Mountain		
LBVska	Skamania Volcanics		
LBVtbc	tuff of Bond Creek		
LBVtff	tuffs of Little Butte Volcanics		
LBVtyr	tuff of Yellow Rocks		
LBVvlc	volcaniclastic rocks of Little Butte Volcanics		
LBVvol	lavas of Little Butte Volcanics		
LBVwsn	Wasson Formation		
MIThbk	Hornbrook Formation	Mitchell package	< 0.1
MYRrid	Riddle Formation	Myrtle Group	< 0.1
NSRsim	Simtustus Formation	Neogene sedimentary rocks	0.9
NSRun	Neogene sedimentary rocks, undifferentiated		
NEVgbk	Grayback plutons	Nevadan intrusions	< 0.1
NEVun	Nevadan intrusions, undifferentiated		
PSRpcf	Payne Cliffs Formation	Paleogene sedimentary rocks	< 0.1
QVbas	Quaternary basalt	Quaternary volcanics	0.5
QVnby	Newberry Volcano		
SXMgbm	Greenback melange*	Sexton Mountain terrane	< 0.1
STZsrv	Siletz River Volcanics	Siletz terrane	< 0.1
SNOcro	Coast Range ophiolite*	Snow Camp terrane	< 0.1
TYE	Tyee Formation	Tyee package	< 0.1
UPGbsh	Bushnell Rock Formation	Umpqua Group	< 0.1
UPGcam	Camas Valley Formation		
UPGtmf	Tenmile Formation		
UPGwtr	White Tail Ridge Formation		
WKTrog	Rogue Formation	western Klamath terrane	< 0.1
WKTrvt	Rogue Valley subterrane, undivided		
WGhsb	Hillsboro Formation	Willamette package	1.6
WGsrm	Sandy River Mudstone		
WGter	terrace deposits of Willamette package		
WGtrt	Troutdale Formation		
WGun	Willamette package, undivided		
WVFbdy	Boundary Butte volcano	Winema volcanic field	1.5
WVFsbv	Soloman Butte volcano		
WVFsrt	sedimentary rocks of Winema Volcanic Field		
WVFvoll	lower volcanic rocks of Winema volcanic field		
WVFvolu	upper volcanic rocks of Winema volcanic field		
YPBeug	Eugene Formation	Yaquina-Pittsburg Bluff package	0.4
YPBscm	Scotts Mills Formation		
YTPwh	basalt of Waverly Heights	Yachats-Tillamook package	< 0.1
YOLdth	Dothan Formation	Yolla Bolly terrane	< 0.1

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REFERENCES

Cohen, K. M., Finney, S. C., Gibbard, P.L. and Fan, J.-X, 2013, The ICS International Conostratigraphic 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.