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 Southeast Oregon

2025

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

Data synthesis and updates to the Oregon Geologic Data Compilation were supported in part by a grant from U.S. Geological Survey (USGS) through the U.S. GeoFramework Initiative component of the National Cooperative Geologic Mapping Program (NCGMP) under cooperative agreement G20AC00419. Additional funds were provided by the State of Oregon through the Oregon Department of Geology and Mineral Industries (DOGAMI).

PLATE 6

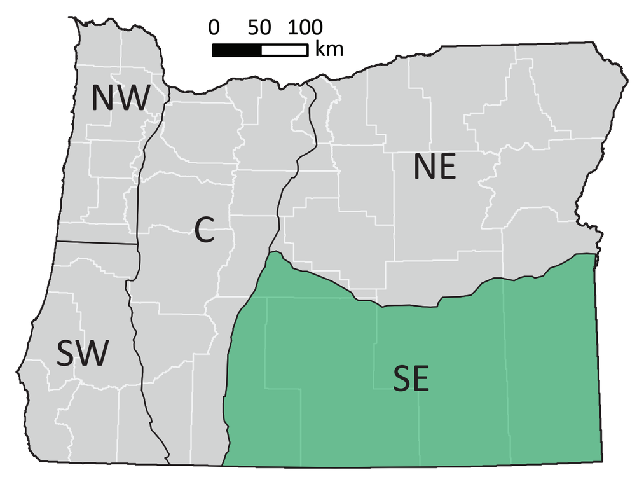
INTRODUCTION

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 Southeast region of the state of Oregon. As defined here, the Southeast region includes the area bounded by U.S. Highway 20 on the north, the Idaho state border on the east, the Nevada state border on the southeast, the California state border on the southwest, and U.S. Highway 97 on the west.

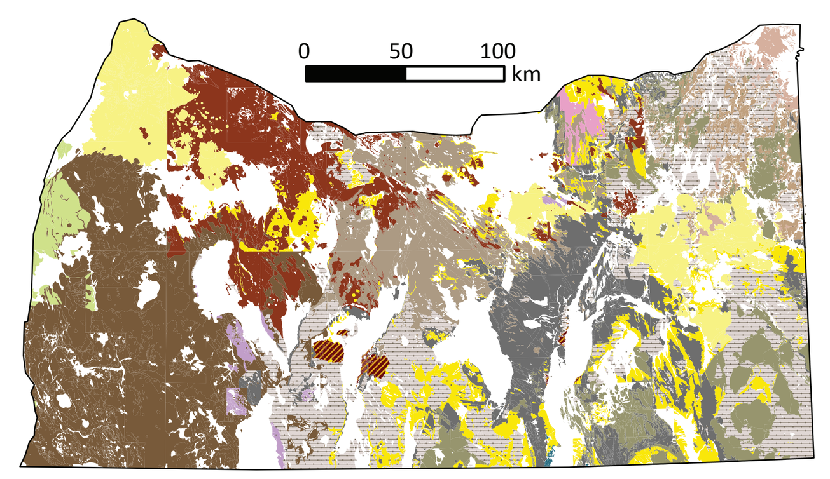
Geologic map units are derived from the statewide Oregon Geologic Data Compilation (OGDC-8) and include formally recognized geologic groups, formations, and members, as well as some informal rock units. Each unit in OGDC-8 is assigned a unique "Compilation Unit Name" and abbreviated "Compilation Unit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

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 Southeast 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 Southeast region.

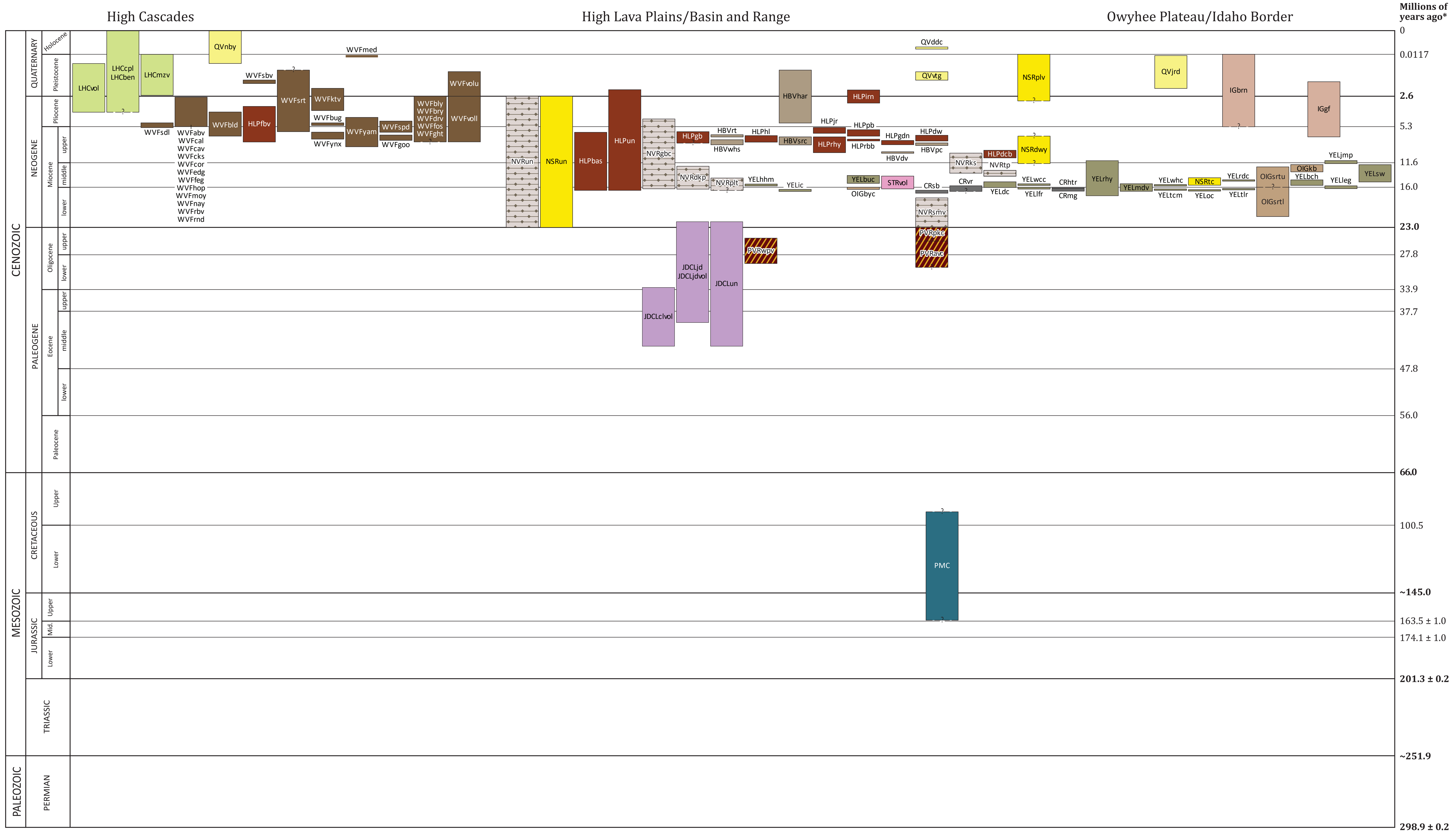
REGION LOCATION MAP



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 (%)
CRhtr	Hunter Creek Basalt	Columbia River Basalt Group	11.9
CRmg	basalt of Malheur Gorge		
CRsb	Steens Basalt		
CRvr	basalt of Venator Ranch		
HBVdv	Devine Canyon Ashflow Tuff	Harney Basin volcanic field	8.4
HBVhar	Harney Formation		
HBVpc	Prater Creek Ashflow Tuff		
HBVrt	Rattlesnake Ashflow Tuff		
HBVsrc	Silvies River caldera		
HBVwhs	tuff of Wheeler Springs		
HLPbas	basalt of High Lava Plains volcanic province	High Lava Plains volcanic province	10.4
HLPdcb	Duck Creek Butte eruptive center		
HLPdw	Drinkwater Basalt		
HLPfbv	Frederick Butte volcanic center		
HLPgb	olivine basalt of Gum Boot Canyon		
HLPgdn	soda rhyolite of Golden Ranch		
HLPhl	basalt of Harney Lake		
HLPirn	rhyolite of Iron Mountain		
HLPjr	volcanic rocks of Juniper Ridge		
HLPpb	rhyolite of Palomino Butte		
HLPrbb	rhyodacite of Burns Butte		
HLPrhy	rhyolite of High Lava Plains volcanic province		
HLPun	High Lava Plains volcanic province, undifferentiated		
IGbrn	Bruneau Formation	Idaho Group	0.9
IGgf	Glenns Ferry Formation		
JDCLclvol	volcanic rocks of Clarno Formation	John Day/ Clarno package	0.7
JDCLjd	John Day Formation		
JDCLjdvol	volcanic rocks of John Day Formation		
JDCLun	John Day-Clarno package, undivided		
LHCben	tuffs of Bend	late High Cascade Volcanics	1.6
LHCcpl	lavas of Cascade platform		
LHCmzv	Mazama volcano		
LHCvol	lavas of late High Cascade Volcanics		
NSRdwy	Drewsey Formation	Neogene sedimentary rocks	8.2
NSRplv	pluvial lake valley deposits		
NSRtc	Trout Creek formation*		
NSRun	Neogene sedimentary rocks, undifferentiated		
NVRdkp	rhyolite of Drake Peak	Neogene volcanic rocks	16.0
NVRgbc	volcanic complex of Glass Buttes		
NVRks	Keeney sequence		
NVRplt	Plush Tuff		
NVRsmv	Steens Mountain Volcanics		
NVRtp	Tims Peak Basalt		
NVRun	Neogene volcanic rocks, undifferentiated		
OIGbyc	Bully Creek Formation	Oregon-Idaho graben	2.3
OIGkb	tuff of Kern Basin		
OIGsrtl	lower sedimentary rocks of Oregon-Idaho graben		
OIGsrtu	upper sedimentary rocks of Oregon-Idaho graben		
PVRpkc	Pike Creek Formation	Paleogene volcanic rocks	0.5
PVRwpv	volcanic rocks of Warner Peak		
PVRavc	Alvord Creek Formation		

(arranged alphabetically by Compilation Unit Label)

Compilation Unit Label	Compilation Unit Name	Terrane/Group	Bedrock Areal Coverage in Region (%)
PMC	Pueblo Mountain metamorphic complex*	Pueblo Mountain metamorphic complex*	< 0.1
QVddc	volcanic rocks of Diamond Craters	Quaternary volcanics	9.6
QVjrd	volcanic rocks of Jordan Craters		
QVnby	Newberry Volcano		
QVvtg	basalt of Voltage		
STRvol	Strawberry Volcanics, undifferentiated	Strawberry Volcanics	0.6
WVFabv	volcanic rocks of Applegate Butte	Winema volcanic field	21.4
WVFbld	Bald Mountain volcanic center		
WVFbly	Bly Mountain volcano		
WVFbry	Bryant Mountain Volcanics		
WVFbug	Bug Butte Volcanics		
WVFcal	Calimus Butte volcano		
WVFcav	Cave Mountain volcano		
WVFcks	volcanic rocks of Cooks Mountain		
WVFcor	Corbell Butte volcano		
WVFdrv	Deadhorse Rim volcano		
WVFedg	Edgewood Mountain volcano		
WVFfeg	Fuego Mountain volcano		
WVFfos	Foster Butte volcano		
WVFght	Gearhart Mountain volcano		
WVFgoo	Goodlow Mountain volcano		
WVFhop	Hopper Hill volcano		
WVFktv	volcanic rocks of Knot Tableland		
WVFmed	Medicine Mountain volcano		
WVFmoy	Moyina Hill volcano		
WVFnay	Naylox Mountain volcano		
WVFrbv	Riverbed Butte volcano		
WVFrnd	Round Mountain volcano		
WVFsbv	Soloman Butte volcano		
WVFsdl	Saddle Mountain volcano		
WVFspd	Spodue Mountain volcano		
WVFsrt	sedimentary rocks of Winema volcanic field		
WVFvoll	lower volcanic rocks of Winema volcanic field		
WVFvolu	upper volcanic rocks of Winema volcanic field		
WVFyam	Yamsey Mountain volcano		
WVFynx	Yainax Butte volcano		
YELbch	tuff of Birch Creek	silicic rocks of Yellowstone hotspot	7.6
YELbuc	Buchanan ashflow tuff*		
YELdc	Dinner Creek Ashflow Tuff		
YELhhm	lavas of Horsehead Mountain		
YELic	Idaho Canyon Tuff		
YELjmp	Jump Creek Rhyolite		
YELleg	Leslie Gulch Ashflow Tuff		
YELlfr	Littlefield Rhyolite		
YELmdv	McDermitt volcanic field		
YELoc	tuff of Oregon Canyon		
YELrdc	rhyolite of Dry Creek		
YELrhy	rhyolite of Yellowstone hotspot		
YELtcm	tuff of Trout Creek Mountains		
YELsw	Swisher Mountain Tuff		
YELtlr	tuff of Long Ridge		
YELwcc	Wildcat Creek Welded Tuff		
YELwhc	tuff of Whitehorse Creek		
YELsw	Swisher Mountain Tuff		

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.

REGISTERED OREGON Michael Darin G2927 GEOLOGIST
Expires: 04/30/2026