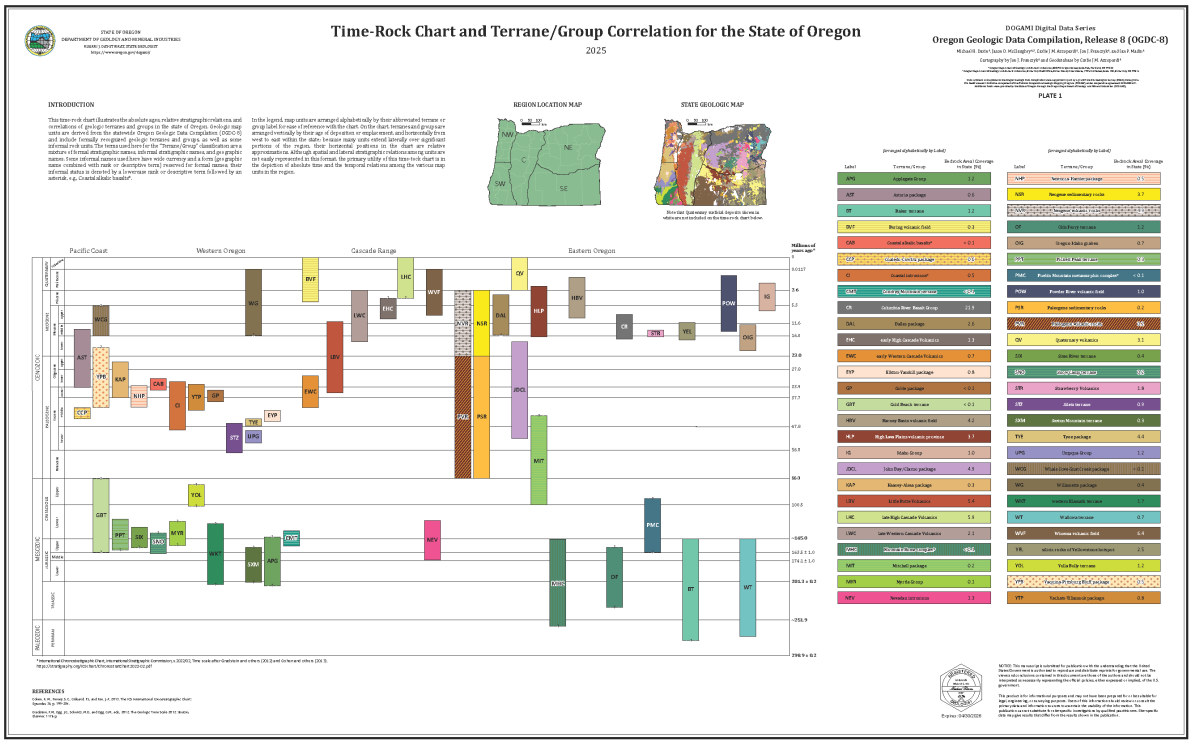
State of Oregon
Oregon Department of Geology and Mineral Industries
Ruarri J. Day-Stirrat, State Geologist

DIGITAL DATA SERIES OGDC-8

OREGON GEOLOGIC DATA COMPILATION, RELEASE 8 (OGDC-8)

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



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[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 9781

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WHAT'S IN THIS PUBLICATION?

The Oregon Geologic Data Compilation, Release 8 (OGDC-8) consists of a single consistent and maintainable geodatabase containing the most up-to-date geologic mapping data for the state. A series of six accompanying plates includes time-rock charts that show the ages and stratigraphic correlations among the hundreds of geologic map units at the Terrane/Group-level for the entire state and the Formation-level in five distinct regions.

Cover image: Example of Plate 1, Time-Rock Chart and Terrane/Group Correlation for the State of Oregon.

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For additional information:
Administrative Offices
800 NE Oregon Street, Suite 965
Portland, OR 97232
Telephone (971) 673-1555
https://oregon.gov/DOGAMI/

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GEOGRAPHIC INFORMATION SYSTEM (GIS) DATA

See the digital publication folder for files.
Geodatabase is ESRI® version 10.7 format. Metadata are embedded in the geodatabase and is also provided as separate .xml format files.

OGDC8.gdb:

Feature dataset: GeologicMap

feature classes:

CartographicLines (polylines)
ContactsAndFaults (polylines)
DataSourcePolys (polygons)
GeochemPoints (points)
GeochronPoints (points)
GeologicLines (polylines)
*MapUnitPolys (*polygons)
OrientationPoints (points)

Tabular data:

DataSources
DescriptionOfMapUnits
GeoMaterialDict
Glossary

1.0 Introduction

1.1 Project overview

The goal of the project described in this report is to add a layer of interpreted attributes to the Oregon Geologic Data Compilation (OGDC) to make the compilation more useful for regional and statewide geologic analysis. We assign each unit in OGDC to a new set of map unit names, or "Compilation Units," to make it easier to generate seamless maps. We also provide graphic time-rock charts that illustrate how these newly assigned Compilation Units correlate in time and space across the state.

1.1.1 History, structure, and content of OGDC

OGDC is the result of a multiyear compilation project conducted by the Oregon Department of Geology and Mineral Industries (DOGAMI) with funding support from the U.S. Geological Survey's (USGS) STATEMAP program. The goal was to assemble a complete digital geologic map of Oregon using a standardized method and data structure.

OGDC is fundamentally different from a traditional regional geologic map compilation. With a traditional approach, the available mapping and data are synthesized into a new set of consistent units with newly drawn seamless **map unit polygons (MUP)**. This approach is useful for regional analysis, but details of the original data are lost, and the units and unit polygons reflect the bias of the compiler. In addition, Oregon is still somewhat of a frontier state in terms of geologic mapping, with large areas covered by mapping that is decades old and/or of small scale (1:250,000 or less). A traditional compilation map would have required generalizing much of the geology to conform with the areas of low spatial and geologic resolution, thereby losing detail in areas with better mapping. To make OGDC, existing maps covering the entire state were digitized and mosaicked together, retaining their original scale, map unit names, and polygons. To approximate a seamless compilation map, regional experts added interpretive attributes to the MUP that could be used to make thematic maps that unified units across map boundaries. The primary product is a polygon map unit file, attributed with the identity of the source map, the original name and map symbol, and the interpreted thematic attributes. In addition, a geologic database (Ferns and others, 2006) was populated with detailed information (e.g., color, texture, mineralogy, structure) for each unit, drawn verbatim from each original map unit description. A parallel lithologic database was also developed to provide information about the engineering properties of each map unit. The purpose of these databases is to preserve as much original information from the map unit descriptions in a form that is searchable but not standardized.

The initial compilation was completed in five stages (Jenks and others, 2005, 2006a, 2006b, 2006c, 2007, 2008; Ferns and others, 2006; Niewendorp and others, 2007; Wells and others, 2008; Ma and others, 2009) with each stage adding another portion of the state to the growing data compilation. The first statewide release (OGDC-5) was published in 2009 (Ma and others, 2009) and combined data from 347 source maps. Releases of versions 1 through 5 of OGDC were based on a data model developed during the first phase, which was adopted as the official state standard by the Oregon Geographic Information Council (Ferns and others, 2006). The databases were not completed for releases 4 and higher, because the process was too labor intensive and expensive. The databases only cover the areas completed through Release 3 (Jenks and others, 2006c.).

Release 6 (Smith and Roe, 2015) migrated the database to the ESRI geologic database schema, and Release 7 (Franczyk and others, 2020) migrated the data to the USGS Geologic Map Schema (GeMS) and

added some mapping published since the OGDC-5 release. With the move to GeMS, there is no longer a separate MUP file and database tables, but the thematic attributes have been retained.

The first statewide release (OGDC-5) contained 106,690 polygons representing 7,187 unique units (combination of unit name and source map). Although many units, like Qal (Quaternary alluvium), are comparable over most maps, other units like Tb (Tertiary basalt flows) are quite common but can represent quite different rocks depending on location. Thematic attributes were added to help make maps and queries that combined like units across multiple source maps. The original map unit labels and names were retained as attributes with the thematic attributes, providing additional information. The thematic attributes were populated by groups of regional experts who met for two months to review each source map's units and assign the thematic attributes.

The thematic attributes were initially described by Jenks and others (2005, OGDC-1) and revised in Jenks and others (2006b, OGDC-2). They include:

- ***Thematic Unit Label (TUL)***—the fundamental OGDC unit identifier, which concatenates values from the other thematic attributes
- *Thematic Rock Type*—one of 12 primary rock types
- *Thematic Age*—given as a single epoch, or a range of epochs and/or periods
- *Thematic TerraneGroup*, *Formation*, *Member,* and (sub-)*Unit*—thematic stratigraphic attributes that represent a mix of formal and informal stratigraphic names
- *Thematic Lithology*—primary lithology of the unit, one of dozens of standard options

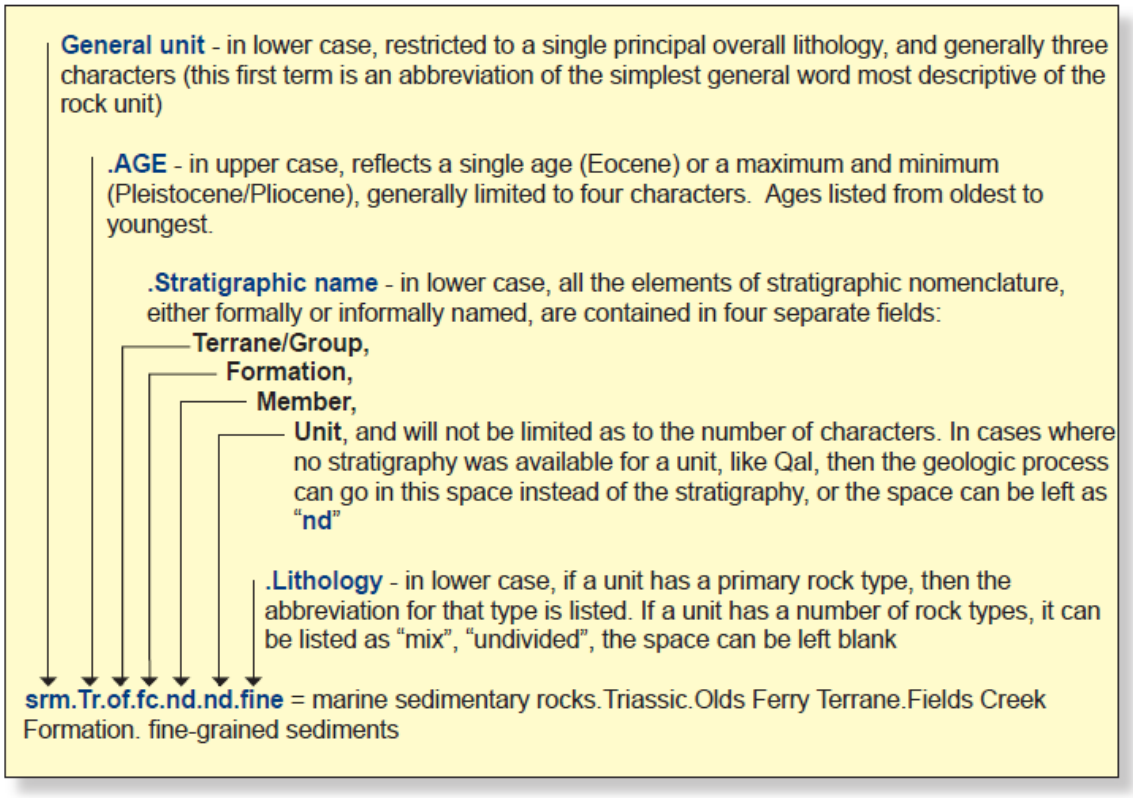
The four thematic stratigraphic attributes—*TerraneGroup*, *Formation*, *Member* and (sub-)*Unit*—are key to the assignment of names and development of the correlation of map units in this project. Creating useful and consistent unit names and stratigraphic assignments was one of the most difficult aspects of the initial OGDC compilation. Oregon has diverse geology, ranging from a Cenozoic marine sedimentary package of generally conformable units with well-defined stratigraphy, to volcanic rocks erupted from thousands of vents and volcanos spanning the entire Cenozoic, to Mesozoic accreted terranes, which mix rocks of all types in structurally bounded units of all sizes. Most units in OGDC were not assigned to any formal stratigraphic unit in their source publications. The solution was for the regional experts to provide informal names for all units based on the four thematic stratigraphic attributes. Where possible, these names conform to existing formal and informal nomenclature; however, it was necessary to invent names for many units. The fundamental unit is the *Thematic TerraneGroup*. This attribute was required for every MUP, as it nominally represents either a mapped exotic terrane or a formal stratigraphic group. The idea behind these first-order units was to make at least one seamless map possible, because many units had no existing names at any of the other three thematic stratigraphic attribute levels (i.e., *Formation, Member,* or *Unit*). In some cases, there were well-established first-order units (e.g., Columbia River Basalt, Umpqua Group, Baker Terrane), but in many cases it was necessary to invent terms (e.g., Nevadan intrusions, Winema Volcanic Field), some of which were simple collections of undifferentiated units (e.g., Neogene Volcanic Rocks, Paleogene Sedimentary Rocks). Using queries on the *Thematic TerraneGroup* field, it is possible to make a seamless statewide map (i.e., seamless in the sense that all areas are represented by a unit, not that there are no map boundary faults), as was done by Madin (2009) in creating a new Oregon statewide geologic map.

The other three thematic stratigraphic attributes were populated in a similar manner, relying on existing names where possible, inventing new names and groupings as deemed appropriate, and leaving them blank (no data) in many cases. There was no requirement that any of the remaining three attributes be populated. One exception to this was for unconsolidated sediments (surficial deposits). All sediments

were assigned to a *TerraneGroup* called "Quaternary surficial deposits" (qsd), and the *Formation* field was used to identify the type of sediment (e.g., alluvial deposits, terrace deposits, playa lake deposits). As a result, it is also possible to make a seamless statewide map of surficial deposits.

The *TUL* attribute was intended to provide a relatively small number of unique units that could be used to make maps and queries, and to quickly identify the important characteristics of a particular MUP. The *TUL* is created by concatenating abbreviations for information from the other thematic attributes, separated by periods (**Figure 1-1**). For example, the Basalt of Sand Hollow (a widespread lava flow of the Columbia River Basalt) has the *TUL* "vol.M.cr.wp.fs.sdh.bas", which represents "lava flows, Miocene, Columbia River Basalt Group, Wanapum Basalt, Frenchman Springs Member, Basalt of Sand Hollow, basalt". The previous release of OGDC-7 had 120,042 MUP assigned to one of 2,014 unique thematic units or *TUL*.

Figure 1-1. *TUL* derivation scheme illustrating the rules that were followed to assign *TUL*, or "Geology Merge", information to all MUP in OGDC-7. Adopted from Ma and others (2009).



1.1.2 New "Compilation Units"

Although the use of *TUL* greatly reduces the number of units in OGDC, the resulting 2,014 units in OGDC-7 were simply too many to make a comprehensible map or graphic time-rock chart that could successfully show the temporal relations among all units. A primary goal of this update to OGDC-8 is to further reduce the number of units by adding a new interpreted attribute, the ***Compilation Unit Name***, which allows us to distill the *TUL* into even fewer map units for correlation. An additional product is a set of time-rock charts that graphically display the relationships between the new set of units and are included as a set of

six accompanying plates. The goal of the new *Compilation Unit Name* (and abbreviated ***Compilation Unit Label***) attribute is to aggregate the *TUL* into units that are more typical of a traditional compilation, both in terms of geographic and stratigraphic span. We aimed to avoid making units that cover small areas or are only locally significant and avoid having units that are overly broad and generalized. We have also retained the majority of *Thematic TerraneGroup* units as defined in OGDC-5 (Ma and others, 2009), though with some slight revisions to follow established naming standards and conventions (see Section 2.4). The scope and budget for this project did not allow for the extensive literature research that would be necessary to support making significant changes to those units. However, several similar *TerraneGroup* units were combined, where appropriate, to reduce the overall number of designations; for example, the former *TerraneGroup* units of "Early Winema Volcanic Field", "Quaternary Winema Volcanic Field", and "Winema Volcanic Field" have been combined into a single "Winema Volcanic Field" *TerraneGroup* in OGDC-8. It is important to keep in mind that the *Compilation Unit Names* are not intended to be formal stratigraphic names but rather serve to help organize the existing *TUL* in OGDC, which are a mix of formal and informal names and names coined just for OGDC.

The result of this effort was the distillation of the 2,014 unique *TUL* in OGDC-7 down to a more manageable 494 Compilation Units in OGDC-8. These Compilation Units are depicted on the regional time-rock charts accompanying this report (see Plates 2–6).

2.0 Methods

2.1 Assigning compilation units

2.1.1 Geographic and stratigraphic division

The first step in assigning the new Compilation Units was to divide the MUP in OGDC geographically and to sort them by their thematic stratigraphic attributes. We divided the state into five geographic regions starting with traditional geologic and physiographic divisions (e.g., Walker, 1977; Orr and Orr, 2012), and we refined them to isolate as many units as possible in a single region. The five geographic regions are shown in **Figure 2-1**, and are:

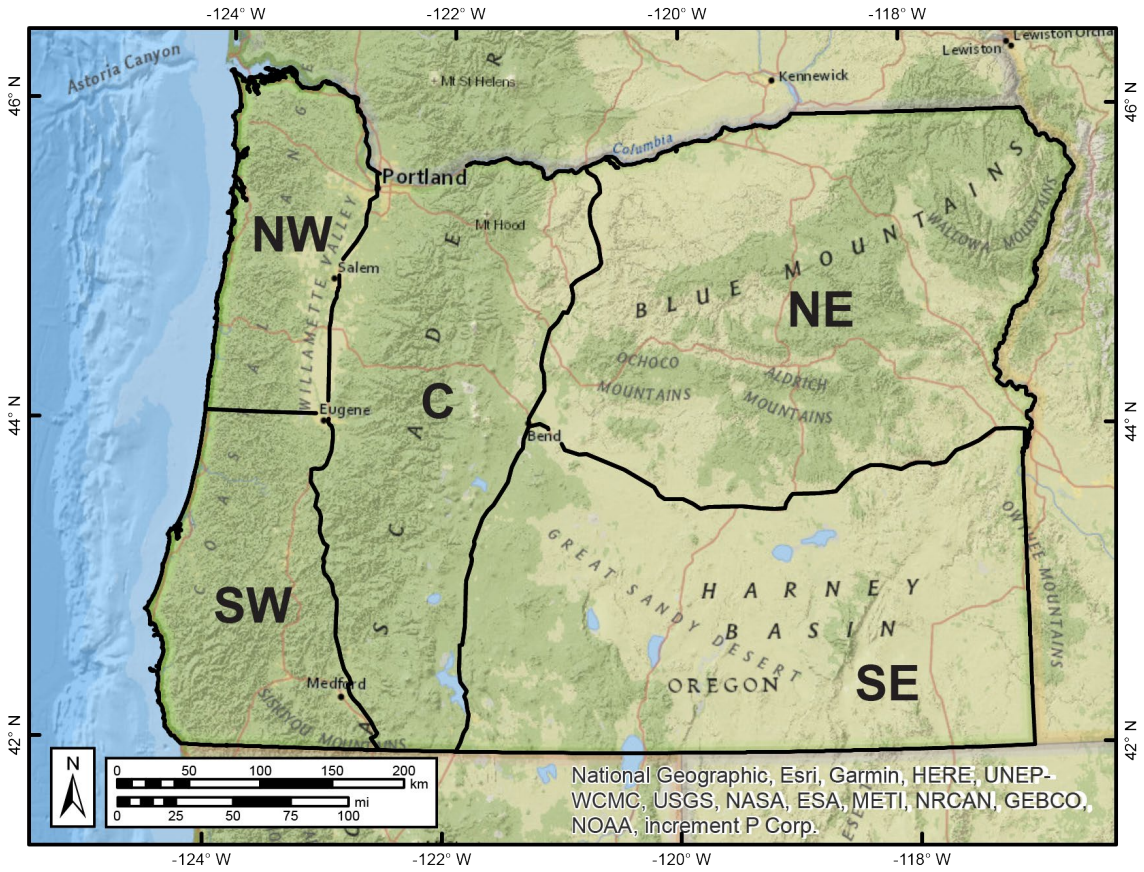
- Northwest (NW) – Cenozoic marine sedimentary basins, comprising several overlapping sequences of Paleocene to Miocene marine sedimentary rocks deposited in the Cascadia forearc, and Miocene Columbia River Basalt Group
- Southwest (SW) – Allochthonous or exotic terranes of southwestern Oregon, comprising mainly Mesozoic metamorphic, sedimentary, and deformed rocks of accreted terranes and Mesozoic batholiths that intrude them
- Cascade Range (C) – Cascade volcanic arc, comprising nearly continuous arc volcanism extending from Eocene to Holocene time
- Northeast (NE) – Allochthonous or exotic terranes of northeastern Oregon, comprising late Paleozoic to Mesozoic metamorphic, sedimentary, and tectonic rocks of accreted terranes and Mesozoic batholiths that intrude them, Paleogene volcanic and sedimentary rocks of the John Day-Clarno Group, and the Miocene Columbia River Basalt Group
- Southeast (SE) – Basin and Range and High Lava Plains province, comprising Neogene volcanic rocks mostly associated with the Yellowstone hot spot and Miocene Columbia River Basalt Group

We dissolved the MUP in OGDC-7 on the *TUL* attribute for each source map, so that there was at most one instance of a particular *TUL* in each map. We dissolved on *TUL* because it is the fundamental unique unit in OGDC, and by source map to minimize the number of MUP to deal with, and to better correlate between source maps. We then extracted all the dissolved bedrock MUP (all units with *Thematic TerraneGroup* other than "Quaternary surficial deposits") and divided them into four subsets based on the thematic stratigraphic attributes:

1. Those with a *Thematic Formation* name
2. Those without a *Thematic Formation* name, but with a *Thematic Member* name
3. Those without either a *Thematic Formation* or *Thematic Member* name, but with a *Thematic* (sub-)*Unit* name
4. Those without a *Thematic Formation*, *Thematic Member,* or *Thematic* (sub-)*Unit* name

We used the geographic group polygons (**Figure 2-1**) to select the intersecting MUP for each of these subsets, which resulted in four subsets of MUP for each of the five geographic groups. The results were sets of units that were highly specific to each region, with minimal overlap other than the Columbia River Basalt Group, which is present in large parts of the NW, NE, and SE regions.

Figure 2-1. Subdivision of geographic groups for regional time-rock charts. A separate time-rock chart and correlation of map units was created for each of these five geographic regions; see Plates 2 through 6 that accompany this report. C = Cascade Range.



2.1.2 Compilation Unit Names and Compilation Unit Labels

For each new Compilation Unit, a unique ***Compilation Unit Name*** was assigned for each dissolved *TUL* using the following rules:

- If a *TUL* had an existing *Thematic Formation* name, it was used for the *Compilation Unit Name.*
- If a *TUL* did not have a *Thematic Formation* name but did have a *Thematic Member* name, the *Thematic Member* name was used.
- If the *TUL* had neither *Thematic Formation* nor *Thematic Member* names but did have a *Thematic* (sub-)*Unit* name, then the *Thematic* (sub-)*Unit* name was used.
- If a *TUL* had no thematic names, a name was created by combining the *Thematic TerraneGroup* and *Thematic Rock Type* attributes, or in some instances, the *Thematic Lithology* attribute.

In addition to the new *Compilation Unit Names*, an abbreviated ***Compilation Unit Label*** was also created for each MUP in OGDC. The purpose of the *Compilation Unit Label* is to make it easier to label the blocks depicted on the time-rock charts, because most *Compilation Unit Names* are too long to fit legibly. The *Compilation Unit Labels* were created by combining the abbreviation for the *TerraneGroup* attribute (in uppercase letters) with the abbreviation for the *Thematic Formation, Thematic Member, Thematic (*sub-)*Unit, Thematic Rock Type,* or *Thematic Lithology* attribute (in lowercase letters) that is used for the *Compilation Unit Name*. These *Compilation Unit Labels* are analogous to the lithic designator or map unit symbol used on a geologic map, except that the capitalized portion reflects the corresponding *TerraneGroup* of the MUP rather than its geologic age.

2.1.3 Units with errors and changes

A separate "errors and changes" file was created to capture MUP that had errors or that needed to have attributes changed. Errors were typically typos, or, more rarely, obviously incorrect assignments of a thematic attribute. MUP that needed changes were far more common, and the changes were typically required to align the *TUL* with the chosen *Compilation Unit Name*. Although many different *TUL* could be assigned to the same Compilation Unit, all instances of a particular *TUL* (e.g., the same *TUL* but from different source maps) were required to belong to the same Compilation Unit. In cases where there was good evidence that the same *TUL* from different maps should be assigned to different Compilation Units, the *TUL* was changed to match its appropriate Compilation Unit, and a copy of the changed MUP was placed in the "errors and changes" file. In that file, we recorded the original *TUL*, the new *TUL*, and a comment explaining the change. For example, for the "Little Butte Volcanics" *TerraneGroup*, units with the *TUL* "vlc.O.LBV.nd.nd.nd.mix" were assigned to the "Little Butte Volcanics volcaniclastics" Compilation Unit, and units with the *TUL* "vlc.O.LBV.nd.nd.nd.tff" were assigned to the "Little Butte Volcanics tuffs" Compilation Unit. For some instances of the *TUL* "vlc.O.LBV.nd.nd.nd.mix", the original MUP name clearly indicated that the volcaniclastic rocks were tuffs, so those instances of the *TUL* were assigned to "Little Butte Volcanics tuffs" and their *TUL* were changed to "vlc.O.LBV.nd.nd.nd.tff". These changes were then documented in the "errors and changes" file.

Although the intent of the project was to make as few changes to the original *TUL* designations as possible, the implemented revisions result in a more accurate and less generalized map. This is the only instance in which original ODGC-7 data were changed in the new OGDC-8.

2.1.4 Exceptions

There are two major exceptions to the procedures outlined above. The first is for the units belonging to the "Columbia River Basalt Group" *Thematic TerraneGroup*, which is indicated by the abbreviated *Compilation Unit Label,* "CR" on the time-rock charts. The Columbia River Basalt Group is unique in that it is comprised of dozens of individual lava flows that cover exceptionally large geographic extents, have a consistent and well-documented stratigraphy, and can be definitively distinguished with modern geochemical and paleomagnetic mapping. It is current practice for geologic maps to break out units of the Columbia River Basalt Group down to the individual flow (e.g., Madin and McClaughry, 2019; Wells and others, 2020), whereas earlier maps might have only divided them into three formations or even mapped it as a single undivided unit. Because the Columbia River Basalt Group is such an important regional unit, we assigned *Compilation Unit Names* that provide the maximum stratigraphic resolution, even if that means departing from the rules outlined in Section 2.1.2, above. For example, the "Basalt of Ginkgo" is a sub-unit within the Frenchman Springs Member of the Wanapum Basalt. Its *TUL* is "vol.M.cr.wp.fs.gk.bas" and, according to the rule, should be assigned the existing *Formation* name, "Wanapum Basalt". However, since this sub-unit covers over 46,000 km^2 (17,760.7 mi^2) in Oregon and Washington and flowed more than 400 km (248.5 mi) from its vent source, it is important to separate it from its enclosing *Member* and *Formation* wherever possible. This results in a complex depiction in the time-rock charts, which need to show these nested sets of stratigraphic units (see Plates 2, 4, and 5).

The second major exception to the rules is in the Southeast geographic region, where large areas are covered by units of undivided basalt or terrestrial sedimentary rocks. We are now able to divide many of these units, which results in many *TUL* mapping to multiple Compilation Units. That required changing the *TUL* for many individual MUP. The procedure was the same as that described in Section 2.1.3 above, but it was applied to many MUP and without them being dissolved by their source maps. By implementing the changes to individual MUP, it was possible to divide some of the more extensive units and to greatly improve the geologic resolution of these areas.

2.2 Updates Included in New OGDC-8

2.2.1 Compilation Unit attributes

We updated OGDC-7 by adding two new attribute fields containing the newly developed *Compilation Unit Names* and *Compilation Unit Labels*. The resulting version is now OGDC-8, which is included in this publication. The new attribute fields include:

- *CompilationUnitName* – One of 494 unique names assigned to each MUP in OGDC-8 (see Section 2.1.2)
- *CompilationUnitLabel* – Abbreviation of the *CompilationUnitName* field used to label each Compilation Unit on time-rock charts

2.2.2 Correction of topology and attribute errors

Topology rules were designed to follow the USGS Geologic Map Schema, or GeMS, a standard format for the digital publication of geologic maps (U.S. Geological Survey National Cooperative Geologic Mapping Program, 2020). All topologies were evaluated and resolved as necessary to comply with GeMS. Thematic attributes in the "MapUnitPolys" feature class were revised to ensure that:

- Spelling, capitalization, and grammar are consistent throughout
- Naming conventions match any formal stratigraphic names in Geolex, where available
- Each thematic attribute entry has a unique abbreviation in the *TUL* (see Figure 1)
- Upper-level thematic attributes (e.g., *TerraneGroup* or *Formation*) match their assigned lower-level attribution (e.g., *Member* or *Unit*) throughout

2.2.3 Addition of recent mapping

In addition to including the new fields for *Compilation Unit Name* and *Compilation Unit Label*, we updated OGDC-8 with a recently published, 1:63,360-scale geologic map of the greater Portland metropolitan area and surrounding region in Oregon and Washington (Wells and others, 2020). The Oregon portion of the map covers an area of ~5,400 km^2 (~2,085 mi^2) and is now included in OGDC-8. This map was recently published in GeMS format, so it was easy to include it in the update after assigning their geologic units to the correct *TUL* and Compilation Unit. The methods for assigning *TUL* and Compilation Units were the same as described above in Section 1.1 and Section 2.1, respectively.

2.3 Time-rock charts

A time-rock chart or diagram is a graphical representation of the ages and stratigraphic relations among geologic units that is included on most published geologic maps. It is useful for understanding how rock units from various locations correlate with specific periods of geologic time. Although detailed vertical and lateral stratigraphic relations among units are not easily represented in this format, the main purposes of a time-rock chart are to illustrate the absolute age spans and temporal relations among all units on a geologic map and to visualize how rocks of similar ages can be found in separate locations. This format can be particularly useful for recognizing the temporal equivalence of geologic units that have been given different names in different places by different mappers. A time-rock chart is therefore an essential tool for interpretating geologic map information and for reconstructing past environments and geologic histories at a regional scale.

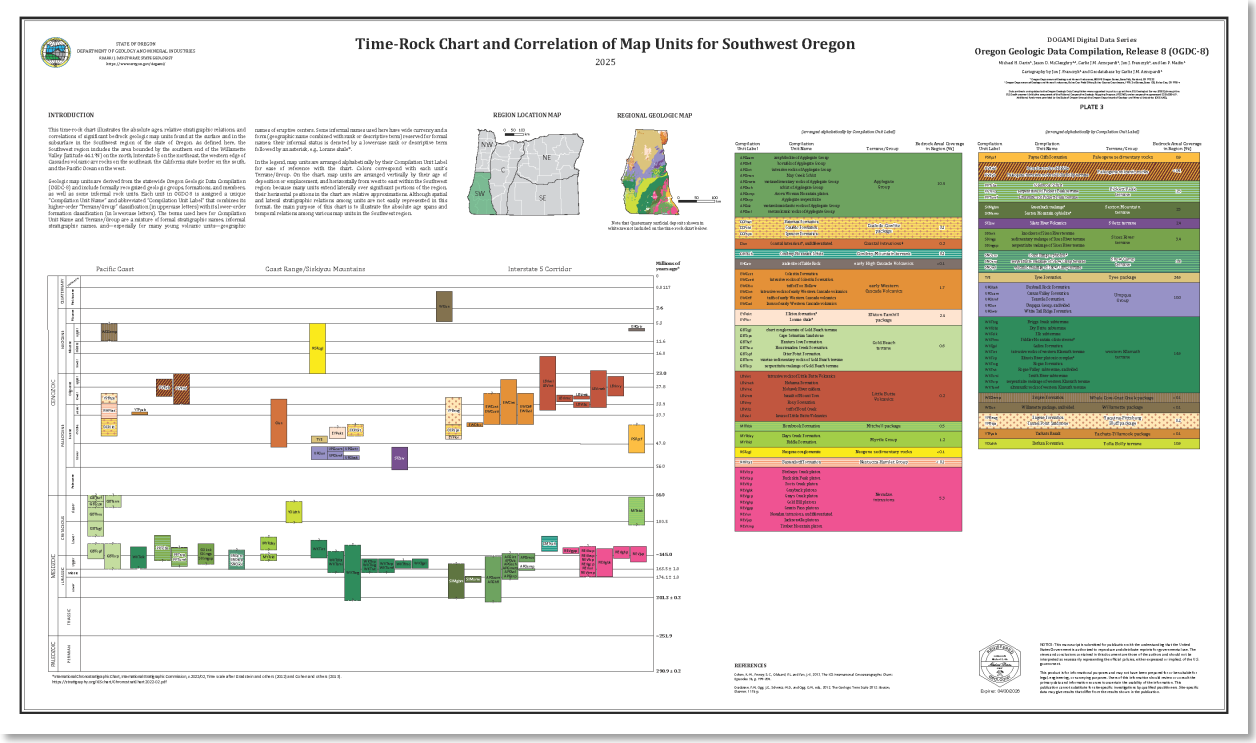
For this update to OGDC-8, we created a series of six graphical time-rock charts that illustrate the absolute and relative ages and correlations of bedrock geologic map units within the state. Because the intended focus is on bedrock geology, unconsolidated sedimentary deposits that are assigned to the "Quaternary surficial deposits" *Thematic TerraneGroup* in OGDC-8 are excluded from these charts. The initial chart (Plate 1) depicts all geologic units in OGDC-8 according to their *Thematic TerraneGroup* classification and shows how they correlate in time and space statewide. The remaining charts (Plates 2–6) show stratigraphic correlations at the *Formation* (or lower) level, utilizing the new *CompilationUnitName* field, within each of five distinct geographic regions: Northwest Oregon, Southwest Oregon, the Cascade Range, Northeast Oregon, and Southeast Oregon (**Figure 2-1**). This geographic subdivision is beneficial because a single statewide chart at the *Formation* level would necessarily include 494 different units, making it challenging to interpret. An example of the time-rock chart for the Southwest region (Plate 3) is shown in **Figure 2-2**.

2.3.1 Chart construction and layout

Regional time-rock charts were constructed by first clipping the MUP in OGDC-8 to the geographic region boundaries (**Figure 2-2**). Each regional chart therefore includes only the Compilation Units that are

specific to that region. Boxes were created for each Compilation Unit in the region, and placed on the chart such that the height of each box spans the range of geologic time during which the rocks were initially deposited or emplaced. The geologic time scale is depicted in a way that emphasizes the Cenozoic Era (66 Ma to Present), which is when most units in the state were formed. To facilitate the placement of all rock units on the chart, the timescale is nonlinear such that isochrons (timelines) for the Paleozoic and Mesozoic Eras are condensed vertically; isochrons for the Paleocene through Miocene Epochs of the Cenozoic Era are expanded, and the Pliocene Epoch and Quaternary Period are even more expanded. The time span of each Compilation Unit was determined through a review of relevant published geologic maps and literature and by cross-referencing with the geochronology data compilation included in OGDC-8 ("GeochronPoints" feature class).

Figure 2-2. Example of one of the five regional time-rock charts (Southwest Oregon; Plate 3) produced for this report. Each box on the chart represents a newly assigned Compilation Unit; colors correspond with the *Thematic TerraneGroup* classification in OGDC-8 for each unit.



The colors depicted on each time-rock chart correspond with a unit's *TerraneGroup* classification. In the legend, map units are arranged alphabetically by their new *Compilation Unit Label* for ease of reference with the chart. On the chart, each Compilation Unit is depicted as a box of uniform width and arranged vertically by its age of deposition or emplacement. The horizontal positions of each Compilation Unit 'box' were chosen to approximate the relative locations of each Compilation Unit from west to east within the state or region. Because each box can have only one position in the time-rock chart, it is difficult to portray the true spatial distribution of laterally extensive units in this format. The horizontal positions of units in the chart are therefore relative approximations. For this reason, each chart features a statewide or regional geologic map that highlights the actual spatial distribution of units shown on the chart and colored by their *TerraneGroup* classifications.

In addition to the *Compilation Unit Label*, *Compilation Unit Name*, and *TerraneGroup*, the legend also includes the areal extent of each Compilation Unit relative to the total bedrock area of the state or region. This is intended to help identify and distinguish units that have a significant areal coverage or extent (e.g., Columbia River Basalt Group, 21.9% of state; Plate 1) from those with relatively limited exposure (e.g., Condrey Mountain Terrane, <0.1% of state; Plate 1).

2.4 Correlation with Geolex

As mentioned above, the terms assigned in OGDC-8 for the *TerraneGroup* and new *Compilation Unit Name* fields are a mixture of formal stratigraphic names, informal stratigraphic names, and—especially for many young volcanic units—geographic names of eruptive centers. For this project, we cross-referenced these *TerraneGroup* and *Compilation Unit Names* with Geolex, the USGS database of geologic unit names and usage, to determine which names were common to both data sets and to ensure adherence to established guidelines for stratigraphic nomenclature in the North American Stratigraphic Code (North American Commission on Stratigraphic Nomenclature, 2005).

First, all MUPs in OGDC-8 were dissolved based on their *Compilation Unit Name*, which resulted in 494 unique names statewide. This list was then cross-referenced and compared against the complete list of all 417 geologic unit names that exist in the Geolex catalog for the state of Oregon at the time of this publication. A total of 194 *Compilation Unit Names* in OGDC-8 have a matching unit name in Geolex, meaning that their unit names match precisely or nearly exactly between the two compilations. These *Compilation Unit Names* are formal, as indicated by their uppercase rank or descriptive term (e.g., Tyee Formation).

Of the remaining 300 *Compilation Unit Names* that have no obvious corresponding match in Geolex, the majority are informal names designated in this project that correspond with specific Neogene or Quaternary volcanic fields or edifices. These informal names are indicated by their lowercase descriptive terms in their names (e.g., basalt of Cascade Head; Mount Hood volcano). Some of the informal *Compilation Unit Names* used here have wide currency and a form (geographic name combined with rank or descriptive term) that is typically reserved for formal names; their informal status is denoted by a lowercase rank or descriptive term followed by an asterisk (e.g., Ortley member*).

This consolidation of geologic units in OGDC-8 based on the new *Compilation Unit Name* field provides opportunities for updates to Geolex that refine the current versus abandoned usage of formally recognized units in the state and evaluate whether widely used informal names should be elevated to a formal status.

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4.0 REFERENCES

Jenks, M. D., Staub, P. E., Ferns, M. L., Madin, I. P., Ma L. and Geitgey, R. P., 2005, Oregon Geologic Data Compilation (Northeast Oregon); Oregon Department of Geology and Mineral Industries, OGDC-1, CD.

Jenks, M. D., Ferns, M.L., Staub, P. E., Madin, I. P., Geitgey, R. P., Ma, L., and Niewendorp, C., 2006a, Oregon Statewide Geologic Map Data: Preliminary Geologic Compilation Map of the Southeast Portion of Oregon: Oregon Department of Geology and Mineral Industries Open-File Report O-06-04.

Jenks, M. D., Staub, P. E., Ferns, M. L., Madin, I. P., Ma L. and Geitgey, R. P., 2006b, Oregon Geologic Data Compilation (Southeast & Northeast Oregon), Oregon Department of Geology and Mineral Industries OGDC-2, CD.

Jenks, M. D., Staub, P. E., Ferns, M. L., Madin, I. P., Ma L. and Geitgey, R. P., 2006c, Oregon Geologic Data Compilation (Central, Southeast & Northeast Oregon), Oregon Department of Geology and Mineral Industries OGDC-3, CD.

Jenks, M. D., Mertzman, S. A., Wiley, T. J., Staub, P. E., Drazba, M., Ma, L., Niewendorp, C. A., and Madin, I. P., 2007, Preliminary Geologic Compilation Map of the Southwest Portion of Oregon: Oregon Department of Geology and Mineral Industries Open-File Report O-07-16.

Jenks, M. D., Wiley, T.J., Ferns, M.L., Staub, P.E., Ma L., Madin, I.P., Niewendorp, C.A., Watzig, R.J., Taylor, E.M., and Mertzman, S.A., 2008, Oregon Geologic Data Compilation (Northeast Oregon); Oregon Department of Geology and Mineral Industries, OGDC-4, CD.

Ferns, M. L., Geitgey, R. P., Jenks, M. D., Ma. L., Madin, I. P., McConnell, V. S., and Staub, P. E., 2006, Oregon Statewide Geologic Map Data: A Pilot Project Where Digital Techniques Changed the Geologic Map Compilation Process and Product: Oregon Department of Geology and Mineral Industries Open-File Report O-06-03.

Franczyk, J. J., Madin. I. P., Duda, C. J. M., and McClaughry, J. D., 2020, Oregon Geologic Data Compilation Release 7 (OGDC-7): Oregon Department of Geology and Mineral Industries Digital Data Series OGDC-7.

Ma, L., Madin, I. P., Olson, K. V., Watzig, R. J., Wells, R. E., Niem, A. R., and Priest G. R. (compilers), 2009, Oregon geologic data compilation (OGDC) release 5 (statewide): Oregon Department of Geology and Mineral Industries Digital Data Series OGDC-5.

Madin, I. P., and McClaughry, J. D., 2019, Geologic map of the Biggs Junction and Rufus 7.5' quadrangles, Sherman and Gilliam Counties, Oregon: Oregon Department of Geology and Mineral Industries Geologic Map 124.

Niewendorp, C. A., Jenks, M. D., Ferns, M. L., Staub, P. E., Taylor, E. M., Ma, L., and Madin, I. P., 2007, Preliminary Geologic Compilation Map of the Central Portion of Oregon: Oregon Department of Geology and Mineral Industries Open-File Report O-07-08.

North American Commission on Stratigraphic Nomenclature, 2005, North American stratigraphic code: American Association of Petroleum Geologists Bulletin, v. 89, no. 11, p. 1547–1591.

Orr, E. L., and Orr, W. N., 2012, Oregon Geology (6th edition), Corvalis, Oregon: Oregon State University Press, 304 p.

Smith, R.L., and Roe, W. P., compilers, 2015, Oregon Geologic Data Compilation [OGDC], Release 6 (statewide): Oregon Department of Geology and Mineral Industries Digital Data Series OGDC-6, Esri geodatabase. https://pubs.oregon.gov/dogami/dds/p-OGDC-6.htm.

U.S. Geological Survey National Cooperative Geologic Mapping Program, 2020, GeMS (Geologic Map Schema)—A standard format for the digital publication of geologic maps: U.S. Geological Survey Techniques and Methods, book 11, chap. B10, 74 p., https://doi.org/10.3133/tm11B10.

Walker, G. W., 1977, Geologic map of Oregon east of the 121st meridian: U.S. Geological Survey Miscellaneous Investigations Map I-902, 2 sheets, scale 1:500,000. https://ngmdb.usgs.gov/Prodesc/proddesc_9795.htm.

Wells, R. E., Niem, A. R., Priest, G. R., Ma, L., Niewendrop, C. A., and Madin, I. P., 2008, Preliminary digital compilation map of part of western Oregon: Oregon Department of Geology and Mineral Industries Open-File Report O-08-13.

Wells, R. E., Haugerud, R. A., Niem, A. R., Niem, W. A., Ma, L., Evarts, R. C., O'Connor, J. E., Madin, I. P., Sherrod, D. R., Beeson, M. H., Tolan, T. L., Wheeler, K. L., Hanson, W. B., and Sawlan, M. G., 2020, Geologic Map of the Greater Portland Metropolitan Area and Surrounding Region, Oregon and Washington: U.S. Geological Survey Scientific Investigations Map 3443, pamphlet 55 p., 2 sheets, scale 1:63,360, https://doi.org/10.3133/sim3443.