Oregon Department of Geology and Mineral Industries
Brad Avy, State Geologist

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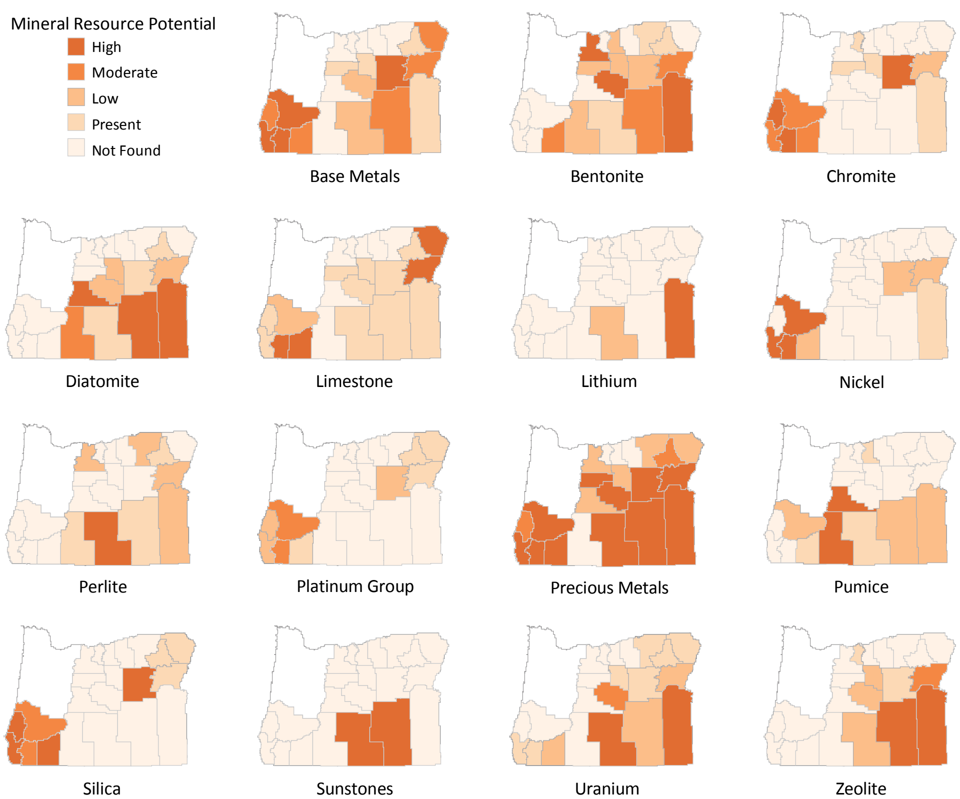
METALLIC AND INDUSTRIAL MINERAL RESOURCE POTENTIAL OF SOUTHERN AND EASTERN OREGON: REPORT TO THE OREGON LEGISLATURE



Ian P. Madin[1], Robert A. Houston[1], Clark A. Niewendorp[1], Jason D. McClaughry[2],
Thomas J. Wiley[1], and Carlie J.M. Duda[1]

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[1] Oregon Department of Geology and Mineral Industries, 800 NE Oregon St., Ste. 965 Portland, OR 97232
[2] Oregon Department of Geology and Mineral Industries, Baker City Field Office, Baker County Courthouse, 1995 3rd St., Ste. 130, Baker City, OR 97814

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Cover image: Maps show mineral resource potential by individual commodity.
See the report text for criteria used to determine ratings.

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For additional information:
Administrative Offices
800 NE Oregon Street, Suite 965
Portland, OR 97232
Telephone (971) 673-1555
Fax (971) 673-1562
http://www.oregon.gov/dogami

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INTRODUCTION

The 2015 Oregon Legislature passed HB 3089, which required the Department of Geology and Mineral Industries (DOGAMI) to prepare a report that included:

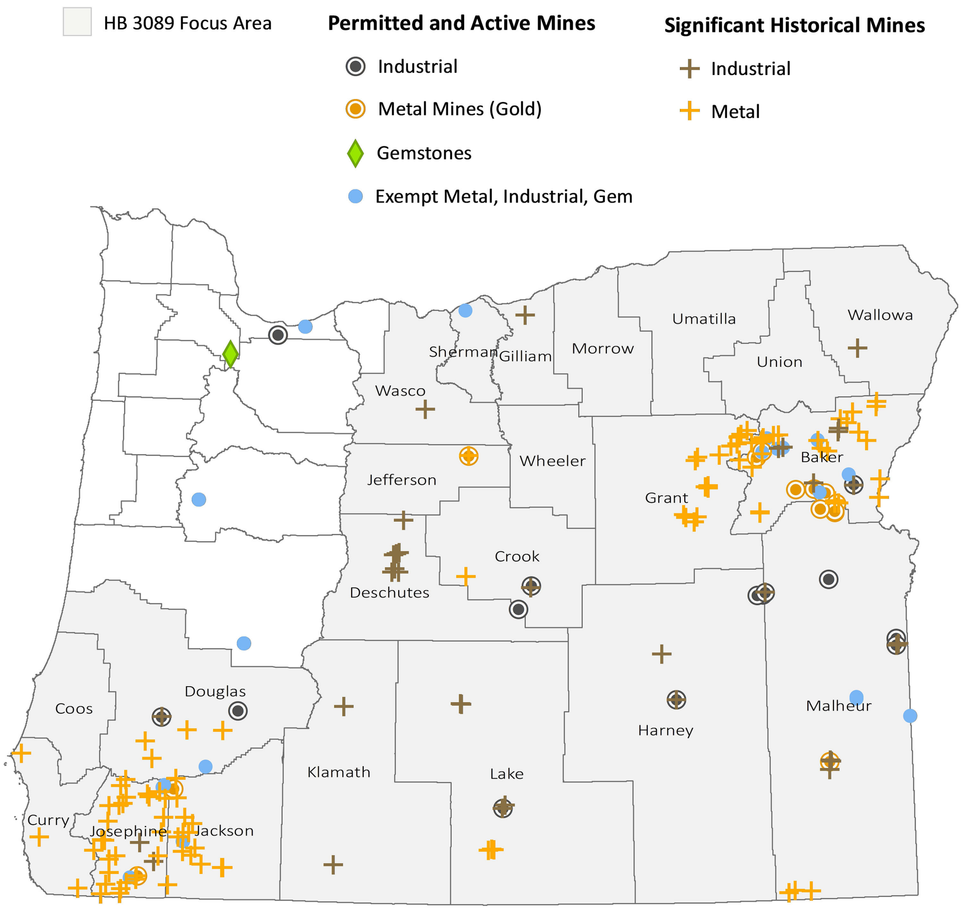
1. A list of all relevant mineral inventories and studies previously completed by the department. *A comprehensive list has been complied and published on the department's website and is included in report Appendix B.*
2. A description of the estimated costs to the department for making the results of mineral inventories available online. *All DOGAMI publications, including mineral resource inventories, have been available for free download in the department's online Publications Center since December 2015. The cost of including published mineral inventories and reports was not significant.*

Also required, and included in this report, were:

3. A review of the mineral resource potential of eastern and southern Oregon counties based on published data and research previously completed and available to the department, including an assessment of which metallic and industrial mineral commodities are most likely to be economically developable. *DOGAMI evaluated the mineral resource potential at the county level for 22 southern and eastern Oregon counties. The evaluation is a high-level assessment designed for policy makers and the public.*
4. Recommendations, including estimated related costs, for the department to engage in continued mineral resource potential assessment activities in southern and eastern Oregon with the department's existing personnel. *Recommendations for further mineral resource assessment activities are designed to encourage and support environmentally responsible mining in southern and eastern Oregon, as called for in Section 1 (5) of HB 3089.*

HB 3089 also required that this report be posted on the DOGAMI website. The web page linking to the report is http://www.oregongeology.org/pubs/ofr/p-O-16-06.htm.

Figure 1. Map of Oregon showing the 32 currently permitted and active metal and industrial mineral mines statewide, and the 133 most productive historical mines in the study area. Shading indicates the 22 counties evaluated in this study.



MINING IN OREGON

Mining has been a part of Oregon's economy since the days of early settlement. Mining operations have changed greatly since the gold rush days, and the role of DOGAMI has evolved as well. The Agency was created by the Legislature in 1937, with statutory duties that focused on studying the mineral resources of the state, providing information to the public about those resources, and supporting and promoting mineral resource exploration and mining activities. The agency provided free assays of Oregon ores, provided "grubstake" funds for prospectors, tested Oregon mineral occurrences to determine the best ore processing steps and to identify new markets, and published mineral resource assessments. Since the 1980s the Agency's primary role in mineral resources has been oversight of mineral production, with an emphasis on minimizing the environmental and other impacts of mineral extraction and maximizing opportunities for land reclamation (See Policy section of ORS 517.460). The current goal of the Agency's resource management program is to administer effective and balanced regulation of mineral resource development to support the environment, economy, and people of Oregon.

Historical Mining Activity

By the early 1900s mining activity in the state was so widespread that the Oregon Bureau of Mines and Geology 1916 Handbook of Mines was over 300 pages long and listed several hundred mines and prospects in nearly 75 districts. In 1939, DOGAMI listed 1,621 known metal mines or prospects, of which 200 were active. Gold mines in southern and eastern Oregon produced an estimated total of more than 6 million troy oz*., worth about $8.4 billion at current prices ($1,327/oz., 9/2/2016 spot price). In addition to gold and other metals, Oregon mines have produced a variety of industrial minerals and gem materials, with most of the production coming from southern and eastern Oregon (**Figure 1**, Plate 1).

Table 1 summarizes the total reported mineral production for the state through 2011. These data represent a minimum estimate because mineral production has not been systematically reported in Oregon. Although definitive production records are not available, two of the largest Oregon gold producers were the Cornucopia lode mine (~306,000 oz., or $406 million at current price) and the Sumpter placer dredge mine (~297,000 oz., or ~$394 million at current price), both in Baker County (Plate 1).

The majority of historic mining in Oregon was for gold. Gold mining diminished dramatically during World War II, when gold mines were closed to divert resources to the war effort. The mining industry has changed dramatically since then. The majority of Oregon mines that operated during the last century were small operations mining thousands of tons of high-value ore. Today, metal mining, and gold mining in particular, is dominated by very large scale industrial operations that mine millions of tons of low-value ore. For comparison, Nevada produced about 5 million ounces of gold in 2014 from 27 mines, with 90% of the production from the 13 largest mines. Seven of those mines produced more in 2014 than the total production for the Sumpter and Cornucopia mines, Oregon's top historic producers.

Records held by Baker County include claims as early as 1862. The U.S. Bureau of Land Management maintains a mining claim database for federal lands that extends from 1976 to the present. Within the counties studied, the database includes over 6,200 active claims and ~ 110,000 closed claims (see Plate 1).

Table 1. Total reported Oregon production of metals and industrial minerals through 2011.

Commodity	Total Recorded/Estimated Production
Limestone	2,451,000 tons (cement)
Chromite	127,531 tons
Clay	11,210,000 tons (brick and specialty)
Copper	17,640 tons
Diatomite	75,000 tons
Emery	1,150 tons
Gemstones	$57,873,000
Gold	6,362,228 troy oz.
Lead	1,150 tons
Manganese	317 tons
Mercury	95,319 flasks
Nickel	435,816 tons
Perlite	16 tons (likely very low estimate)
Pumice	15,518,000 tons
Silver	6,270,491 troy oz.
Talc	1,554 tons
Uranium	6,672 tons
Zinc	1,277 tons

* A troy ounce is slightly heavier than a regular ounce: 31.1 grams vs. 28.35.

Current Mining Activity

The U.S. Geological Survey (USGS) publishes annual national summaries of mineral production that include state level data. These reports are based on information provided by the industry voluntarily and are probably minimum estimates. Historically, DOGAMI played a key role in collecting this information, but the department has not had the capacity to do so for at least two decades. In the most recent year for which data from the U.S. Geological Survey are available (2012), the total reported value of metallic and industrial mineral products mined in Oregon was ~$93 million. Of this, $1.15 million was gemstones, and the remainder was the combined value of limestone, bentonite, diatomite, emery, perlite, pumice, and zeolites. This value includes Portland cement, a manufactured product based on locally mined limestone, which probably accounts for the majority of the total value. For the same year, the total reported production of aggregate and crushed stone was ~$198.5 million.

As of July 2016, there were 33 industrial mineral, gem, or metal mines permitted by DOGAMI in Oregon (**Figure 1**, Plate 1). There are no publicly available data on whether or how much these mines produce.

Mine operators are required to obtain an operating permit from DOGAMI only if they disturb an area greater than 1 acre per year up to a maximum of 5 acres in 5 years, or mine more than 5,000 cubic yards of material annually (for reference, this is equivalent to removing about 3.5 ft of material over an acre). Starting in 2016, surface mining operations below the permit threshold are required to register with DOGAMI and obtain an Exclusion Certificate that will provide a better understanding of the extent of small-scale mining in Oregon, although operators will not be required to report their production. Currently, 23 mines are known to be in this category.

It is also difficult to estimate the amount of exploration activity currently taking place in the state. The only data available are BLM records of active claims, and the number of active DOGAMI exploration permits, which are required for mechanized sampling or drilling. There are currently 6,168 active claims and 8 active exploration permits.

Important Terms

Mineralization
Any process whereby minerals are concentrated or deposited.

Mineral occurrence
A place where a useful or valuable mineral is known to be present.

Mineral deposit or resource
A sufficiently large concentration of a useful or valuable mineral that extraction at a profit may be feasible under current or foreseeable conditions.

Identified resource
A resource whose location, grade, quality, and quantity are known or can be estimated from specific geologic evidence.

Mineral resource potential
The likelihood for the occurrence of undiscovered mineral resources or deposits.

Source:
Goudarzi, G.H. (compiler), 1984, Guide to preparation of mineral survey reports on public lands: U.S. Geological Survey Open-File Report 84-787. http://pubs.usgs.gov/of/1984/0787/report.pdf

Mining Economics

The path from the initial discovery of an occurrence of a valuable mineral to a profitable mine is long and difficult, and the vast majority of discoveries never become mines. In order for a mineral occurrence to become a resource, it is necessary to define accurately the location, quality, and quantity of the target commodity. This usually requires extensive geologic evaluation, including geologic mapping, geophysical surveys, exploratory drilling, sampling, and chemical analysis and assaying. In order to show that a resource is economic and can be profitably mined, it is necessary to define accurately the factors controlling the cost of mining, such as the amount of barren rock that must be moved in order to access the valuable minerals and the specific milling processes needed to extract the valuable materials efficiently from the ore. It is also necessary to obtain the required permits and develop plans and facilities to handle overburden and tailings and reclaim the property after mining is complete as well as building the necessary power, water, and transportation infrastructure. The result is that costs for exploration and development of a mine can be tens to hundreds of millions of dollars. These requirements, coupled with volatile mineral prices and markets, makes mining an inherently risky venture. Modern metal mines are very large-scale industrial operations that require long mine life and large reserves in order to justify the enormous investment required to go into production. Industrial mineral mines may be less capital intensive to develop, but they typically have high transportation costs, so that even high-quality deposits may not be profitably mined if an adequate transportation infrastructure does not exist.

A current example of a mining venture is the Grassy Mountain project to develop a medium-size underground gold mine in Malheur County. The occurrence was first identified and claimed in 1984 by independent prospecting geologists. Atlas Precious Metals acquired the property in 1986. The property was subsequently sold to Newmont Exploration, then to Tombstone Exploration, and then to Seabridge Gold. Calico Resources Inc. acquired the property and began the process of obtaining an operating permit. In 2016, Calico was acquired by Paramount Gold Nevada Corporation. Successive owners conducted additional exploratory work to better define the deposit. To date, 245 exploratory holes totaling ~38 miles in length (198,596 ft) have been drilled, sampled, and analyzed. DOGAMI estimates the total cost of exploration drilling and sampling at Grassy Mountain at $30 million. A public Preliminary Economic Assessment (PEA) that Calico Resources prepared for the project estimates that it contains 503,700 oz. of gold and 843,000 oz. of silver that can be mined underground, increasing to 1,149,000 oz. of gold and 4,133,000 oz. of silver if mined as an open pit. The PEA estimates that the project will require $144 million in capital, of which ~$1.5 million is for permitting and will ultimately net ~$156.6 million, assuming a constant gold price of $1,300/oz.

These numbers underscore the fact that developing a modern gold mine is a long and expensive process. Most gold mines opened in the United States in recent years have therefore developed deposits with very large reserves, typically exceeding 1 million ounces of gold. Development of new gold mines in Oregon will require identification of very large or high-grade deposits, or a sustained period of much higher gold prices that current values.

For commodities like gemstones, landscape rock, and industrial minerals a thorough market analysis and marketing or branding campaign might support the development of new mines in Oregon. This kind of analysis is outside the expertise of DOGAMI.

REVIEW OF MINERAL RESOURCE POTENTIAL

Introduction

HB 3089 defined the study area for the mineral resource potential review as “eastern and southern Oregon counties,” so this report covers Baker, Coos, Crook, Curry, Deschutes, Douglas, Gilliam, Grant, Harney, Jackson, Jefferson, Josephine, Klamath, Lake, Malheur, Morrow, Sherman, Umatilla, Union, Wallowa, Wasco, and Wheeler counties (**Figure 1**). As directed by HB 3089, this report covers only metallic and industrial mineral resources, excluding rock for aggregate and building stone, sand and gravel, coal, oil and gas, and geothermal resources. DOGAMI based the review on its own published reports, maps, and databases as well as data from the USGS and other publications. Plate 1 is a map showing key mineral resource information.

This review is a high-level, qualitative assessment, designed to provide policy makers and the public with general information about the mineral resource potential of eastern and southern Oregon counties. A geographically specific and technically detailed assessment was beyond the scope of the funding available for this work. The

Recommendations section of this report outlines the kind of studies needed for an in-depth technical assessment, and Appendix A provides estimated related costs.

Selection of Mineral Commodities

Although a wide range of mineral commodities has been found in Oregon, this report focuses on minerals likely to be economically developable under current economic conditions. Minerals evaluated for this report are those that might support new mining activity, with historical production and exploration data among the most important factors in selection. Oregon has been explored for over 150 years, and it is likely that most types of mineral occurrence that are present have already been encountered. The selected commodities are:

- base metals: copper, lead, and zinc
- bentonite
- chromite
- diatomite
- limestone
- lithium
- nickel
- perlite
- platinum group metals; platinum, palladium
- precious metals: gold and silver
- pumice
- silica
- sunstones
- uranium
- zeolites

There has been considerable interest in exotic minerals that are in increasing demand for the high-tech industry, including rare earth elements (REE) and tellurium. These commodities were not systematically evaluated because the potential is very low. There are no production, exploration, or geochemical data that identify any potential for a REE resource, and the geologic settings that host REE occurrences have not been found in Oregon. Exploration for REE resources would be highly speculative given the current state of knowledge. Although there are some data on the occurrence of tellurium in Oregon, this mineral is primarily a by-product of gold mining and is highly unlikely to be mined independently.

ASSESSMENT METHODOLOGY

Mineral resource potential is defined as the likelihood for the occurrence of undiscovered mineral resources in an area. A new mineral resource may be discovered in a location where there was no previous indication or evidence of a mineral occurrence, but it is most likely that a new mineral resource will be identified by mapping, sampling, and evaluating known occurrences. Therefore, the most cost-effective approach to identifying a resource and developing a mine is to look for commodities that have already been identified and to look in the areas where they are already known to occur. For that reason, this assessment relied in large part on data derived from past exploration activity, including records of mining claims on federal lands and DOGAMI's digital mineral inventory database (Mineral Information Layer for Oregon [MILO]). Each county was rated for the potential for discovery or definition of a new mineral resource for each commodity using the classes and criteria listed below:

- *High potential:* There has been historical production or there are identified resources. At least one of the following criteria were met:
  - Significant historic or active production
  - Deposit with repeated surface and subsurface sampling data
  - Numerous areas with high density of MILO data points, or active and closed claims
- *Moderate potential:* Sufficient data exist that it is likely that additional assessment would discover or define a new mineral resource. At least two of the following criteria were met:
  - Areas with multiple MILO data points with positive sample/assay results
  - Areas with multiple active or closed claims
  - Areas with above background chemical data based on numerous points
- *Low potential:* Favorable geology and limited data suggest that additional exploration might discover a mineral resource. At least two of the following criteria were met:
  - Scattered MILO data points with or without positive assay results
  - Scattered active or closed claims
  - Scattered areas or data points with above-background chemical values
  - Well-mapped geology with known association with commodity
- *Present:* MILO contains at least one entry for the commodity in the county, but there are no additional data to suggest more widespread occurrence.
- *Not found:* There are no records of the occurrence of a commodity, in most instances because the geology does not host it, in fewer instances because of incomplete reporting.

To categorize each county, publicly available data, including papers, reports, digital maps, and databases, were assembled (see Sources and Appendix B). The collection included geologic maps, mineral occurrence records, claim and permit records, and geochemical sample data (see appendix for full list). Over the course of several days, a team of DOGAMI geologists reviewed all available data for each commodity on a county-by-county basis and assigned the appropriate mineral potential rating. **Table 2**, **Figure 2**, and Plate 1 show the results; the next section of this report contains commodity summaries.

Table 2. Mineral resource potential by county for selected commodities. Commodities are grouped into metallic ores and industrial minerals. Commodities in each group are listed in order of decreasing potential.

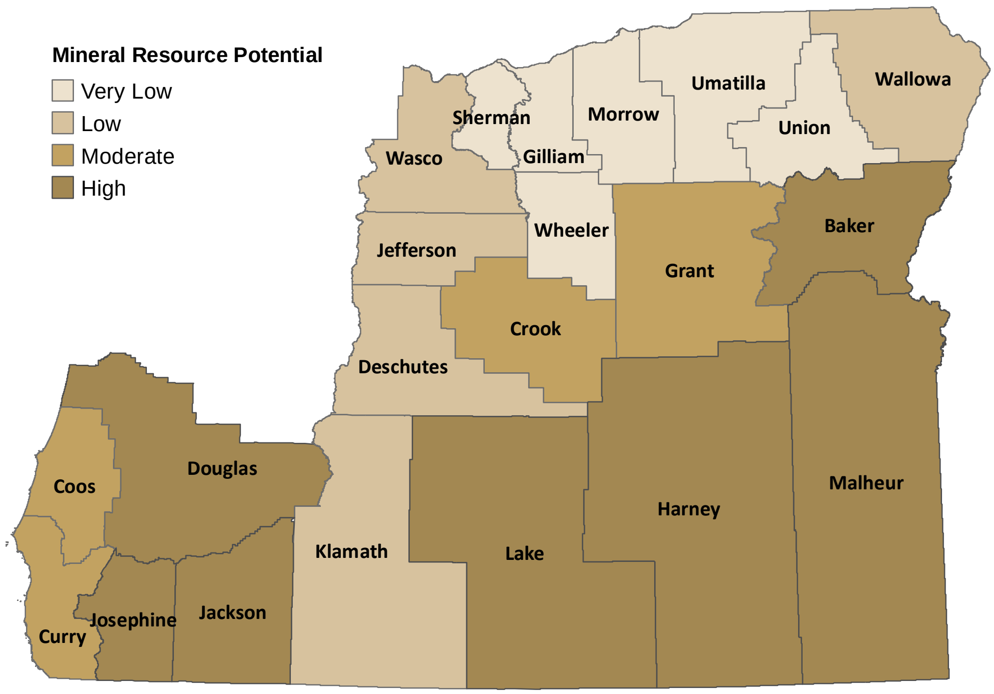
County	Metallic Minerals							Industrial Minerals							
	Precious Metals: Gold & Silver	Base Metals: Copper, Lead, & Zinc	Nickel	Chromite	Uranium	Platinum Group Metals	Lithium	Limestone	Bentonite	Diatomite	Zeolites	Silica	Pumice	Perlite	Sunstones
Baker	H	M	L	L	L	P	NF	H	M	L	M	NF	NF	M	NF
Coos	M	M	NF	H	NF	L	NF	P	NF	NF	NF	H	NF	NF	NF
Crook	H	L	NF	NF	M	NF	NF	P	H	L	L	NF	NF	NF	NF
Curry	H	H	H	M	P	L	NF	P	NF	NF	NF	L	NF	NF	NF
Deschutes	L	NF	NF	NF	NF	NF	NF	NF	NF	H	NF	NF	H	NF	NF
Douglas	H	H	H	M	NF	M	NF	L	NF	NF	NF	H	L	NF	NF
Gilliam	NF	NF	NF	NF	NF	NF	NF	NF	L	NF	NF	NF	P	NF	NF
Grant	H	H	L	H	P	L	NF	P	L	P	P	NF	NF	NF	NF
Harney	H	M	NF	NF	M	NF	M	P	M	H	H	NF	L	P	H
Jackson	H	M	L	M	L	P	NF	H	M	NF	NF	H	P	NF	NF
Jefferson	H	P	NF	P	NF	NF	NF	P	L	NF	NF	NF	NF	NF	NF
Josephine	H	H	H	H	P	M	NF	H	NF	NF	NF	P	NF	NF	NF
Klamath	NF	NF	NF	NF	NF	NF	NF	NF	L	M	NF	NF	H	P	NF
Lake	H	L	NF	NF	H	NF	L	P	P	H	L	P	P	H	H
Malheur	H	P	P	P	H	NF	H	P	H	H	H	L	L	L	L
Morrow	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	P	NF	NF	NF
Sherman	P	NF	NF	P	NF	NF	NF	NF	NF	NF	P	NF	NF	NF	NF
Umatilla	L	NF	NF	NF	P	NF	NF	NF	P	NF	NF	P	NF	L	NF
Union	M	P	NF	NF	P	P	NF	P	P	P	NF	NF	NF	P	NF
Wallowa	L	M	NF	NF	P	P	NF	H	NF	NF	NF	P	NF	NF	NF
Wasco	L	NF	NF	NF	NF	NF	NF	NF	H	NF	NF	NF	NF	L	NF
Wheeler	L	P	NF	P	P	NF	NF	P	L	L	L	NF	NF	NF	NF

Mineral Potential Key

High	H
Moderate	M
Low	L
Present	P
Not Found	NF

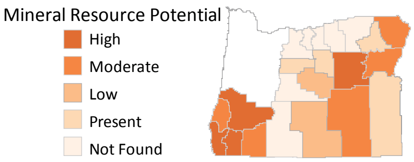
For the ratings criteria used to create this table, see the assessment methodology on page 7.

Figure 2. Summary map showing overall mineral resource potential for each county. Ratings are based on geological factors, expert knowledge, and data from mineral databases.



This statewide summary map shows an overall mineral potential rating for each county that combines the ratings for individual commodities in that county. To make the overall rating for each county, individual commodity ratings were assigned 3 points for High, 2 for Moderate, 1 for Low, and 0 for Present or Not Found, and the values were totaled. From these scores the counties on the large map were assigned a High, Moderate, Low, or Very Low overall resource potential. Note that a county with a Low or Moderate *overall* potential could rate High for an *individual* commodity.

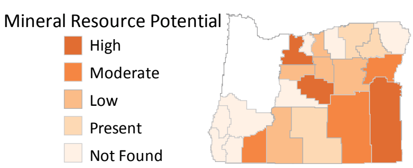
MINERAL RESOURCE POTENTIAL BY COMMODITY



Base Metals: Copper, Lead, and Zinc

Numerous base metal (e.g., copper, lead, and zinc) occurrences and deposits are found in Curry, Douglas, Grant, and Josephine counties and were initially recognized by early prospectors in their search for gold. These deposits are either small high-grade veins of lode ore or low-grade, large-volume ore bodies. Total Oregon production of these metals is relatively small by modern standards and most was a by-product of gold production. However, several deposits in southwestern and northeastern Oregon were mined primarily for base metals.

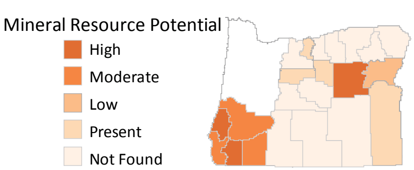
On the basis of historic production and the presence of numerous deposits and occurrences, Curry, Douglas, Grant, and Josephine counties have a High potential. The presence of known occurrences and favorable geology support a Moderate potential rating for Baker, Coos, Harney, Jackson, and Wallowa counties. Although many of the known deposits are small by modern standards, additional geochemical data, mineral and geologic mapping, and regional models of mineralization may identify larger systems, and some deposits may have high enough grade to warrant development despite their size. New or re-opened base metal mines may face significant challenges meeting modern environmental standards, as they typically generate acidic drainage.



Bentonite

Bentonite clay commonly occurs as the product of chemical weathering of volcanic ash in ancient lake environments, and favorable geology occurs in many parts of the study area. Bentonite has a wide range of uses including drilling mud, pet litter, waterproofing, feed additives, foundry sand, and iron ore processing. U.S. production over the last 5 years has ranged from 4.3 to nearly 5.0 million tons. There are two permitted mines, in Crook and Malheur counties, and an exploration permit for a location in Wasco County.

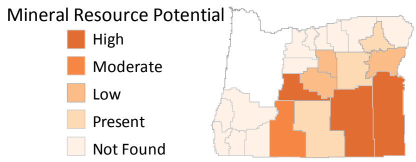
Oregon production during this period is unknown. Crook, Malheur, and Wasco counties have a High potential for defining new resources, and Baker, Harney, and Jackson counties have a Moderate potential. Detailed geologic mapping can help identify new occurrences, but existing Oregon mines appear to have significant reserves. Transportation costs are a significant factor, so the market may limit development of new mines.



Chromite

Chromite is a critical component of a range of specialty steel products and is used in the chemical industry and as a refractory. Chromite occurs in many locations in southwestern and northeastern Oregon, where the mineral occurs as small pods in ultramafic rocks. Oregon was the principal source of domestic chrome during both World Wars and for a stockpile program during the Korean conflict. Oregon's total production of over 127,000 tons comes from a scattering of relatively small mines in Josephine, Curry, and Grant counties. The rocks in which chromite is found in Oregon are typically severely deformed, making it difficult to identify large ore bodies or groups of ore bodies. Chromite is also concentrated in placer deposits and was mined for foundry sand briefly in Coos County between 2009 and 2013.

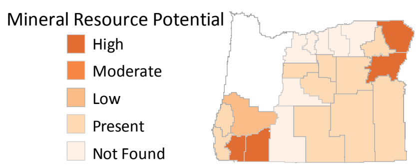
There are at least 250 known chromite occurrences and deposits in southwestern Oregon, which results in a High rating for Coos and Josephine counties and a Moderate rating for Curry, Douglas, and Jackson counties. At least 200 chromite occurrences and deposits are known in northeastern Oregon, leading to a High rating for Grant County and a Low rating for Baker County. Regional stream sediment data and imagery-based mineral mapping coupled with detailed geologic mapping could help identify new resources.



Diatomite

Diatomite consists of the fossil remains of microscopic plants and is used as a filter and inert filler. Diatomite is produced in the United States from mines in Oregon, Washington, Nevada, and California. Five mines are currently permitted in Oregon. There are no data available on Oregon's current diatomite production, but the USGS reported 1,000 tons in 2011. It is likely that total historic production substantially exceeds the 75,000 tons that have been reported. In addition to the actively producing or permitted mines in Oregon, there are a moderate number of permitted exploration sites. The geologic setting that hosts diatomite deposits is widespread in southeastern Oregon.

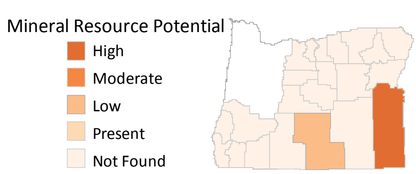
Deschutes, Harney, Lake, and Malheur counties have a High potential for discovery or definition of a new diatomite resource. Klamath County has a Moderate potential, and Baker, Crook, and Wheeler counties have favorable geology and a Low potential. Imagery-based mineral mapping and detailed geologic mapping may help identify new resources, but a major problem confronting the diatomite industry is high transportation costs and distance to market.



Limestone

Limestone is a sedimentary rock composed of the shells of marine organisms, and marble is limestone's metamorphosed equivalent. Both occur in many locations in southern and eastern Oregon. Limestone and marble are generally mined in very large quantities, so proximity to transportation corridors and markets is a critical factor. Limestone is currently mined at Durkee in Baker County, where it is processed onsite into cement. Other Oregon deposits may be suitable for agricultural purposes, paper manufacturing, and other industrial processes. The total historic production of ~ 2.75 million tons is certainly a very low estimate, as annual production data are available for only 20 of the last 60 years.

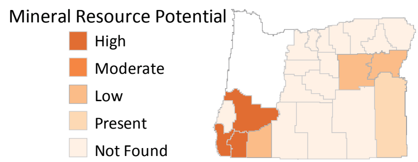
Baker, Jackson, Josephine, and Wallowa counties all have a High potential for a new limestone resource, and detailed geologic mapping could identify additional potential deposits. However, there are abundant known occurrences, and it is probably just as important to find new markets for known occurrences as it is to find new occurrences.



Lithium

Lithium is a commodity that is increasingly in demand, particularly to meet the demand for lithium-ion batteries to power a wide range of electronic devices including electric vehicles. Today, most of the world's lithium is produced from playa-lake brines in Chile, Argentina, and China, with some production from Nevada. Lithium has never been produced in Oregon, but there are significant deposits in the McDermitt area on the Oregon-Nevada border, with a mine in development on the Nevada side.

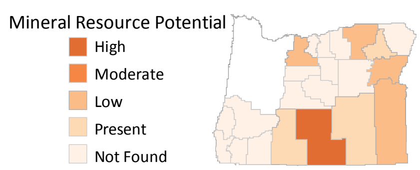
Malheur County has a High potential for lithium, based on the proximity of the McDermitt deposits in Nevada. There is also a Moderate potential in Harney County. Lake County is given a Low potential, because it contains numerous playa lakes, although there are few data on the lithium content of brines from any of these lakes. Additional geochemical sampling could help identify new lithium occurrences.



Nickel

Nickel is a critical component of a range of specialty steel products. Nickel occurs in southwestern Oregon in deeply weathered soils called laterites, formed on ultramafic rock. The Hanna nickel mine at Riddle in Douglas County operated from 1953 through 1987, producing 412,000 tons of ferronickel. During this time, it was the only nickel mine in the United States. Smelter operations at Riddle continued with imported ore until 1998.

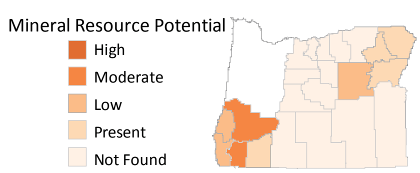
Another 20-nickel laterite occurrences are known from Curry and Josephine counties, and all three counties have a High potential for a new nickel resource. Baker, Grant, and Jackson counties all have a Low potential, based on scattered nickel occurrences. In both regions, nickel deposits occurrences are associated with severely deformed ultramafic rocks, which means that ore bodies tend to be small and discontinuous. Regional stream sediment data and imagery-based mineral mapping coupled with detailed geologic mapping could help identify groupings of potential ore bodies.



Perlite

Crude perlite is a form of volcanic glass that has a relatively high water content. When heated rapidly in a furnace, perlite puffs up to form a lightweight inert material marketed as a soil conditioner that improves aeration and water retention. Perlite is also sold as a filler and extender for a wide variety of construction and industrial products.

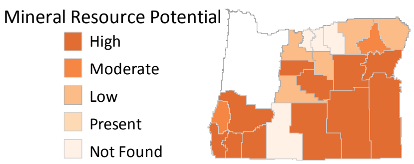
Perlite has been mined consistently in Lake County for many years and periodically in Baker County, giving these counties a High and a Moderate potential, respectively. However, few production data are available. Geologic settings that host perlite occurrences are also found in Malheur, Umatilla, and Wasco counties, giving them a Low potential for new mines. Detailed geologic mapping could help identify new perlite resources.



Platinum Group Metals

In Oregon, platinum, palladium, and rhenium (platinum group metals, PGM) have been reported as a secondary commodity in the mining of other metals. PGM occurrences have been observed in placer and lode deposits and in weathered ultramafic rocks in southwestern and northeastern Oregon. In most of the placers, the quantity and grade of PGM are such that they could not have been recovered economically alone and, typically, PGM were discarded. Total PGM production from southwestern Oregon placer deposits was reported as 1,500 oz. PGM concentrations in lode deposits and other occurrences are generally well below ore grade, and the bedrock sources for placer PGM deposits have not been identified.

Josephine County has a Moderate potential for PGM based on the number of identified placer occurrences. Douglas County is also rated Moderate based on elevated PGM values identified at the Hanna mine at Riddle. The distribution of PGM deposits in Oregon remains poorly understood, and known occurrences have low grades in comparison to other known deposits outside of the United States. Geochemical sampling in regions of a favorable geologic setting would help define the distribution and extent of PGM minerals within Oregon and might lead to the discovery or definition of a resource.



Precious Metals: Gold and Silver

Gold and silver are the most widely mined metallic minerals in Oregon, both in terms of the number of mines and the total value of production. Gold and silver are found in bedrock, either concentrated in veins of ore (lode) or as microscopic particles dispersed in large volumes of ore (disseminated). Fragments of free gold that have weathered out of lode deposits accumulate in stream sediments, forming placer deposits.

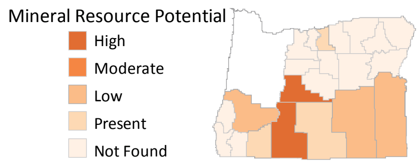
Rich placer deposits in Baker and Josephine counties spurred the early gold rush in Oregon and were the source for the majority of historical production. These deposits had relatively high concentrations of gold and could be mined relatively easily without underground workings. Lode gold deposits were worked with underground mining techniques in southwestern and northeastern Oregon until mining ceased during World War II. Few of these mines had deep extensive workings, and miners generally pursued ore veins without the exploratory drilling and resource assessment that is common for modern mines. Disseminated gold and silver occurrences, recognized in Oregon for the last 30 years, hold very large quantities of very low grade ore and are typically mined as open pits to keep production costs low. Numerous disseminated deposits were identified in southeastern Oregon in the 1980s, and exploration and development work is continuing. Grassy Mountain, near Vale in Malheur County, was one of the first to be discovered, and is now in the middle of a multi-year permitting process. The low grade of ore means that these mines are typically large-scale operations with high development costs.

Eleven of the 22 counties evaluated have a High potential for discovering or defining a new gold and silver resource, two have a Moderate potential, and five have a Low potential (see **Table 2**).

The vast majority of known gold mines in Oregon are relatively small lode gold or placer deposits, most of which are inactive and would require substantial investment to re-open. Unknown numbers of both types of deposit are being mined on a hobby or subsistence basis. Many placer deposits remain to be mined, but because placer deposits typically occur near streams, new mines will face competing land uses and significant costs in meeting modern environmental standards. Most remaining placer deposits are likely to be very small by modern gold mine standards, which may make them less attractive to medium- to large-size mining companies. New detailed geologic mapping may help identify new placer gold occurrences.

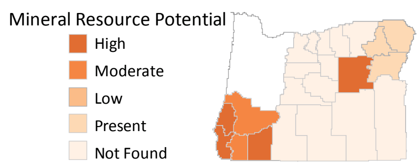
Most lode gold deposits in Oregon ceased production without exhausting their resources, and few were mined to any significant depth by modern standards. Modern geologists have a far more sophisticated understanding of the origin of lode gold deposits than the miners who first opened them. The application of modern exploration models and methods to these known deposits has significant potential for identifying new resources and for identifying more extensive mineralization systems that link smaller shallow deposits. It is likely that considerable lode gold and silver resources remain in these deposits, though development would require substantial investments in exploration and, in many areas, would face challenges in meeting modern environmental standards.

There is a significant potential for the discovery of new disseminated gold occurrences through a combination of new regional stream sediment sampling and imagery-based mineralogical mapping, followed by detailed geologic mapping. As with lode deposits, development of new ore system models for known occurrences or deposits may also help define significant resources.



Pumice

Pumice is a naturally occurring glass foam that forms during explosive volcanic eruptions. Pumice is relatively strong and inert and is an ideal aggregate material for lightweight building blocks and horticultural purposes. Lesser amounts are sold for absorbents, for landscaping, and as abrasives in a variety of industrial applications. Pumice has been mined from several sites in Deschutes and Klamath counties, and production has averaged ~500,000 tons per year for the 31 years for which production data are available. The last year for which production data were reported is 1994, so the current state of Oregon's pumice mines is unknown. Deschutes and Klamath counties have a High potential for pumice mines; however, pumice has significant transportation costs, and existing mines may be adequate to satisfy the current markets.

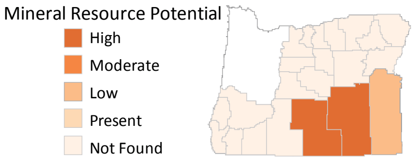


Silica

Silica has various uses including colored container glass, nickel smelting, ferrosilicon production, filter bed media, and decorative rock and composite applications. Silica deposits in Oregon are the result of concentration by weathering and erosion or deposition by hydrothermal fluids.

Within the study area, Coos, Douglas, and Jackson counties have a High potential for commercial quantities of silica. The Quartz Mountain deposit in Douglas County was mined for many years to provide silica for the smelter at the Hanna nickel mine and has reserves estimated in excess of 100 million tons. The Bristol Silica and Limestone Company deposit located in Jackson County mined silica until recently and has reserves estimated at 12 million tons. Both deposits were mined at surface using conventional crushing equipment, but neither is currently active. A considerable silica resource could be produced from these deposits if the right markets could be identified. Silica has been mined from dune sand at the Coos Sand operation in Coos County, but the mine has been inactive for many years.

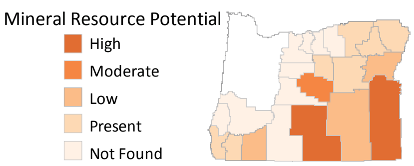
Imagery-based mineral mapping may help identify new resources, and further characterization of the chemistry of silica deposits could help to identify new markets. The lack of a local industrial market and significant transportation costs are both barriers to large-scale mine development.



Sunstones

Oregon Sunstones are a form of plagioclase feldspar, which is a mineral that is a common constituent of volcanic rocks. Sunstones are large, clear, come in a wide range of colors, and can be cut into gemstones of considerable size and value. There are currently no permitted mines in Oregon, although several small mines operate at levels that have not required either a permit or an exclusion certificate until this year. There are no data on U.S., Oregon, or global sunstone production. Synthetic sunstones and stones sourced from south Asia may compete with natural stones mined in Oregon.

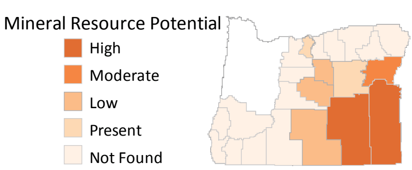
Harney and Lake counties both have a High potential, based on the presence of active mines, and Malheur County has a Low potential, based on a few occurrences. Other counties may have a potential, but the geologic setting in which sunstones form is not clear, which makes exploration for new occurrences difficult. A study of the geologic setting in which the gemstone occurs could identify new resources, though the size of the market for specialty gemstones may be a limiting factor.



Uranium

Uranium deposits occur at several locations in the study area, primarily concentrated by low-temperature geothermal fluids in volcanic rocks. The most important deposits are at the White King and Lucky Lass mines near Lakeview and near McDermitt on the Oregon-Nevada border. The White King and Lucky Lass were mined underground and at the surface from 1955 and 1965, respectively, and together produced 6,200 tons of uranium oxide. The deposit at McDermitt has been extensively studied and explored, most recently by Oregon Energy, LLC, which considered starting the DOGAMI permitting process but ultimately decided not to proceed. The Oregon portion of the McDermitt ore body is estimated to contain more than 17 million tons of uranium reserves averaging 0.05% uranium oxide. Uranium occurrences are also known in Crook and Harney counties.

Based on the known uranium deposits there, Lake and Malheur counties have a High potential. Crook and Harney counties have a Moderate potential based on the presence of several occurrences. The relatively low current price of uranium and environmental issues are some of the many challenges to the development of a new resource.



Zeolites

Zeolites are porous minerals that are used primarily in animal feed, odor control, water purification, wastewater treatment, and pet litter. Zeolites in Oregon form in ancient lake environments where there is abundant volcanic ash and are often found in the same areas as bentonite and diatomite. There are two permitted mines in Oregon, in Harney and Malheur counties; both counties accordingly have a High potential. Baker County has a Moderate potential. Imagery-based mineral mapping and detailed geologic mapping can help identify new occurrences, but existing Oregon mines appear to have significant reserves. Transportation costs are a significant factor, so the market may limit development of new resources.

RECOMMENDATIONS FOR CONTINUED MINERAL RESOURCE POTENTIAL ASSESSMENT ACTIVITIES

HB 3089 Section 1 (5)
Mining operations should be encouraged and supported in eastern Oregon as a means for residents and communities to improve their economies and well-being

ORS 516.030 (1)
The State Department of Geology and Mineral Industries shall initiate and conduct studies and surveys of the geological and mineral resources of the state and their commercial utility

These recommendations are based on the language of HB 3089 and DOGAMI statute cited above. The purpose of these recommendations is to encourage and support mining operations by providing new regional data that describe the geologic favorability of Oregon with increased accuracy and detail. Compiling and collecting data and carrying out studies would:

- Help define the extent and grade of known mineral deposits
- Help locate previously unknown mineral deposits

Recommendations 1–5 outline a state-of-practice regional mineral exploration program. The program starts by collecting all existing data, then adds regional mineral and chemical datasets to target detailed geologic mapping, and then develops new conceptual models for mineralization. We envision these activities being carried out in sequence over a period of several biennia.

Recommendation 6 would provide technically sound and regionally specific reference material to support small miners.

The cost estimates are based on the assumption that DOGAMI would shift existing staff geologists from Federal or Other-funded projects using new General funds. General cost estimates are provided with each recommendation below, and detailed budgets are included in Appendix A.

For some commodities like gemstones, landscape rock, and industrial minerals, a thorough market analysis and marketing or branding campaign might support the development of new mines in Oregon. This kind of analysis is outside the expertise of DOGAMI, so we offer no specific recommendations for this work.

Recommendation 1: Comprehensive Integrated Mineral Geodatabase

Purpose

Support mineral exploration in Oregon by creating a comprehensive digital geodatabase of mining information. Making legacy mineral information available in a modern digital format is the most cost-effective first step in a comprehensive mineral resource evaluation program.

How Achieved

DOGAMI maintains mining information databases (Mineral Information Layer for Oregon [MILO] and Geochemical Information Layer for Oregon [GILO]) based on published reports and U.S. Bureau of Mines and U.S. Geological Survey records. This information is often incomplete and poorly located and needs to be edited, updated, and georeferenced using modern lidar and orthophoto imagery. In addition, DOGAMI holds legacy mine reports, maps, and claim records dating back to the 1800s, and records of over 30,000 chemical assays that the department performed as a free service between 1937 and 1970. These legacy data would be merged with the existing MILO and GILO databases, so that every piece of information that is available about a particular mine would be available in a single geodatabase and would be located as accurately as possible. This geodatabase would represent a large new information resource, which would potentially attract new exploration to the state. Upon completion, DOGAMI would publish the new geodatabase online and host a symposium to present the new data to the public. DOGAMI staff would also present the data at annual meetings of the American Exploration and Mining Association (AEMA).

Estimated Costs

The estimated costs for this activity are ~$635,000 in new General Fund revenue to cover staff salary and travel.

Recommendation 2: Regional Exploration Data Collection

Purpose

Collect new comprehensive mineral pathfinder element data and remotely sensed mineral composition maps for High and Moderate potential counties to better understand known mineral deposits and to identify new deposits.

How Achieved

"Pathfinder" elements like mercury and arsenic are deposited by the same processes that create gold deposits but are more widely distributed and easier to detect. Sampling stream sediment for chemical analyses to determine the abundance of these elements is a proven method for cheaply identifying potential mineral occurrences over large areas. This activity would provide complete coverage of pathfinder sampling at the 6th field watershed level for all counties with High and Moderate potential for metals. DOGAMI staff would collect samples at carefully chosen locations, and the samples would be analyzed through a commercial laboratory. The resulting data would be used to produce a regional map of geochemical values that identify potential mineral deposits.

Publicly available multispectral satellite imagery would be processed to highlight areas of rock or mineral composition that may be associated with mineral deposits. There are well-established methods to process this type of data to highlight mineral features of interest to exploration geologists, and consistent region wide models may highlight areas for new prospecting and exploration. Remote sensing technology greatly increases coverage and accuracy particularly in more inaccessible areas, the result of which is reduced exploration costs and time. Upon completion, DOGAMI would publish all results via free online distribution and host a symposium to present the new data to the public. DOGAMI staff would also present the data at annual meetings of the AEMA.

Estimated Costs

The estimated costs for this activity are ~$682,000 in new General fund revenue to cover staff salary, travel for fieldwork, and contracted analytical services.

Recommendation 3: Targeted Geologic Mapping

Purpose

Provide new detailed geologic maps in areas of mineral potential to support exploration activity.

How Achieved

Geologic mapping at a scale of 2,000 feet to the inch or better is essential to identify geologic environments that might host mineral deposits. Over the entire southern and eastern Oregon study area this quality of mapping is available for only about 20% of the area. New geologic mapping, targeted with the results from the recommendation 1 and 2 studies, would support new exploration. Upon completion, DOGAMI would publish the new mapping via free online distribution. DOGAMI staff would also present the data at annual meetings of the AEMA.

Estimated Costs

The estimated costs for this activity are ~$694,000 in new General fund revenue to cover staff salary, travel for fieldwork, and contracted analytical services.

Recommendation 4: Ore System Models

Purpose

Provide modern ore genesis models for Oregon precious metal and base metal districts.

How Achieved

Most Oregon lode mines and mining districts were developed in the late nineteenth and early twentieth centuries, without the benefit of modern geologic and geochemical assessments of the mechanism of metal ore development, which is a key factor in exploring for additional resources in known districts. This project would build on data developed in recommendation 1 to create state-of-practice ore system models for key Oregon mining districts to stimulate and guide renewed exploration activity. Upon completion, DOGAMI would publish all results via free online distribution and host a symposium to present the new data to the public. DOGAMI staff would also present the data at annual meetings of the AEMA.

Estimated Costs

The estimated costs for this activity are ~$313,000 in new General fund revenue to cover staff salary, travel for fieldwork, and contracted analytical services.

Recommendation 5: Sunstone Study

Purpose

Understand the geologic setting of Oregon sunstone deposits in order to encourage exploration.

How Achieved

Oregon sunstones are relatively unique and high-value gemstones produced from several mines in southeastern Oregon. There is no geologic consensus on the geologic environment that supports the deposits, which makes it difficult to explore for new deposits. A detailed geologic evaluation of known mines and deposits would define the geologic setting of the deposits and encourage new exploration. Upon completion, DOGAMI would publish all results via free online distribution. DOGAMI staff would also present the data at annual meetings of the AEMA.

Estimated Costs

The estimated costs for this activity are ~$139,000 in new General fund revenue to cover staff salary, travel for fieldwork, and contracted analytical services.

Recommendation 6: Technical Resource Guide for Small Mining Operations

Purpose

Provide a technical reference document for individual and small business mine owners to help them safely and profitably develop existing mines.

How Achieved

Many once-profitable mines in Oregon are owned and operated by individuals or small companies that may not have the necessary technical expertise to rehabilitate or develop these properties. Department staff would collect relevant materials from other states and other Oregon agencies to produce and publish a simple guide to mine evaluation, development, permitting, and operation. Upon completion, DOGAMI would publish all results via free online distribution and host a symposium to present the new data to the public.

Estimated Costs

The estimated costs for this activity are ~$138,000 in new General fund revenue to cover staff salary.

ACKNOWLEDGMENTS

We gratefully acknowledge Mark Ferns, DOGAMI (retired); John Dilles, Oregon State University; and Vicki McConnell, Executive Director, Geological Society of America, who reviewed this paper, as well as Jon Franczyk, DOGAMI cartographer; Deb Schueller, DOGAMI Publications Coordinator; and Ali-Ryan Hansen, DOGAMI communications director.

SOURCES

The following data sources along with published DOGAMI reports and maps (see Appendix B) were used to generate this report and map plate:

Land and Mineral Legacy Rehost System (LR2000), U.S. Department of the Interior, Bureau of Land Management
http://www.blm.gov/lr2000/

The Legacy Rehost System called LR2000 provides reports on BLM land and mineral use authorizations for oil, gas, and geothermal leasing, rights-of-ways, coal and other mineral development, land and mineral title, mining claims, withdrawals, classifications, and more on federal lands or on federal mineral estate.

Prospect- and Mine-Related Features from U.S. Geological Survey 7.5- and 15-Minute Topographic Quadrangle Maps of the Western United States, U.S. Geological Survey
https://www.sciencebase.gov/catalog/item/57962314e4b007df0739fede

Mineral Resources of the Sagebrush Focal Areas of Idaho, Montana, Nevada, Oregon, Utah, and Wyoming, W. C. Day, T. P. Frost, J. M. Hammarstrom, and M. L. Zientek (eds.), U.S. Geological Survey Scientific Investigations Report 2016–5089, 2016**.**
http://dx.doi.org/10.3133/sir20165089

Guide to preparation of mineral survey reports on public lands, compiled by G. H. Goudarzi (compiler), U.S. Geological Survey Open-File Report 84-787, 1984.
http://pubs.usgs.gov/of/1984/0787/report.pdf

Mineral Information Layer for Oregon (MILO) - release 2, DOGAMI
http://www.oregongeology.org/sub/milo/ohmi.htm - online map;
http://www.oregongeology.org/pubs/dds/p-MILO-2.htm - data download

MILO-2 is a geospatial database that stores and manages information regarding Oregon's mineral occurrences, prospects, and mines.

Oregon Geologic Data Compilation (OGDC), DOGAMI
http://www.oregongeology.org/pubs/dds/p-OGDC-6.htm - data download

OGDC is a statewide compilation of geologic data created by the Oregon Department of Geology and Mineral Industries (DOGAMI). The purpose of the compilation is to integrate and make available the best known geologic mapping for the state by combining maps and data into a single digital database. Sources of geologic mapping include state and federal agencies, student thesis work, and consultants.

APPENDIX A: PROJECTED BUDGETS FOR RECOMMENDED MINERAL RESOURCE POTENTIAL ASSESSMENT ACTIVITIES

Recommendation 1: Comprehensive Integrated Mineral Geodatabase			
Budget Category	**Total Months**	**Per month**	**State Matching Funds Proposed**
Staff Labor (rates are per month)			
Chief Scientist	1.0	$ 7,650	$7,650
NRS 4: Regional Geologist	24.0	$ 5,800	$139,190
NRS 3: Geologist	24.0	$ 5,483	$131,592
Technical Editor	2.0	$ 6,028	$12,056
Sub-total DOGAMI Salary:			**$290,488**
Average Fringe Rate	Standard Variable and Fixed Cost Benefits	51.0%	$148,149
University Student Assistant (rate per hour)	4320.0	12.13	$52,402
Student Fringe Benefits (SSA, WC)	Standard Variable and Fixed Cost Benefits	8.0%	$4,192
Sub-total Salary:			**$342,890**
Sub-total Fringe Benefits:			**$152,341**
Total Personnel Costs:			***$495,231***
Services & Supplies			
Travel:			
Per Diem (2 meetings, 4 days each)			$1,120
Airfare: $500 per meeting			$1,000
Meeting Registration: $500 per meeting			$1,000
Sub-total Travel:			***$3,120***
Total Services & Supplies:			***$3,120***
Total Direct Costs			**$498,351**
Indirect Costs	**Ceiling IC rate (actual is 27.40%)**	27.40%	$136,548
Total Cost of Recommendation 1			**$634,899**

Recommendation 2: Regional Exploration Data Collection			
Budget Category	**Total Months**	**Per month**	**State Matching Funds Proposed**
Staff Labor (rates are per month)			
Chief Scientist	1.0	$ 7,650	$7,650
NRS 4: Regional Geologist	24.0	$ 5,800	$139,190
NRS 3: Geologist	24.0	$ 5,483	$131,592
Technical Editor	2.0	$ 6,028	$12,056
Sub-total Salary:			**$290,488**
Average Fringe Rate	Standard Variable and Fixed Cost Benefits	51.0%	$148,149
Total Personnel Costs:			**$438,637**
Services & Supplies			
Travel			
Per Diem (2 meetings, 4 days each)			$1,120
Airfare: $500 per meeting			$1,000
Meeting Registration: $500 per meeting			$1,000
Per Diem (300 days @ $140/day)			$42,000
Motorpool Car Rental for 18 months @ $113/ month			$2,034
Motorpool fuel: 30k miles @ 20 miles/ gallon @ $3/ gallon			$4,500
Sub-total Travel:			***$51,654***
Contracts			
XRF analyses (1500 @ $30 each)			$45,000
Sub-total Contract:			***$45,000***
Total Services & Supplies:			**$96,654**
Total Direct Costs			**$535,291**
Indirect Costs	**Ceiling IC rate (actual is 27.40%)**	27.40%	$146,670
Total Cost of Recommendation 2			**$681,961**

Recommendation 3: Targeted Geologic Mapping			
Budget Category	**Total Months**	**Per month**	**State Matching Funds Proposed**
Staff Labor (rates are per month)			
Chief Scientist	1.0	$ 7,650	$7,650
NRS 4: Regional Geologist	24.0	$ 5,800	$139,190
NRS 3: Geologist	24.0	$ 5,483	$131,592
GIS Analyst/Cartographer - John Bauer	4.0	$ 4,660	$18,640
Technical Editor	2.0	$ 6,028	$12,056
Sub-total Salary:			**$309,128**
Average Fringe Rate	Standard Variable and Fixed Cost Benefits	51.0%	$157,655
Total Personnel Costs:			**$466,783**
Services & Supplies			
Travel			
Per Diem (2 meetings, 4 days each)			$1,120
Airfare: $500 per meeting			$1,000
Meeting Registration: $500 per meeting			$1,000
Per Diem (150 days @ $140/day)			$21,000
Motorpool Car Rental for 18 months @ $113/ month			$2,034
Motorpool fuel: 30k miles @ 20 miles/ gallon @ $3/ gallon			$4,500
Sub-total Travel:			***$30,654***
Contracts			
Thin sections (200 @ $25 each)			$5,000
XRF analyses (300 @ $60 each)			$18,000
Ar/Ar age dates (24 @ $1,000 each)			$24,000
Sub-total Contract:			***$47,000***
Total Services & Supplies:			**$77,654**
Total Direct Costs			**$544,437**
Indirect Costs	**Ceiling IC rate (actual is 27.40%)**	27.40%	$149,176
Total Cost of Recommendation 3			**$693,613**

Recommendation 4: Ore System Models			
Budget Category	**Total Months**	**Per month**	**State Matching Funds Proposed**
Staff Labor (rates are per month)			
Chief Scientist	0.50	$ 7,650	$3,825
NRS 4: Regional Geologist	24.0	$ 5,800	$139,190
Technical Editor	1.0	$ 6,028	$6,028
Sub-total Salary:			**$149,043**
Average Fringe Rate	Standard Variable and Fixed Cost Benefits	51.0%	$76,012
Total Personnel Costs:			**$225,055**
Services & Supplies			
Travel			
Per Diem (2 meetings, 4 days each)			$1,120
Airfare: $500 per meeting			$1,000
Meeting Registration: $500 per meeting			$1,000
Per Diem (50 days @ $140/day)			$7,000
Motorpool Car Rental for 6 months @ $113/ month			$678
Motorpool fuel: 5k miles @ 20 miles/ gallon @ $3/ gallon			$750
Sub-total Travel:			***$11,548***
Contracts			
Thin sections (50 @ $25 each)			$1,250
XRF analyses (50 @ $60 each)			$3,000
Ar/Ar age dates (5 @ $1,000 each)			$5,000
Sub-total Contract:			***$9,250***
Total Services & Supplies:			**$20,798**
Total Direct Costs			**$245,853**
Indirect Costs	**Ceiling IC rate (actual is 27.40%)**	27.40%	$67,364
Total Cost of Recommendation 5			**$313,217**

Recommendation 5: Sunstone Study			
Budget Category	**Total Months**	**Per month**	**State Matching Funds Proposed**
Staff Labor (rates are per month)			
Chief Scientist	0.25	$ 7,650	$1,913
NRS 4: Regional Geologist	6.0	$ 5,800	$34,798
NRS 3: Geologist	4.0	$ 5,483	$21,932
Technical Editor	1.0	$ 6,028	$6,028
Sub-total Salary:			**$64,670**
Average Fringe Rate	Standard Variable and Fixed Cost Benefits	51.0%	$32,982
Total Personnel Costs:			**$97,652**
Services & Supplies			
Travel			
Per Diem (2 meetings, 4 days each)			$1,120
Airfare: $500 per meeting			$1,000
Meeting Registration: $500 per meeting			$1,000
Per Diem (30 days @ $140/day)			$4,200
Motorpool Car Rental for 18 months @ $113/ month			$226
Motorpool fuel: 3k miles @ 20 miles/ gallon @ $3/ gallon			$450
Sub-total Travel:			***$7,996***
Contracts			
Thin sections (20 @ $25 each)			$500
XRF analyses (20 @ $60 each)			$1,200
Ar/Ar age dates (2 @ $1,000 each)			$2,000
Sub-total Contract:			***$3,700***
Total Services & Supplies:			**$11,696**
Total Direct Costs			**$109,348**
Indirect Costs	**Ceiling IC rate (actual is 27.40%)**	27.40%	$29,961
Total Cost of Recommendation 4			**$139,309**

Recommendation 6: Technical Resource Guide for Small Mining Operations			
Budget Category	**Total Months**	**Per month**	**State Matching Funds Proposed**
Staff Labor (rates are per month)			
Chief Scientist	0.10	$ 7,650	$765
NRS 4: Regional Geologist	6.0	$ 5,800	$34,798
Technical Editor	6.0	$ 6,028	$36,168
Sub-total Salary:			**$71,731**
Average Fringe Rate	Standard Variable and Fixed Cost Benefits	51.0%	$36,583
Total Personnel Costs:			**$108,313**
Total Direct Costs			**$108,313**
Indirect Costs	**Ceiling IC rate (actual is 27.40%)**	27.40%	$29,678
Total Cost of Recommendation 6			**$137,991**

APPENDIX B: RELEVANT PUBLISHED MINERAL INVENTORIES AND STUDIES PREVIOUSLY COMPLETED BY DOGAMI

This list includes relevant published DOGAMI mineral inventories and studies. It is not a complete publication list. For all DOGAMI publications, visit the DOGAMI Publications Center, Links here will take readers to PDF or .zip formatted files or to web pages.

Bulletins

B-003	1938	The geology of part of the Wallowa Mountains, by C. P. Ross.
B-004	1938	Quicksilver in Oregon, by C. N. Schuette.
B-005	1938	Geological report on part of the Clarno Basin, Wheeler and Wasco Counties, Oregon, by Donald K. Mackay.
B-006	1938	Preliminary report of some of the refractory clays of western Oregon, by Hewitt Wilson and Ray C. Treasher.
B-007	1938	The gem minerals of Oregon, by Dr. H. C. Dake.
B-008	1938	An investigation of the feasibility of a steel plant in the Lower Columbia River area near Portland, Oregon, by Raymond M. Miller.
B-009	1938	Chromite deposits in Oregon, by John Eliot Allen, H.F. Byram, and F.W. Lee.
B-010	1938	Placer mining on the Rogue River, Oregon, in its relation to the fish and fishing in that stream, by Henry Baldwin Ward.
B-011	1938	The geology and mineral resources of Lane County, Oregon, by Warren Du Pre Smith and Lloyd L. Ruff.
B-012	1941	Geology and physiography of the northern Wallowa Mountains, by Warren Du Pre Smith, John Eliot Allen, Lloyd W. Staples, and Wayne R. Lowell.
B-014A	1939	Oregon metal mines handbook, northeastern Oregon - East half.
B-014B	1941	Oregon metal mines handbook, northeastern Oregon - West half.
B-014C vol. 1	1940	Oregon metal mines handbook, volume 1; Coos, Curry, and Douglas Counties.
B-014C vol. 2A	1942	Oregon metal mines handbook, volume 2; section A, Josephine County.
B-014C vol. 2B	1942	Oregon metal mines handbook, volume 2; section B, Jackson County.
B-014D	1951	Oregon metal mines handbook, northwestern Oregon.
B-015	1939	Geology of the Salem Hills and the North Santiam River basin, Oregon, by Thomas Prence Thayer.
B-016	1940	Field identification of minerals for Oregon prospectors and collectors, by Ray C. Treasher.
B-017	1942	Manganese in Oregon, by F. W. Libbey, John Eliot Allen, Ray C. Treasher, and H. K. Lancaster.
B-019	1939	Dredging of farmland in Oregon, by F. W. Libbey.
B-020	1940	Analyses and other properties of Oregon coals as related to their utilization, by H.F. Yancey and M. R. Geer.
B-023	1942	An investigation of the reported occurrence of tin at Juniper Ridge, Oregon, by H. C. Harrison and John Eliot Allen.
B-024	1943	Origin of the black sands of the coast of southwest Oregon, by W. H. Twenhofel.
B-025	1943	Third biennial report of the State Department of Geology and Mineral Industries of the State of Oregon, 1941-1942, by W. H. Strayer, Albert Burch, and E.B. MacNaughton.
B-026	1944	Soil: the most valuable mineral resource. Its origin, destruction, and preservation, by W. H. Twenhofel.
B-027	1944	Geology and coal resources of the Coos Bay quadrangle, Oregon, by John Eliot Allen and Ewart M. Baldwin.
B-029	1945	Ferruginous bauxite deposits in northwestern Oregon, by F. W. Libbey, Wallace D. Lowry, and Ralph S. Mason.
B-030	1946	Mineralogical and physical composition of the sands of the Oregon coast from Coos Bay to the mouth of the Columbia River, by W. H. Twenhofel.
B-031	1946	Geology of the St. Helens quadrangle, Oregon, by W. D. Wilkinson, Wallace D. Lowry, and Ewart M. Baldwin.
B-033	1947	Bibliography of the geology and mineral resources of Oregon: first supplement, July 1, 1936 to December 31, 1945, by compiled by John Eliot Allen, with contributions by Elinor Kinsley, Hazel Quasdorf, and Ray C. Treasher.

B-034 1947 Mines and prospects of the Mount Reuben mining district, Josephine County, Oregon, by Elton A. Youngberg.

B-035 1947 Geology of the Dallas and Valsetz quadrangles, Oregon, by Ewart M. Baldwin.

B-037 1953 Geology of the Albany quadrangle, Oregon, by Ira S. Allison.

B-039 1948 Geology and mineralization of the Morning Mine and adjacent region, Grant County, Oregon, by Rhesa M. Allen, Jr.

B-040 1949 Preliminary description of the geology of the Kerby quadrangle, Oregon, by Francis G. Wells, Preston E. Hotz, and Fred W. Cater, Jr.

B-042 1950 Seventh biennial report of the State Department of Geology and Mineral Industries of the State of Oregon, 1948-1950, by Niel R. Allen, H. E. Hendryx, and Mason L. Bingham.

B-043 1952 Eighth biennial report of the State Department of Geology and Mineral Industries of the State of Oregon, 1950-1952, by Mason L. Bingham, H. E. Hendryx, and Niel R. Allen.

B-044 1953 Bibliography of the Geology and mineral resources of Oregon: Second Supplement, January 1, 1946 to December 31, 1950, by Margaret L. Steere.

B-045 1954 Ninth biennial report of the State Department of Geology and Mineral Industries of the State of Oregon, 1952-1954, by Mason L. Bingham, Niel R. Allen, and Austin Dunn.

B-046 1956 Ferruginous bauxite deposits in the Salem Hills, Marion County, Oregon, by Raymond E. Corcoran and F.W. Libbey.

B-047 1956 Tenth biennial report of the State Department of Geology and Mineral Industries of the State of Oregon, 1954-1956, by Mason L. Bingham, Niel R. Allen, and Austin Dunn.

B-049 1959 Lode mines of the central part of the Granite mining district, Grant County, Oregon, by George S. Koch, Jr.

B-050 1959 Field guidebook: geologic trips along Oregon highways, by W. D. Wilkinson.

B-051 1960 Twelfth biennial report of the State Department of Geology and Mineral Industries of the State of Oregon, 1958-1960, by William Kennedy, Harold Banta and Earl S. Mollard.

B-052 1961 Chromite in southwestern Oregon, by Len Ramp.

B-053 1962 Bibliography of the Geology and mineral resources of Oregon: Third Supplement, January 1, 1951 to December 31, 1955, by Margaret L. Steere and Lillian F. Owen.

B-054 1963 Thirteenth biennial report of the State Department of Geology and Mineral Industries of the State of Oregon, 1960-1962, by Frank C. McColloch, Harold Banta and Fayette I. Bristol.

B-055 1963 Quicksilver in Oregon, by Howard C. Brooks.

B-057 1965 State of Oregon Lunar Geological Field Conference Guide Book, by Norman V. Peterson, Edward A. Groh and C. J. Newhouse.

B-058 1965 Geology of the Suplee-Izee area: Crook, Grant, and Harney Counties, Oregon, by William R. Dickinson and Lawrence W. Vigrass.

B-060 1967 Engineering geology of the Tualatin Valley region, Oregon, by Herbert G. Schlicker, Robert J. Deacon and Cornelius J. Newhouse.

B-061 1968 Gold and silver in Oregon, by Howard C. Brooks and Len Ramp.

B-062 1968 Andesite Conference Guidebook, by Hollis M. Dole and Cornelius J. Newhouse.

B-064 1969 Mineral and water resources of Oregon, by A. E. Weissenhorn, ed.

B-065 1969 Proceedings of the Andesite Conference, by Alexander R. McBirney, ed.

B-066 1970 The reconnaissance geology and mineral resources of eastern Klamath County and western Lake County, Oregon, by Norman V. Peterson and James R. McIntyre.

B-067 1970 Bibliography of the Geology and mineral resources of Oregon: Fourth Supplement, January 1, 1956 to December 31, 1960, by Miriam Roberts.

B-068 1970 Seventeenth biennial report of the State Department of Geology and Mineral Industries of the State of Oregon, 1968-1970, by Fayette I. Bristol, R. W. deWeese and Harold Banta.

B-069 1971 Geology of the southwestern Oregon coast west of the 124th Meridian, by R. H. Dott, Jr.

B-070 1971 Geologic formations of western Oregon, by John D. Beaulieu.

B-071 1971 Geology of selected lava tubes in the Bend area, Oregon, by Ronald Greeley.

B-072 1971 Bedrock geology of the Mitchell quadrangle, Wheeler County, Oregon, by Keith F. Oles and Harold E. Enlows.

B-073 1972 Geologic formations of eastern Oregon (east of longitude 121 degrees 30 minutes), by John D. Beaulieu.

B-074 1972 Environmental geology of the coastal region of Tillamook and Clatsop counties, Oregon, by Herbert G. Schlicker, Robert J. Deacon, John D. Beaulieu, and Gordon W. Olcott.

B-075 1972 Geology and mineral resources of Douglas County, Oregon, by Len Ramp.

B-076 1972 Eighteenth biennial report of the State Department of Geology and Mineral Industries of the State of Oregon, 1970-1972, by R. W. deWeese, William E. Miller and Donald G. McGregor.

B-077 1973 Geologic field trips in northern Oregon and southern Washington, by John D. Beaulieu.

B-078 1973 Bibliography of the Geology and mineral resources of Oregon: Fifth Supplement, January 1, 1961 to December 31, 1970, by compiled by Miriam S. Roberts, Margaret L. Steere and Caroline S. Brookhyser.

B-079 1973 Environmental geology of inland Tillamook and Clatsop Counties, Oregon, by John D. Beaulieu.

B-080 1973 Geology and mineral resources of Coos County, Oregon, by Ewart M. Baldwin, John D. Beaulieu, Len Ramp, Jerry J. Gray, Vernon C. Newton and Ralph S. Mason.

B-081 1973 Environmental geology of Lincoln County, Oregon, by Herbert G. Schlicker, Robert J. Deacon, Gordon W. Olcott and John D. Beaulieu.

B-082 1974 Geologic hazards of the Bull Run watershed, Multnomah and Clackamas Counties, Oregon, by John D. Beaulieu.

B-083 1974 Eocene stratigraphy of southwestern Oregon, by Ewart M. Baldwin.

B-084 1974 Environmental geology of western Linn County, Oregon, by John D. Beaulieu, Paul W. Hughes and Kent Mathiot.

B-085 1974 Environmental geology of coastal Lane County, Oregon, by Herbert G. Schlicker, Robert J. Deacon, R. C. Newcomb and R. L. Jackson.

B-086 1974 Nineteenth biennial report of the State of Oregon Department of Geology and Mineral Industries, 1972-1974, by R. W. deWeese, William E. Miller and H. Lyle Van Gordon.

B-087 1975 Environmental geology of western Coos and Douglas Counties, Oregon, by John D. Beaulieu and Paul W. Hughes.

B-088 1975 Geology and mineral resources of the upper Chetco drainage area, Oregon, including the Kalmiopsis Wilderness and Big Craggies botanical areas, by Len Ramp.

B-089 1976 Geology and mineral resources of Deschutes County, Oregon, by Norman V. Peterson, Edward A. Groh, Edward M. Taylor, and Donald E. Stensland.

B-090 1976 Land-use geology of western Curry County, Oregon, by John D. Beaulieu and Paul W. Hughes.

B-091 1977 Geologic hazards of parts of northern Hood River, Wasco, and Sherman Counties, Oregon, by John D. Beaulieu.

B-092 1977 Fossils in Oregon: A collection of reprints from the Ore Bin, by Margaret L. Steere, ed.

B-093 1977 Geology, mineral resources and rock material of Curry County, Oregon, by Len Ramp, Herbert G. Schlicker, and Jerry J. Gray.

B-094 1977 Land use geology of central Jackson County, Oregon, by John D. Beaulieu and Paul W. Hughes.

B-095 1977 North American ophiolites, by R. G. Coleman and W. Irwin (eds.).

B-096 1977 Magma genesis, 1977: Proceedings of the American Geophysical Union Chapman Conference on partial melting in the Earth's upper mantle, by Henry J. B. Dick, ed.; Sandra Tonge, ed. asst.; Henry J. B. Dick, L.G. Medaris Jr., M. Menzies, B. O. Mysen, M.J. O'Hara and Len Ramp, organizing committee.

B-097 1978 Bibliography of the geology and mineral resources of Oregon: Seventh supplement, January 1, 1971 to December 31, 1975, by compiled by GeoRef, with the assistance of Ainslie Bricker, edited by Caroline P. R. Hulick.

B-098 1979 Geologic hazards of eastern Benton County, Oregon, by James L. Bela.

B-099 1979 Geology and geologic hazards of northwestern Clackamas County, Oregon, by Herbert G. Schlicker and C. T. Finlayson.

B-100 1979 Geology and mineral resources of Josephine County, Oregon, by Len Ramp and Norman V. Peterson.

B-101 1980 Geologic field trips in western Oregon and southwestern Washington, by Keith F. Oles, J. Granville Johnson, Alan R. Niem, and Wendy A Niem, eds. Alan R. Niem, Wendy A. Niem, Edward M. Taylor, and Herbert G. Schlicker, Field Trip Committee Co-chairmen.

B-102 1981 Bibliography of the geology and mineral resources of Oregon, January 1, 1976 to December 31, 1979, by compiled by GeoRef Information System, and Debbie Burnetti and Klaus Neuendorf, eds.

B-103 1987 Bibliography of the geology and mineral resources of Oregon: Eighth Supplement, January 1, 1980, to December 31, 1984, by Klaus K.E. Neuendorf, ed. And compiled and indexed by GeoRef Information System, Kay Yost, ed.

B-107 2010 Geology of the upper Grande Ronde River basin, Union County, Oregon, by Mark L. Ferns, Vicki S. McConnell, Ian P. Madin, and Jenda A. Johnson.

Geologic Map Series

GMS-001 1962 Geology of the Sparta quadrangle, Oregon, by Harold J. Prostka.

GMS-002 1962 Geology of the Mitchell Butte quadrangle, Oregon, by Raymond E. Corcoran, R. A. Doak, P. W. Porter, F. I. Pritchett, and N. C. Privrasky.

GMS-003 1967 Preliminary geologic map of the Durkee quadrangle, Oregon, by Harold J. Prostka.

GMS-004 1967 4a. Free-air gravity anomaly map of Oregon (Berg, Joseph W., Jr.; Thiruvathukal, John V.). 4b. Complete Bouguer gravity anomaly map of Oregon (Berg, Joseph W., Jr.; Thiruvathukal, John V.). 4c. Complete Bouguer gravity anomaly map of Oregon (Dehlinger, H., Rinehart, W. A.; Couch, Richard W.; Gemperle, M.), by Joseph W. Berg, Jr. and John V. Thiruvathukal.

GMS-005 1971 Geology of the Powers quadrangle, Oregon, by Ewart M. Baldwin and Paul D. Hess.

GMS-006 1974 A preliminary report on the geology of part of the Snake River Canyon, Oregon and Idaho, by Tracy L. Vallier.

GMS-007 1976 Geology of the Oregon part of the Baker 1 degree by 2 degree quadrangle, by Howard C. Brooks, James R. McIntyre, and George W. Walker.

GMS-008 1976 Complete Bouguer gravity anomaly map, Cascade Mountain Range, central Oregon, by G. Stephen Pitts, and Richard W. Couch.

GMS-009 1978 Total field aeromagnetic anomaly map: Cascade Mountain Range, central Oregon, by Richard W. Couch, M. Gemperle, and G. Connard.

GMS-010 1978 Low- to intermediate-temperature thermal springs and wells in Oregon, by Richard G. Bowen, Norman V. Peterson, and Joseph F. Riccio.

GMS-011 1978 Preliminary geothermal resource map of Oregon, by Joseph F. Riccio.

GMS-012 1979 Geologic map of the Oregon part of the Mineral quadrangle, by Howard C. Brooks.

GMS-013 1979 Geologic map of Huntington and part of Olds Ferry quadrangles, Oregon, by Howard C. Brooks.

GMS-014 1981 Index to published geologic mapping in Oregon, 1898-1979, by C. A. Schumacher.

GMS-015 1981 Free-air anomaly map and complete Bouguer gravity anomaly map: Cascade Mountain Range, northern Oregon, by Richard W. Couch, G. Stephen Pitts, David E. Braman, and M. Gemperle.

GMS-016 1981 Free-air gravity anomaly map and complete Bouguer gravity anomaly map: Cascade Mountain Range, southern Oregon, by Richard W. Couch, G. Stephen Pitts, C. A. Veen, and M. Gemp.

GMS-017 1981 Total field aeromagnetic anomaly map: Cascade Mountain Range, southern Oregon, by Richard W. Couch, M. Gemperle, W. H. McLain, and G. G. Connard.

GMS-018 1981 Geology of the Rickreall, Salem West, Monmouth, and Sidney 7 1/2 minute quadrangles, Marion, Polk, and Linn Counties, Oregon, by James L. Bela.

GMS-019 1982 Geology and gold deposits of the Bourne quadrangle, Baker and Grant Counties, Oregon, by Howard C. Brooks, Mark L. Ferns, R. I. Coward, E. K. Paul, and M. Nunlist.

GMS-020 1982 Map showing geology and geothermal resources of the southern half of the Burns 15 minute quadrangle, Oregon, by David E. Brown.

GMS-021 1982 Map showing geology and geothermal resources of the Vale East 7 1/2 minute quadrangle, Oregon, by David E. Brown.

GMS-022 1982 Geology and mineral resources map of the Mt. Ireland quadrangle, Baker and Grant Counties, Oregon, by Mark L. Ferns, Howard C. Brooks, and J. Ducette.

GMS-023 1982 Geologic map of the Sheridan quadrangle, Polk and Yamhill Counties, Oregon, by Michael E. Brownfield.

GMS-024 1982 Geologic map of the Grand Ronde quadrangle, Polk and Yamhill Counties, Oregon, by Michael E. Brownfield.

GMS-025 1982 Geology and gold deposits of the Granite quadrangle, Grant County, Oregon, by Howard C. Brooks, Mark L. Ferns, and E. D. Mullen.

GMS-026 1982 Residual gravity maps of the northern, central, and southern Cascade Range, Oregon, 121˚00' to 122˚30'W. by 42˚00' to 45˚45'N., by Richard W. Couch, G. Stephen Pitts, M. Gemperle, C. A. Veen, and David E. Braman.

GMS-027	1982	Geologic and neotectonic evaluation of north-central Oregon: The Dalles 1 degree by 2 degree quadrangle, by James L. Bela.
GMS-028	1983	Geology and gold deposits map of the Greenhorn quadrangle, Baker and Grant Counties, Oregon, by Mark L. Ferns, Howard C. Brooks, and Dan G. Avery.
GMS-029	1983	Geology and gold deposits map of the northeast quarter of the Bates quadrangle, Baker and Grant Counties, Oregon, by Howard C. Brooks, Mark L. Ferns, G. R Wheeler, and Dan G. Avery.
GMS-030	1984	Geologic map of the southeast quarter of the Pearsoll Peak quadrangle, Curry and Josephine Counties, Oregon, by Len Ramp.
GMS-031	1984	Geology and gold deposits map of the northwest quarter of the Bates quadrangle, Grant County, Oregon, by Mark L. Ferns, Howard C. Brooks, and G. R. Wheeler.
GMS-032	1984	Geologic map of the Wilhoit quadrangle, Oregon, by Paul R. Miller and William N. Orr.
GMS-033	1984	Geologic map of the Scotts Mills quadrangle, Oregon, by Paul R. Miller and William N. Orr.
GMS-034	1984	Geologic map of the Stayton NE quadrangle, Oregon, by Paul R. Miller and William N. Orr.
GMS-035	1984	Geology and gold deposits map of the southwest quarter of the Bates quadrangle, Grant County, Oregon, by Howard C. Brooks, Mark L. Ferns, and Dan G. Avery.
GMS-036	1984	Mineral resources map of Oregon, by Mark L. Ferns and Donald F. Huber.
GMS-037	1985	Mineral resources map, offshore Oregon, by Jerry J. Gray and LaVerne D. Kulm.
GMS-038	1986	Geologic map of the northwest quarter of the Cave Junction quadrangle, Josephine County, Oregon, by Len Ramp.
GMS-039	1985	Geologic bibliography and index maps of the ocean floor off Oregon and the adjacent continental margin, by Carolyn P. Peterson, LaVerne D. Kulm, and Jerry J. Gray.
GMS-040	1985	Total field aeromagnetic anomaly maps: Cascade Mountain Range, northern Oregon, by Richard W. Couch, M. Gemperle, and R. Peterson.
GMS-041	1987	Geology and mineral resources map of the Elkhorn Peak quadrangle, Baker County, Oregon, by Mark L. Ferns, Howard C. Brooks, Dan G. Avery, and Charles D. Blome.
GMS-042	1986	Geologic map of the ocean floor off Oregon and the adjacent continental margin, by Carolyn P. Peterson, LaVerne D. Kulm, and Jerry J. Gray.
GMS-043	1987	Geologic map of the Eagle Butte and Gateway quadrangles, Jefferson and Wasco Counties, Oregon, by Gary A. Smith and Glenn A. Hayman.
GMS-044	1987	Geologic map of the Seekseequa Junction and a portion of the Metolius Bench quadrangles, Jefferson County, Oregon, by Gary A. Smith.
GMS-045	1987	Geologic map of the Madras West and Madras East quadrangles, Jefferson County, Oregon, by Gary A. Smith.
GMS-046	1987	Geologic map of the Breitenbush River area, Linn and Marion Counties, Oregon, by George R. Priest, Neil M. Woller, and Mark L. Ferns.
GMS-047	1987	Geologic map of the Crescent Mountain area, Linn County, Oregon, by Gerald L. Black, Neil M. Woller, and Mark L. Ferns.
GMS-048	1988	Geologic map of the McKenzie Bridge quadrangle, Lane County, Oregon, by George R. Priest, Gerald L. Black, Neil M. Woller, and Edward M. Taylor.
GMS-050	1986	Geologic map of the Drake Crossing quadrangle, Marion County, Oregon, by William N. Orr and Paul R. Miller.
GMS-051	1986	Geologic map of the Elk Prairie quadrangle, Marion and Clackamas Counties, Oregon, by William N. Orr and Paul R. Miller.
GMS-052	1992	Geology and Mineral Resource Map of the Shady Cove quadrangle, Jackson County, Oregon, by Frank R. Hladky.
GMS-053	1988	Geology and mineral resources map of the Owyhee Ridge quadrangle, Malheur County, Oregon, by Mark L. Ferns.
GMS-054	1989	Geology and mineral resources map of the Graveyard Point quadrangle, Malheur County, Oregon, and Owyhee County, Idaho, by Mark L. Ferns.
GMS-055	1989	Geology and mineral resources map of the Owyhee Dam quadrangle, Malheur County, Oregon, by Mark L. Ferns.
GMS-056	1989	Geology and mineral resources map of the Adrian quadrangle, Malheur County, Oregon, and Canyon and Owyhee Counties, Idaho, by Mark L. Ferns.
GMS-057	1989	Geology and mineral resources map of the Grassy Mountain quadrangle, Malheur County, Oregon, by Mark L. Ferns and Len Ramp.
GMS-058	1989	Geology and mineral resources map of the Double quadrangle, Malheur County, Oregon, by Len Ramp and Mark L. Ferns.

GMS-059	1989	Geologic map of the Lake Oswego quadrangle, Clackamas, Multnomah, and Washington Counties, Oregon, by Marvin H. Beeson, Terry L. Tolan, and Ian P. Madin.
GMS-060	1994	Geologic map of the Damascus quadrangle, Clackamas, and Multnomah Counties, Oregon, by Ian P. Madin.
GMS-061	1990	Geology and mineral resources map of the Mitchell Butte quadrangle, Malheur County, Oregon, by Mark L. Ferns and Kevin M. Urbanczyk.
GMS-062	1992	Geology and mineral resources map of the Elbow quadrangle, Malheur County, Oregon, by Mark L. Ferns and Michael L. Cummings.
GMS-063	1991	Geology and mineral resources map of the Vines Hill quadrangle, Malheur County, Oregon, by Howard C. Brooks.
GMS-064	1990	Geology and Mineral Resource Map of the Sheaville quadrangle, Malheur County, Oregon and Owyhee County, Idaho, by Norman S. MacLeod.
GMS-065	1990	Geology and mineral resources map of the Mahogany Gap quadrangle, Malheur County, Oregon, by Norman S. MacLeod.
GMS-066	1990	Geology and mineral resources map of the Jonesboro quadrangle, Malheur County, Oregon, by James G. Evans.
GMS-067	1990	Geology and mineral resources map of the South Mountain quadrangle, Malheur County, Oregon, by James G. Evans.
GMS-068	1990	Geologic map of the Reston quadrangle, Douglas County, Oregon, by Gerald L. Black.
GMS-069	1992	Geology and mineral resources map of the Harper quadrangle, Malheur County, Oregon, by Mark L. Ferns and James P. O'Brien.
GMS-070	1992	Geology and mineral resources map of the Boswell Mountain quadrangle, Jackson County, Oregon, by by Thomas J. Wiley and Frank R. Hladky.
GMS-071	1992	Geology and mineral resources map of the Westfall quadrangle, Malheur County, Oregon, by Howard C. Brooks and James P. O'Brien.
GMS-072	1992	Geology and mineral resources map of the Little Valley quadrangle, Malheur County, Oregon, by Howard C. Brooks and James P. O'Brien.
GMS-073	1993	Geology and mineral resources map of the Cleveland Ridge quadrangle, Jackson County, Oregon, by Thomas J. Wiley.
GMS-074	1992	Geology and mineral resources map of the Namorf quadrangle, Malheur County, Oregon, by Mark L. Ferns and James P. O'Brien.
GMS-075	1991	Geologic map of the Portland quadrangle, Multnomah and Washington Counties, Oregon, and Clark County, Washington, by Marvin H. Beeson, Terry L. Tolan, and Ian P. Madin.
GMS-076	1993	Geologic map of the Camas Valley quadrangle, Douglas and Coos Counties, Oregon, by Gerald L. Black and George R. Priest.
GMS-077	1993	Geologic map of the Vale 30 x 60 minute quadrangle, Malheur County, Oregon, and Owyhee County, Idaho, by Mark L. Ferns, Howard C. Brooks, James G. Evans, and Michael L. Cummings.
GMS-078	1993	Geologic map of the Mahogany Mountain 30 x 60 Minute quadrangle, Malheur County, Oregon, and Owyhee County, Idaho, by Mark L. Ferns, James G. Evans, and Michael L. Cummings.
GMS-080	1993	Geology and mineral resources map of the McLeod quadrangle: Jackson County, Oregon, by Frank R. Hladky.
GMS-081	1994	Geology and Mineral Resource Map of the Tumalo Dam quadrangle, Deschutes County, Oregon, by Edward M. Taylor and Mark L. Ferns.
GMS-082	1994	Geology and mineral resources map of the Limber Jim Creek quadrangle, Union County, Oregon, by Mark L. Ferns and William H. Taubeneck.
GMS-083	1994	Geologic map of the Kenyon Mountain quadrangle, Douglas County, Oregon, by Gerald L. Black.
GMS-084	1994	Geologic map of the Remote quadrangle, Coos County, Oregon, by Gerald L. Black.
GMS-085	1994	Geologic map of the Mount Gurney quadrangle, Douglas and Coos Counties, Oregon, by Thomas J. Wiley, George R. Priest, and Gerald L. Black.
GMS-086	1994	Geologic map of the Tenmile quadrangle, Douglas County, Oregon, by Thomas J. Wiley and Gerald L. Black.
GMS-087	1995	Geologic map of the Three Creek Butte quadrangle, Deschutes County, Oregon, by Edward M. Taylor and Mark L. Ferns.
GMS-088	1994	Geologic map of the Lakecreek quadrangle, Jackson County, Oregon, by Frank R. Hladky.
GMS-089	1995	Relative earthquake hazard map of the Mount Tabor quadrangle, Multnomah County, Oregon, and Clark County, Washington, by Matthew A. Mabey, Dan B. Meier, and Stephen P. Palmer.

GMS-093	1995	Relative earthquake hazard maps of the Siletz Bay area, coastal Lincoln County, Oregon, by Yumei Wang and George R. Priest.
GMS-094	1995	Geologic map of the Charleston quadrangle, Coos County, Oregon, by Ian P. Madin, Galan W. McInelly, and Harvey M. Kelsey.
GMS-095	1998	Geology of the Henkle Butte quadrangle, Deschutes County, Oregon, by Edward M. Taylor.
GMS-096	2004	Geologic map of the Fort Klamath quadrangle, Klamath County, Oregon, by Thomas J. Wiley.
GMS-097	1995	Geologic map of the Coos Bay quadrangle, Coos County, Oregon, by Gerald L. Black and Ian P. Madin.
GMS-098	1995	Reconnaissance geologic map of the Dora and Sitkum quadrangles, Coos County, Oregon, by Thomas J. Wiley.
GMS-099	1995	Tsunami hazard map of the Siletz Bay area, Lincoln County, Oregon, by George R. Priest, Ming Qi, Antonio M. Baptista, Curt D. Peterson, and Mark E. Darienzo.
GMS-101	1996	Geologic map of the Steelhead Falls quadrangle, Deschutes and Jefferson Counties, Oregon, by Mark L. Ferns, Donald A. Stensland, and Gary A. Smith.
GMS-102	2002	Geologic map of the Keno quadrangle, Klamath County, Oregon, by Frank R. Hladky and Stanley A. Mertzman.
GMS-103	2002	Geologic map of the Richter Mountain quadrangle, Douglas and Jackson Counties, Oregon, by Robert B. Murray and M. Allan Kays.
GMS-106	1996	Geology and mineral resources map of the Grizzly Peak quadrangle, Jackson County, Oregon, by Frank R. Hladky.
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GMS-110	1997	Geologic map of the Tucker Flat quadrangle, Union and Baker Counties, Oregon, by Ian P. Madin.
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GMS-112	2003	Geologic map of the Dairy quadrangle, Klamath County, Oregon, by Frank R. Hladky.
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GMS-118	2008	Geologic map of the Klamath Falls area, Klamath County, Oregon, by George R. Priest, Frank R. Hladky, and Robert B. Murray.
GMS-119	2009	Geologic map of the Oregon City 7.5' quadrangle, Clackamas County, Oregon, by Ian P. Madin.

Interpretive Map Series

IMS-004	1997	Map showing faults, bedrock geology, and sediment thickness of the western half of the Oregon City 1:100,000 quadrangle, Washington, Multnomah, Clackamas, and Marion Counties, Oregon, by Scott Burns, Lawrence Growney, Brett Brodersen, Robert S. Yeats, and Thomas A. Popowski.
IMS-028	2009	Oregon: A Geologic History, by Ian P. Madin.

Lidar Landscapes Series

un-numbered	2013	Willamette River historical stream channels, Oregon, by Daniel E. Coe.

Miscellaneous Paper Series

MP-01	1950	A description of some Oregon rocks and minerals, by Hollis M. Dole.
MP-02	1951; 1964, rev.	Key to Oregon Mineral Deposits Map, by Ralph S. Mason.
MP-05	1954	Oregon's gold placers, by A. O. Bartell.
MP-07	1959; 1966, Supp.	Bibliography of theses and dissertations on Oregon geology, by compiled by Herbert G. Schlicker, (Miriam Roberts, Supplement).
MP-10	1965	Articles on recent volcanism in Oregon, by G. T. Benson, Norman V. Peterson, Edward A. Groh, and Edward M. Taylor.

MP-11	1968	A collection of articles on meteorites, by by Erwin F. Lange, E. P. Henderson, and Hollis M. Dole.
MP-12	1968	Index to published geologic mapping in Oregon, 1898-1967, by Raymond E. Corcoran.
MP-13	1975	Index to the Ore Bin, 1950-1974, by Margaret C. Lewis, Nora T. Mussotto, and Carol S. Brookhyser, eds.
MP-14	1970	Thermal springs and wells in Oregon, by Richard G. Bowen and Norman V. Peterson.
MP-15	1971	Quicksilver deposits in Oregon, by Howard C. Brooks.
MP-16	1973	A mosaic of Oregon from ERTS-1 imagery, by Robert E. Lawrence and Charles E. Poulten.
MP-18	1975	Proceedings of the citizens' forum on potential future energy sources, by Karl Dittmer, Ray Foleen, E. Wendell Hewson, Aden B. Meinel, Marjorie P. Meinel, R. G. Bowen, James A. Middleton, and Albert J. Fomey.
MP-20	1978	Investigations of nickel in Oregon, by Len Ramp.

Open-File Reports

O-69-01	1969	Analyses of stream-sediment samples from southwestern Oregon west of longitude 122 degrees and south of latitude 43 degrees, by Richard G. Bowen.
O-70-01	1970	Sand and gravel: Bear Creek and Rogue River valleys, Jackson County, Oregon, by Herbert G. Schlicker and Robert J. Deacon.
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O-72-01	1972	Mineral resource status of state-owned lands in Malheur County, Oregon, by Norman S. Wagner.
O-74-01	1974	A preliminary geological investigation of the ground effects of earthquakes in the Portland metropolitan area, Oregon, by Paul E. Hammond, G. Benson, D. Cash, J. Donovan, and B. Gannon.
O-75-01	1975	A review of geologic conditions at the Pebble Springs nuclear plant site, by Vernon C. Newton, Jr., and Norman V. Peterson.
O-75-02	1975	Central Western and High Cascades geological reconnaissance, and heat flow location recommendations, by Norman V. Peterson and Walter Youngquist.
O-75-05	1975	A preliminary, annotated bibliography of the geology of Mount Hood, by M. C. McCarthy.
O-75-09	1975	Aggregate resources of Josephine County, Oregon, by Herbert G. Schlicker, Robert A. Schmuck, and Pedro Pescador.
O-76-01	1976	Electrical resistivity and evaluation of the Glass Buttes geothermal anomaly, Lake County, Oregon, by Donald A. Hull.
O-76-03	1976	Ferruginous bauxites of the Pacific Northwest, by John W. Hook.
O-76-04	1976	Stream sediment geochemistry, northeastern Oregon.
O-76-05	1976	Preliminary report on the reconnaissance geology of the Upper Clackamas and North Santiam rivers area, Cascade Range, Oregon, by Paul E. Hammond.
O-76-06	1976	Engineering geology of the John Day area, Grant County, Oregon, by Herbert G. Schlicker and Howard C. Brooks.
O-77-1a	1977	Preliminary geologic map of the Sawtooth Ridge quadrangle, by Howard C. Brooks, Richard G. Bowen, Donald A. Hull, and R. W. Hammitt.
O-77-1b	1977	Preliminary geologic map of the Keating NW quadrangle, by Howard C. Brooks.
O-77-04	1977	Geologic restraints to development in selected areas of Marion County, Oregon, by Herbert G. Schlicker.
O-77-05	1977	Reconnaissance geologic map of the Virtue Flat quadrangle, Baker County, Oregon, by Howard C. Brooks, J. R. McIntyre, W. H. Pokorny, and S. R. Renoud.
O-77-06	1977	Preliminary geologic map of the Baker quadrangle, Oregon, by Howard C. Brooks, J. R. McIntyre, and B. A. Gordon.
O-78-01	1978	Geologic hazards review: Trojan Nuclear Power Plant site, Columbia County, Oregon.
O-78-02	1978	Supplement to the February 11, 1974 Pebble Springs review, by Vernon C. Newton, Jr., Norman V. Peterson, and John D. Beaulieu, eds.
O-78-03	1978	Preliminary geologic map of the Bowen Valley quadrangle, Oregon, by Howard C. Brooks and J. R. McIntyre.
O-78-05	1978	Reconnaissance study of Oregon's stone quarries and asbestiform minerals occurrences within ten miles of serpentinite, by Jerry J. Gray.

O-78-06	1978	Geophysical logs, Old Maid Flat #1, Clackamas County, Oregon.
O-79-01	1979	Annotated bibliography of the geology of the Columbia Plateau (Columbia River Basalt) and adjacent areas of Oregon, by James L. Bela.
O-79-02	1979	Geochemical studies of rocks, water, and gases at Mt. Hood, Oregon, by Harold A. Wollenberg, Richard E. Bowen, Harry R. Bowman, and Beverly Strisower.
O-79-03	1979	Chemical analyses of thermal springs and wells in Oregon, by USGS and DOGAMI, comp.
O-79-04	1979	Mineral resources maps and indexes of geologic mapping of AMS sheets, Baker, Deschutes, Union, Umatilla, and Wallowa Counties, Oregon, by Steven H. Hollis (compiler).
O-79-04	1979	Mineral resource map and index of geologic mapping (before 1960) of the Baker AMS sheet, by Steven H. Hollis, comp.
O-79-04	1979	Index of geologic mapping (1960-1979) of the Baker AMS sheet, by Steven H. Hollis, comp.
O-79-04	1979	Mineral resource map of the Bend AMS sheet, by Steven H. Hollis, comp.
O-79-04	1979	Index of geologic mapping (before 1960) of the Bend AMS sheet, by Steven H. Hollis, comp.
O-79-04	1979	Index of geologic mapping (1960-1979) of the Bend AMS sheet, by Steven H. Hollis, comp.
O-79-04	1979	Mineral resource map and index of geologic mapping (before 1960) of the Canyon City AMS sheet, by Steven H. Hollis, comp.
O-79-04	1979	Index of geologic mapping (1960-1979) of the Canyon City AMS sheet, by Steven H. Hollis, comp.
O-79-04	1979	Mineral resource map and index of geologic mapping of the Grangeville AMS sheet, by Steven H. Hollis, comp.
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O-79-04	1979	Mineral resource map and index of Geologic mapping of The Dalles AMS sheet, by C. A. Schumacher.
O-79-05	1979	Micropaleontological study of four deep wells in Coos County, Oregon, by Daniel R. McKeel.
O-79-06	1979	Geologic map of the Bull Run Rock quadrangle, Oregon, by Howard C. Brooks and Mark L. Ferns.
O-79-07	1979	Geologic map of the Rastus Mountain quadrangle, Oregon, by Howard C. Brooks, Mark L. Ferns, R. W. Nusbaum, and P. M. Kovich.
O-80-01	1980	Micropaleontological study of five wells, western Willamette Valley, Oregon, by Daniel R. McKeel.
O-80-02	1980	Preliminary geology and geothermal resource potential of the Belknap-Foley area, Oregon, by David E. Brown, Gary D. McLean, George R. Priest, Neil M. Woller, and Gerald L. Black.
O-80-03	1980	Preliminary geology and geothermal resource potential of the Willamette Pass area, Oregon, by David E. Brown, Gary D. McLean, Neil M. Woller, and Gerald L. Black.
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O-80-09	1980	Preliminary geology and geothermal resource potential of the Lakeview area, Oregon, by Norman V. Peterson, David E. Brown, and Gary D. McLean.
O-80-10	1980	Preliminary geology and geothermal resource potential of the Alvord Desert area, Oregon, by Norman V. Peterson and David E. Brown.
O-80-13	1980	Lithologic logs of eleven wells and foraminiferal species lists of four wells in southwestern Oregon, by Daniel R. McKeel.
O-80-14	1980	Progress report on activities of the Low-Temperature Resource Assessment Program 1979-1980, by Donald A. Hull, principal investigator.

O-81-02	1981	Geophysical logs, Old Maid Flat 7A, Clackamas County. Five PDFs; see http://www.oregongeology.org/pubs/ofr/p-OFR.htm for links.
O-81-05	1981	Preliminary geologic map of the Amity and Mission Bottom quadrangles, Oregon, by Michael E. Brownfield and Herbert G. Schlicker.
O-81-06	1981	Preliminary geologic map of the McMinnville and Dayton quadrangles, Oregon, by Michael E. Brownfield and Herbert G. Schlicker.
O-81-07	1981	Rock material resources of Marion, Polk, Yamhill, and Linn Counties, Oregon, by Jerry J. Gray and Allen H. Throop.
O-81-08	1981	Reconnaissance geochemical study of the Quartzville mining district, Linn County, Oregon, by Steven R. Munts.
O-81-10	1981	Post-Columbia River Basalt Group stratigraphy and map compilation of the Columbia Plateau, Oregon, by Saleem M. Farooqui, Russell C. Bunker, Richard E. Thoms, Daniel C. Clayton, and James L. Bela.
O-82-02	1982	Preliminary geologic map of the Ballston quadrangle, Oregon, by Michael E. Brownfield.
O-82-03	1982	Geologic map of the Langlois quadrangle, Oregon, by C. A. Schumacher.
O-82-05	1982	Final technical report: Oregon Low Temperature Resource Assessment Program, by George R. Priest, Gerald L. Black, and Neil M. Woller.
O-82-07	1982	Geology and geothermal resources of the Cascades, Oregon, by George R. Priest and Beverly F. Vogt.
O-82-08	1982	Gravity and aeromagnetic maps of the Powell Buttes area, Crook, Deschutes, and Jefferson Counties, Oregon, by Geophysics Group, Oregon State University.
O-82-09	1982	Gravity anomalies in the Cascade Range in Oregon: Structural and thermal implications, by Richard W. Couch, G. Stephen Pitts, M. Gemperle, David E. Braman, and C. A. Veen.
O-83-02	1983	Geology and mineral resources of 18 BLM wilderness study areas, Harney and Malheur Counties, Oregon, by Jerry J. Gray, Norman V. Peterson, Janine Clayton, and Gary L. Baxter.
O-83-04	1983	Geochemical survey of the western part of the Ochoco National Forest, Crook and Wheeler Counties, Oregon, by Mark L. Ferns and Howard C. Brooks.
O-83-05	1983	Mineral potential of the Fall Creek mining district: A geological-geochemical survey, by Jerry J. Gray and Dulcy A. Berri.
O-83-06	1983	Preliminary geologic map of the west half of the Vancouver (Wa.-Ore.) 1degree by 2 degree quadrangle, Oregon, by R. E. Wells, Alan R. Niem, Norman S. MacLeod, Parke D. Snavely, Jr., and Wendy A. Niem.
O-84-03	1984	Geochemical data for the Bourne; Mt. Ireland; Granite; Greenhorn; and the northeast, northwest, and southwest quarters of the Bates quadrangles, Baker and Grant Counties, Oregon, by Mark L. Ferns, Howard C. Brooks, and Gary L. Baxter.
O-84-04	1984	Heat-flow map of the Cascade Range of Oregon and index map of mapping in the Oregon Cascades, by Oregon Department of Geology and Mineral Industries.
O-84-05	1984	Bench testing of silica sand from deposits in Clatsop and Morrow Counties, Oregon, by Jerry J. Gray.
O-85-02	1985	Preliminary report on northeastern Oregon lignite and coal resources, Union, Wallowa, and Wheeler Counties, by Mark L. Ferns.
O-85-03	1985	A survey of Oregon offshore mapping, by Glenn W. Ireland.
O-86-03	1986	Investigation of the thermal regime and geologic history of the Cascade Volcanic Arc: First phase of a program for scientific drilling in the Cascade Range, by George R. Priest.
O-86-04	1986	Mineral assessment of the southwest quarter of the Stevenson [Stephenson] Mountain 30- by 60-minute quadrangle, Jefferson and Crook Counties, Oregon, by Jerry J. Gray, Gary L. Baxter, and Robert O. Van Atta.
O-86-05	1986	Geology and coal resources of the Arbuckle Mountain coal field, Morrow County, Oregon, by Mark L. Ferns and Howard C. Brooks.
O-86-06	1986	The state of scientific information relating to the biology and ecology of the Gorda Ridge study area, Northeast Pacific Ocean: Benthos, by Michel A. Boudrias and Gary L. Taghon.
O-86-07	1986	The state of scientific information relating to the biology and ecology of the Gorda Ridge study area, Northeast Pacific Ocean: Nekton, by James T. Harvey, and David L. Stein.
O-86-08	1986	The state of scientific information relating to the biology and ecology of the Gorda Ridge study area, Northeast Pacific Ocean: Plankton, by Steven G. Ellis, and Jonathan H. Garber.
O-86-09	1986	The state of scientific information relating to the biology and ecology of the Gorda Ridge study area, Northeast Pacific Ocean: Seabirds, by Lynn D. Krasnow.

O-86-10	1986	Inventory of heavy minerals and metals, southern Washington, Oregon, and northern California continental shelf and coastal region, by LaVerne D. Kulm, Curt D. Peterson, and Margaret C. Stribling.
O-86-13	1986	Studies of trace metals and active hydrothermal venting on the Gorda Ridge, by Robert W. Collier, Scott H. Holbrook, and James M. Robbins.
O-86-16	1986	Hydrothermal sulfides, breccias, and greenstones from the Gorda Depression, by Roger Hart, Douglas Pyle, and James Robbins.
O-86-18	1986	Hydrothermal precipitations from basalts on the Gorda Ridge and the President Jackson seamounts, by Katherine J. Howard and Martin R. Fisk.
O-86-19	1986	Sediment studies on the Gorda Ridge, by Robert Karlin, and Mitchell Lyle.
O-87-02	1987	Stratigraphy of the Standard Kirkpatrick 1, Gilliam County, Oregon, by T. P. Fox, and S. P. Reidel.
O-87-03	1987	Directory of mineral producers in Oregon, by Jerry J. Gray and Klaus K. E. Neuendorf.
O-88-04	1988	Elemental content of heavy-mineral concentrations on the Continental Shelf off Oregon and northernmost California, by LaVerne D. Kulm and Curt D. Peterson.
O-88-05	1988	Geology and geothermal resources of the Breitenbush-Austin Hot Springs area, Clackamas and Marion Counties, Oregon, by David R. Sherrod, ed.
O-88-06	1988 (2nd rev.)	A description of some of Oregon rocks and minerals, 1988, by Hollis M. Dole (1950), Lawrence L. Brown (2nd rev.).
O-89-12	1989	Preliminary feasibility study: Oregon placer minerals, by Oregon Placer Minerals Technical Task Force.
O-90-03	1990	Preliminary geology map of the Kane Springs [Kane Spring] Gulch quadrangle, Malheur County, Oregon, by Mark L. Ferns and Kevin M. Urbanczyk.
O-91-02	1991	Preliminary resource and environmental data: Oregon marine placer minerals, by Oregon Placer Minerals Technical Task Force.
O-91-03	1991	Preliminary geology map of the Keeny Ridge quadrangle, Malheur County, Oregon, by Mark L. Ferns and James P. O'Brien.
O-91-08	1991	Mineral information layer by county (MILOC), by Jerry J. Gray. *Superseded by MILO.*
O-92-02	1992	Preliminary geologic map of the Bogus Bench quadrangle, Malheur County, Oregon, by Mark L. Ferns.
O-92-03	1992	Geology and geothermal resources of the Santiam Pass Area of the Oregon Cascade Range, Deschutes, Jefferson, and Linn Counties, Oregon, by Brittain E. Hill (ed.).
O-92-04	1992	Neotectonic map of the Oregon continental margin and adjacent abyssal plain, by Chris Goldfiner, Robert S. Yeats, Clifton Mitchell, Curt D. Peterson, Mark Darienzo, Wendy Grant, and George R. Priest.
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O-92-12	1992	Preliminary geologic map of the Rockville quadrangle, Malheur County, Oregon and Owyhee County, Idaho, by Mark L. Ferns and Deborah Gilbert.
O-92-13	1992	Preliminary geologic map of the Sacramento Butte quadrangle, Malheur County, Oregon, by Mark L. Ferns.
O-92-14	1992	Preliminary geologic map of the Saddle Butte quadrangle, Malheur County, Oregon, by Mark L. Ferns.
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O-92-17	1992	Preliminary geologic map of the Rufino Butte quadrangle, Malheur County, Oregon, by Howard C. Brooks.

O-93-02	1993	Preliminary geologic map of the Burnt Flat quadrangle, Malheur County, Oregon, by Mark L. Ferns and Charles Williams.
O-93-03	1993	Preliminary geologic map of the Copeland Reservoir quadrangle, Malheur County, Oregon, by Howard C. Brooks.
O-93-04	1993	Preliminary geologic map of the Crowley quadrangle, Oregon, by Mark L. Ferns and Charles Williams.
O-93-05	1993	Preliminary geologic map of the Rinehart Canyon quadrangle, Malheur County, Oregon, by Mark L. Ferns and James G. Evans.
O-93-08	1993	Mineral Information Layer for Oregon by county (MILOC93) database, by Jerry J. Gray.
O-93-09	1993	Directory of mineral producers in Oregon, by Jerry J. Gray and Klaus K. E. Neuendorf.
O-93-11	1993	Preliminary geologic map of the Sourdough Springs quadrangle, Malheur County, Oregon, by Michael L. Cummings.
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O-94-02	1994	Beach-shoreline database, Pacific Northwest region, U.S.A., by C. D. Peterson and others.
O-94-31	1994	Oregon's mineral industries: An assessment of the size and economic importance of mineral extraction in 1993, by Robert Whelan.
O-95-04	1995	Index to geologic maps of Oregon by U.S. Geological Survey topographic quadrangle name, 1883-1994, by Peter L. Stark.
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O-02-02	2001	Geology of the surface and subsurface of the southern Grande Ronde Valley and Lower Catherine Creek drainage, Union County, Oregon, by Mark L. Ferns, Ian P. Madin, Vicki S. McConnell, and Jenda J. Johnson.
O-02-03	2002	Geologic framework of the Clarno Unit, John Day Fossil Beds National Monument, Central Oregon, by E. A. Bestland, Paul E. Hammond, D. L. S. Blackwell, M. A. Kays, G. J. Retallack, and J. Stimac.
O-03-03	2003	Draft geologic map of the Merrill and Malin quadrangles, Klamath County, Oregon, by Margaret D. Jenks and Ian P. Madin.
O-03-07	2003	Reconnaissance geologic evaluation for building suitability of a portion of the Moolack Beach landslide, Lincoln County, Oregon, by George R. Priest.
O-03-08	2003	Review of geologic report for Surfrider Resort proposal, Lincoln County, Oregon: OPRD Permit #BA-555-03, by George R. Priest, Jonathan C. Allan, and Yumei Wang.
O-04-02	2004	Geologic mapping and database for Portland area fault studies: Final technical report, by Ian P. Madin.
O-04-04	2004	SOTA field trip guide, State of the Cascade Arc: Stratocone persistence, mafic lava shields, and pyroclastic volcanism associated with intra-arc rift propagation, by Richard Conrey, Anita Grunder, and Mariek Schmidt.
O-04-06	2004	Geologic map of the LaGrande Reservoir quadrangle, Union and Baker Counties, Oregon, by Ian P. Madin.
O-04-07	2004	Geologic map of Lorella quadrangle, Klamath County, Oregon, by Gerald L. Black.

O-04-08	2004	Geologic hazards study for the Columbia River transportation corridor, by Yumei Wang and Amar Chaker.
O-04-10	2004	Upper Grande Ronde River Basin geology workshop field trip guide, September 5 and 6, 2001, by Vicki S. McConnell and Mark L. Ferns.
O-04-12	2004	Geologic map of the Anthony Butte quadrangle, Union and Baker Counties, Oregon, by Ian P. Madin and William H. Taubeneck.
O-04-13	2004	Geologic map of Josephine County, Oregon, by Len Ramp, and Norman V. Peterson.
O-04-23	2004	Field trip guide to the geology of the Umatilla River Basin, October 14 and 15, 2004, by Mark L. Ferns, Vicki S. McConnell, and Kate Ely.
O-06-03	2006	Oregon statewide geologic map data: A pilot project where digital techniques changed the geologic map compilation process and product [[map plate OGDC-1, NE portion of state], by Mark L. Ferns, Ronald P. Geitgey, Margaret D. Jenks, Lina Ma, Ian P. Madin, Vicki S. McConnell, and Paul E. Staub.
O-06-04	2006	Oregon statewide geologic map data: preliminary geologic compilation map of the southeast portion of Oregon [map plate of SE portion of OGDC-2], by Margaret D. Jenks, Mark L. Ferns, Paul E. Staub, Ian P. Madin, Ronald P. Geitgey, Lina Ma, and Clark Niewendorp.
O-06-05	2006	Preliminary geologic map of the Wimer and McConville Peak 7.5 minute quadrangles, Jackson and Josephine Counties, Oregon, by Thomas J. Wiley.
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O-06-08	2006	Preliminary geologic map of the Cayuse 7.5 minute quadrangle, Umatilla County, Oregon, by Mark L. Ferns.
O-06-09	2006	Preliminary geologic map of the Mission 7.5 minute quadrangle, Umatilla County, Oregon, by Mark L. Ferns and Kate Ely.
O-06-10	2006	Preliminary geologic map of the Thorn Hollow 7.5 minute quadrangle, Umatilla County, Oregon, by Mark L. Ferns.
O-06-11	2006	Preliminary geologic map of the Sexton Mountain, Murphy, Applegate, and Mount Isabelle 7.5 minute quadrangles, Jackson and Josephine Counties, Oregon, by Thomas J. Wiley.
O-06-12	2006	Preliminary geologic map of the Creswell 7.5 minute quadrangle, Lane County, Oregon, by Robert B. Murray.
O-06-13	2006	Preliminary geologic map of the Veneta 7.5 minute quadrangle, Lane County, Oregon, by Robert B. Murray and Ian P. Madin.
O-06-14	2006	Preliminary geologic map of the Cabbage Hill 7.5 minute quadrangle, Umatilla County, Oregon, by Mark L. Ferns and Vicki S. McConnell.
O-06-15	2006	Preliminary geologic map of the McKay Reservoir 7.5 minute quadrangle, Umatilla County, Oregon, by Mark L. Ferns and Vicki S. McConnell.
O-06-16	2006	Preliminary geologic map of the Table Rock 7.5 minute quadrangle, Umatilla County, Oregon, by Mark L. Ferns and Vicki S. McConnell.
O-06-17	2006	Preliminary geologic map of the Eugene East and Eugene West 7.5 minute quadrangles, Lane County, Oregon, by Ian P. Madin and Robert B. Murray.
O-06-18	2006	Preliminary geologic map of the Gold Hill and Rogue River 7.5 minute quadrangles, Jackson and Josephine Counties, Oregon, by Thomas J. Wiley.
O-06-19	2006	Geology of the upper Grande Ronde River basin, Union County, Oregon, by Mark L. Ferns, Vicki S. McConnell, and Ian P. Madin.
O-06-20	2006	Preliminary geologic map of the Service Buttes, Echo, Nolin, Barnhart and Pendleton 7.5 minute quadrangles (west to east), Umatilla County, Oregon, by Vicki S. McConnell.
O-06-21	2006	Preliminary geologic map of the Huston Lake 7.5 minute quadrangle, Crook County, Oregon, by Mark L. Ferns, and Jason D. McClaughry.
O-06-22	2006	Preliminary geologic map of the Prineville 7.5 minute quadrangle, Crook County, Oregon, by Jason D. McClaughry, and Mark L. Ferns.
O-06-23	2006	Preliminary geologic map of the Ochoco Reservoir 7.5 minute quadrangle, Crook County, Oregon, by Jason D. McClaughry, and Mark L. Ferns.

O-06-24	2006	Preliminary geologic map of the Powell Buttes 7.5 minute quadrangle, Crook County, Oregon, by Mark L. Ferns, and Jason D. McClaughry.
O-06-25	2006	Preliminary geologic and mineral resources map of the Mormon Basin 7.5 minute quadrangle, Baker and Malheur Counties, Oregon, by Howard C. Brooks.
O-06-26	2006	Preliminary geologic map of the Albany quadrangle, Linn, Marion and Benton Counties, Oregon, by Thomas J. Wiley.
O-07-05	2007	Geologic compilation map of part of the Upper Klamath Basin, Klamath County, Oregon, by Margaret D. Jenks.
O-07-08	2007	Preliminary geologic compilation map of the central portion of Oregon [map plate of Central portion of OGDC-3], by Clark A. Niewendorp, Margaret D. Jenks, Mark L. Ferns, Paul E. Staub, Edward M. Taylor, Lina Ma, and Ian P. Madin.
O-07-09	2007	Preliminary geologic map of the Brown Mountain 7.5 minute quadrangle, Jackson and Klamath Counties, Oregon, by Stanley A. Mertzman, Richard Hazlett, Stephen G. Weaver, Stephanie Brackin, Heather Cruz, Amy Humm, Amy Lunt, Heather Petcovic, Ben Schiffer, Rachel Sours-Page, Peter Taylor, Andrew Tittler, and Jonathon Zook.
O-07-10	2007	Preliminary geologic map of the Eagle Rock 7.5 minute quadrangle, Crook County, Oregon, by Jason D. McClaughry, and Mark L. Ferns.
O-07-11	2007	Preliminary geologic map of the Hensley Butte and Salt Butte 7.5 minute quadrangle, Crook County, Oregon, by Mark L. Ferns, and Jason D. McClaughry.
O-07-12	2007	Preliminary geologic map of the Stearns Butte 7.5 minute quadrangle, Crook County, Oregon, by Jason D. McClaughry, and Mark L. Ferns.
O-07-13	2007	Preliminary geologic map of the Lake of the Woods South 7.5 minute quadrangle, Klamath County, Oregon, by Stanley A. Mertzman, Richard W. Hazlett, Stephen G. Weaver, Robert Bruant, Jr., Stephen Crabtree, Lindley Hall, Richard Heermance III, Amy Humm, Jennifer Pallon, Matthew Reuer, James Rowe, Benjamin Schiffer, and Jonathon Zook.
O-07-14	2007	Preliminary geologic map of the Hamaker Mountain, Worden, and Lost River 7.5 minute quadrangles, Klamath County, Oregon, by Frank R. Hladky and Margaret D. Jenks.
O-07-15	2007	Preliminary geologic map of the Umatilla Basin, Morrow and Umatilla Counties, Oregon, by Ian P. Madin and Ronald P. Geitgey.
O-07-16	2007	Preliminary geologic compilation map of the southwest portion of Oregon [map plate of SW portion of OGDC-4], by Margaret D. Jenks, Stanley A. Mertzman, Thomas J. Wiley, Paul E. Staub, Marina Drazba, Lina Ma, Clark A. Niewendorp, and Ian P. Madin.
O-07-17	2007	Preliminary geologic map of the Aspen Lake 7.5 minute quadrangle, Klamath County, Oregon, by Stanley A. Mertzman, Stephen G. Weaver, Andrew Gavin, and Karyn Powers.
O-08-01	2008	Preliminary geologic map of the Spencer Creek 7.5 minute quadrangle, Klamath County, Oregon, by Stanley A. Mertzman.
O-08-03	2008	Preliminary geologic map of the Surveyor Mountain 7.5 minute quadrangle, Klamath County, Oregon, by Stanley A. Mertzman, Matthew Reuer, and Benjamin Schiffer.
O-08-04	2008	Preliminary geologic map of the Little Chinquapin Mountain 7.5 minute quadrangle, Jackson and Klamath Counties, Oregon, by Stanley A. Mertzman, Stephen Crabtree, Amy Lunt, and Isaac Weaver.
O-08-06	2008	Preliminary geologic map of the Linnton 7.5' quadrangle, Multnomah and Washington counties, Oregon, by Ian P. Madin, Lina Ma, and Clark A. Niewendorp.
O-08-07	2008	Preliminary geologic map of the Dixie Mountain 7.5' quadrangle, Washington, Multnomah, and Columbia counties, by Ian P. Madin and Clark A. Niewendorp.
O-08-08	2009	Preliminary geologic map of the Mule Hill 7.5' quadrangle, Klamath County, Oregon, and Siskiyou County, California, by Stanley A. Mertzman, Richard W. Hazlett, Isaac P. Weaver, Stephen Crabtree, Chris Eisinger, Amy Gaffney, Darren Gravely, Matthew Hall, Myra Hill, Bryan Klawiter, Gordon McCreight, Amber McIntosh, Jennifer McIntosh, Anders Nilsson, Stephanie Phippen, Sarah Robinson, Jacob Sewall, and Jeffrey Winick.
O-08-11	2008	Preliminary geologic map of the Lebanon and Onehorse Slough 7.5' quadrangles, Linn County, Oregon, by Mark L. Ferns and Jason D. McClaughry.
O-08-13	2008	Preliminary digital geologic compilation map of part of western Oregon [map plate of West portion of OGDC project], by Ray E. Wells, Alan R. Niem, George R. Priest, Lina Ma, Clark A. Niewendorp, and Ian P. Madin.

O-08-14	2008	Preliminary geologic maps of the Corvallis, Wren, and Marys Peak 7.5' quadrangles, Benton, Lincoln,and Linn counties, Oregon, by Thomas J. Wiley.
O-09-02	2009	Preliminary geologic map of the Robinson Butte 7.5' quadrangle, Jackson County, Oregon, by Stanley A. Mertzman, Stephen G. Weaver, Stephen A. Pasquale, Jill M. Baum, and Isaac P. Weaver.
O-09-03	2009	Preliminary digital geologic compilation map of part of northwestern Oregon, by Lina Ma, Ray E. Wells, Alan R. Niem, Clark A. Niewendorp, and Ian P. Madin.
O-09-04	2009	Preliminary geologic map of the Brownsville 7.5' quadrangle, Linn County, Oregon, by Mark L. Ferns and Jason D. McClaughry.
O-09-05	2009	Preliminary geologic map of the Lewisburg quadrangle, Benton, Linn, Polk, and Marion counties, Oregon, by Thomas J. Wiley.
O-09-07	2009	Lidar mosaic imagery of Mount Hood and surrounding area, Oregon, by Ian P. Madin.
O-09-08	2009	Lidar mosaic imagery of the Columbia River Gorge, Multnomah Falls to Cascade Locks, Oregon, by Ian P. Madin.
O-09-09	2009	Lidar mosaic imagery of the Portland Basin, Oregon and Washington, by Ian P. Madin.
O-09-10	2009	Preliminary geologic map of the Waterloo 7.5' quadrangle, Linn County, Oregon, by Mark L. Ferns and Jason D. McClaughry.
O-09-11	2009	Preliminary geologic map of the Sweet Home 7.5' quadrangle, Linn County, Oregon, by Jason D. McClaughry.
O-10-03	2010	Digital geologic map of the southern Willamette Valley, Benton, Lane, Linn, Marion, and Polk Counties, Oregon, by Jason D. McClaughry, Thomas J. Wiley, Mark L. Ferns, and Ian P. Madin.
O-11-03	2011	Preliminary geologic map of the Lake of the Woods North 7.5' quadrangle, Klamath County, Oregon, by Stanley A. Mertzman and others.
O-11-04	2011	Physiographic map of Lava Butte, Deschutes County, Oregon, by Rachel Lyles.
O-11-05	2011	Stream channels of the northern Willamette Valley, Clackamas, Marion, Polk, Washington, and Yamhill counties, Oregon, by Daniel E. Coe.
O-11-06	2011	Stream channels of the Tualatin Valley and Lower Willamette River, Clackamas, Multnomah, Washington, and Yamhill counties, Oregon, by Daniel E. Coe.
O-11-11	2011	Geologic database and generalized geologic map of Bear Creek Valley, Jackson County, Oregon, by Thomas J. Wiley, Jason D. McClaughry, and Jad A. D'Allura.
O-11-12	2011	Geologic Map of the Hawks Valley-Lone Mountain Region, Harney County, Oregon, by Alicja Wypych, William K. Hart, Kaleb C. Scarberry, Kelly C. McHugh, Stephen A. Pasquale, and Paul W. Legge.
O-12-01	2012	Preliminary geologic map of the Mount McLoughlin 7.5-minute quadrangle, Jackson and Klamath Counties, Oregon, by S. A. Mertzman, R. W. Hazlett, S. G. Weaver, I.P. Weaver, J. M. Baum, H. M. Cruz, M. S. Gilmore, T. J. McElfresh, J. L. Nauert, K. E. Nicolaysen, J. T. Rowe, A. Tittler, and W. R. Wright.
O-12-02	2012	Lidar-based surficial geologic map and database of the greater Portland, Oregon, area, Clackamas, Columbia, Marion, Multnomah, Washington, and Yamhill Counties, Oregon, and Clark County, Washington, by Lina Ma, Ian P. Madin, Serin Duplantis, and Kendra J. Williams.
O-12-03	2012	Digital geologic map of the Hood River Valley, Hood River and Wasco Counties, Oregon, by Jason D. McClaughry, Thomas J. Wiley, Richard M. Conrey, Cullen B. Jones, and Kenneth E. Lite, Jr.
O-12-04	2012	Western Oregon Seismic Reflection Data Imagery.
O-13-04	2013	Scoping of mineral potential: proposed Rogue Wilderness Area Additions, Josephine, Curry, Douglas, and Coos Counties, Oregon, by Clark A. Niewendorp.
O-13-12	2013	3D geology and shear-wave velocity models of the Portland, Oregon, metropolitan area, by Warren P. Roe and Ian P. Madin.
O-13-21	2013	Geologic map of the southwestern Oregon coast between Crook Point and Port Orford, Curry County, Oregon, by Jason D. McClaughry, Lina Ma, Cullen B. Jones, Katherine A. Mickelson, and Thomas J. Wiley.
O-13-23	2013	Silicic volcanism in the Menagerie Wilderness and adjacent regions of the Western Cascades in Oregon, by Geoffrey W. Cook, Craig M. White, and James L. Crowley.
O-14-01	2014	Geologic map of the southern Oregon coast between Port Orford and Bandon, Curry and Coos counties, Oregon, by Thomas J. Wiley, Jason D. McClaughry, Lina Ma, Katherine A. Mickelson, Clark A. Niewendorp, Laura L. Stimely, Heather H. Herinckx, and Jonathan Rivas.

O-15-03 2015 Lode mines and prospects in the North Santiam mining district, Marion and Clackamas counties, Oregon, by C. A. Niewendorp and J. W. Ghiorso.

O-15-04 2015 Geologic map of the southern Oregon coast between Bandon, Coquille, and Sunset Bay, Coos County, Oregon, by T. J. Wiley, J. D. McClaughry, C. A. Niewendorp, L. Ma, H. H. Herinckx, and K. A. Mickelson.

Quadrangle Map Series

QM-01 1957 A geologic map of the Bend [30 minute] quadrangle and a reconnaissance geologic map of the central portion of the High Cascade Mountains, by Howell Williams.

QM-02 1941 Reconnaissance geologic map of the Butte Falls quadrangle, Oregon, by W. D. Wilkinson, J. E. Allen, W. Lowell, W. D. Lowry, M. Hutchinson, H. Harper, R. Littleton, R. Meade, and S. Jones.

QM-03 1940 Preliminary geologic map of the Grants Pass quadrangle, Oregon, by Francis G. Wells, G. O, Gates, R. M. Grantham, P. E. Hotz, H. L. James, W. E. Kennett, J. V. Neuman, Jr., G. A. Rynearson, C. T. Smith, E. C. Tabor, Jr., and E. J. Tate.

QM-04 1968 Geologic map of the Ironside Mountain quadrangle, Oregon, by Wallace D. Lowry and Charles F. Wray.

QM-05 1956 Reconnaissance geologic map of the Lebanon [15'] quadrangle, Oregon, by Ira S. Allison and Wayne M. Felts.

QM-06 1939 Preliminary geologic map of the Medford quadrangle, Oregon, by Francis G. Wells, B. B. Colley, J. V. Neuman, Jr., R. M. Grantham, W. E. Kennett, P. E. Hotz, E. C. Tabor, Jr., and E. J. Tate.

QM-07 1940 Geologic map of the Round Mountain quadrangle, Oregon, by W. D. Wilkinson and John Eliot Allen.

QM-08 1941 Preliminary geologic map of the Sumpter quadrangle, Oregon, by J. T. Pardee, D. F. Hewett, T. H. Rosenkranz, F. J. Katz, and F. C. Calkins.

QM-09 1942 Geologic map of the Portland Area, by Ray C. Treasher.

QM-10 1938 Geologic reconnaissance of the central portion on the Wallowa Mountains, Oregon, by Warren Du Pre Smith.

QM-12 1951 State of Oregon map showing principal mineral deposits, by R. S. Mason.

QM-13 1945 State of Oregon map showing location of quicksilver deposits, by Francis Frederick.

Reconnaissance Map Series

RMS-01 2001 Reconnaissance geologic map of the La Grande 30' x 60' quadrangle, Baker, Grant, Umatilla, and Union Counties, Oregon, by Mark L. Ferns, Ian P. Madin, and William H. Taubeneck.

Short Papers

Shp-00 1939 Some data on black sand investigations.

Shp-01 1939 Preliminary report upon Oregon saline lakes, by Orin Fletcher Stafford.

Shp-02 1940 Industrial aluminum: A brief survey, by Leslie L. Motz.

Shp-03 1940 Advance report on some quicksilver prospects in the Butte Falls quadrangle, Oregon, by W. D. Wilkinson.

Shp-04 1940 Beneficiation by flotation of Willamette Valley limestones of Oregon, by J. B. Clemmer and B. H. Clemmons.

Shp-05 1941 Survey of non-metallic mineral production of Oregon for 1940, by C. P. Holdredge.

Shp-06 1941 Pumice and pumicite, by James A. Adams.

Shp-07 1942 Geologic history of the Portland area, by Ray C. Treasher.

Shp-08 1942 Strategic and critical minerals: A guide for Oregon prospectors, by Lloyd W. Staples.

Shp-09 1942 Some manganese deposits in the southern Oregon coastal region, by Randall E. Brown.

Shp-10 1943 An investigation of the Tyrell manganese deposit and other similar properties in the Lake Creek District, Oregon, by W.D. Lowry and C. F. Wray.

Shp-11 1943 Notes on some mineral deposits in the area surrounding the junction of the Snake and Imnaha rivers in Oregon, by F. W. Libbey.

Shp-12 1944 Preliminary report on high alumina iron ores in Washington County, Oregon, by F. W. Libbey, Wallace D. Lowry, and Ralph S. Mason.

Shp-13 1944 Antimony in Oregon, by Norman S. Wagner.

Shp-14 1946 Notes on building-block materials of eastern Oregon, by Norman S. Wagner.

Shp-15 1946 Reconnaissance geology of limestone deposits in the Willamette Valley, Oregon, by John Eliot Allen.

Shp-16 1946 Perlite deposits near the Deschutes River, southern Wasco County, Oregon, by John Eliot Allen.

Shp-17 1947 Sodium salts of Lake County, Oregon, by Ira S. Allison and Ralph S. Mason.

Shp-18	1976, 4th rev.	Radioactive minerals the prospector should know, by David J. White and Max Schafer, 3rd rev.; Norman V. Peterson, 4th rev.
Shp-19	1949	Brick and tile industry in Oregon, by John Eliot Allen and Ralph S. Mason.
Shp-20	1950	Glazes from Oregon volcanic glass, by Charles W. F. Jacobs.
Shp-22	1951	Preliminary report on tungsten in Oregon, by Harold D. Wolfe and David J. White.
Shp-23	1962	The Oregon King mine, Jefferson County, Oregon, by F. W. Libbey and Raymond E. Corcoran.
Shp-24	1967	The Almeda mine, Josephine County, Oregon, by F. W. Libbey.
Shp-25	1976	Petrography of the Rattlesnake Formation at the type area, central Oregon, by Harold E. Enlows.
Shp-26	1976	Rock material resources of Umatilla County, Oregon, by Herbert G. Schlicker, Robert A. Schmuck, and Jerry J. Gray.
Shp-27	1978	Rock material resources of Benton County, Oregon, by Herbert G. Schlicker, Jerry J. Gray, and James L. Bela.

Special Papers

SP-02	1978	Field geology of S.W. Broken Top quadrangle, Oregon, by Edward M. Taylor.
SP-03	1978	Rock material resources of Clackamas, Columbia, Multnomah, and Washington Counties, Oregon, by Jerry J. Gray, Garwood R. Allen, and Gregory S. Mack.
SP-04	1978	Heat flow of Oregon, by David D. Blackwell, Donald A. Hull, Richard G. Bowen, and John L. Steele.
SP-05	1979	Analysis and forecasts of the demand for rock materials in Oregon, by Julia M. Friedman, Ernest G. Niemi, and W. Ed Whitelaw.
SP-06	1980	Geology of the La Grande Area, Oregon, by Warren Barrash, John G. Bond, John D. Kauffman, and Ramesh Venkatakrishnan.
SP-07	1979	Pluvial Fort Rock Lake, Lake County, Oregon, by Ira S. Allison.
SP-08	1980	Geology and geochemistry of Mt. Hood Volcano, by Craig M. White.
SP-09	1980	Geology of the Breitenbush Hot Springs quadrangle, Oregon, by Craig M. White.
SP-10	1980	Tectonic rotation of the Oregon Western Cascades, by James Magill and Allan Cox.
SP-11	1982	Theses and dissertations on the geology of Oregon, by Klaus K. E. Neuendorf, Kathleen A. Mahoney, and Paul E. Staub.
SP-12	1980	Geological linears of the northern part of the Cascade Range, Oregon, by Ramesh Venkatakrishnan, John G. Bond, and John D. Kauffman.
SP-13	1981	Faults and lineaments of the Southern Cascades, Oregon, by C. F. Kienle, C. A. Nelson, and R. D. Lawrence.
SP-14	1982	Geology and geothermal resources of the Mount Hood area, Oregon, by George R. Priest and Beverly F. Vogt (eds.).
SP-15	1983	Geology and geothermal resources of the central Oregon Cascade Range, by George R. Priest and Beverly F. Vogt (eds).
SP-16	1983	Index to the Ore Bin (1939-1978) and Oregon Geology (1979-1982), by Kathleen A. Mahoney and Margaret L. Steere.
SP-17	1984	Bibliography of Oregon paleontology, 1972-1983, by Elizabeth L. Orr and William N. Orr.
SP-18	1988	Investigations of talc in Oregon, by Mark L. Ferns and Len Ramp.
SP-19	1989	Limestone deposits in Oregon, by Howard C. Brooks, and Gary L. Baxter.
SP-20	1989	Bentonite in Oregon: Occurrences, analyses, and economic potential, by Jerry J. Gray, Ronald P. Geitgey, and Gary L. Baxter.
SP-21	1987	Field geology of the northwest quarter of the Broken Top 15 minute quadrangle, Deschutes County, Oregon, by Edward M. Taylor.
SP-22	1990	Silica in Oregon, by Ronald P. Geitgey and Gary L. Baxter.
SP-23	1990	Industrial rocks and minerals of the Pacific Northwest: Proceedings of the 25th Forum on the Geology of Industrial Minerals, April 30 to May 2, 1989, Portland, Oregon, by Ronald P. Geitgey and Beverly F. Vogt (eds.).
SP-24	1990	Index to Proceedings of the Forum on the Geology of Industrial Minerals, First (1965) through Twenty-Fifth (1989), by Robert L. Bates (comp.).
SP-25	1992	Pumice in Oregon, by Ronald P. Geitgey.
SP-26	1992	Onshore-offshore geologic cross section, northern Oregon Coast Range to Continental Slope, by Alan R. Niem, Norman S. MacLeod, Parke D. Snavely, Jr., David Huggins, J. Daniel Fortier, H. Jack Meyer, Alan Seeling, and Wendy A. Niem.
SP-27	1995	An economic analysis of construction aggregate markets and the results of a long-term forecasting model for Oregon, by Robert M. Whelan.

Digital Data Series

MILO	2010	Mineral information layer for Oregon, Release 2 (MILO-2), by Clark A. Niewendorp and Ronald P. Geitgey, comp.
GILO	2005	Geoanalytical information layer for Oregon (GILO), release 1, by Mark L. Ferns and Vicki S. McConnell.
OGDC-1	2005	Oregon geologic data compilation [OGDC], release 1 (northeast Oregon), by Margaret D. Jenks, Paul E. Staub, Mark L. Ferns, Ian P. Madin, Lina Ma, and Ron P. Geitgey. *Superseded by OGDC-2.*
OGDC-2	2006	Oregon geologic data compilation [OGDC], release 2 (southeast and northeast Oregon), by Margaret D. Jenks, Clark A. Niewendorp, Mark L. Ferns, Ian P. Madin, Paul E. Staub, Lina Ma, and Ron P. Geitgey. *Superseded by OGDC-3.*
OGDC-3	2007	Oregon geologic data compilation [OGDC], release 3 (central, southeast, and northeast Oregon), by Clark A. Niewendorp, Margaret D. Jenks, Mark L. Ferns, Ian P. Madin, Paul E. Staub, and Lina Ma. *Superseded by OGDC-4.*
OGDC-4	2008	Oregon geologic data compilation [OGDC], release 4 (southwest, central, southeast, northeast Oregon), by Margaret D. Jenks, Thomas J. Wiley, Mark L. Ferns, Paul E. Staub, Lina Ma, Ian P. Madin, Clark A. Niewendorp, Rudie J. Watzig, Edward M. Taylor, and Stanley A. Mertzman (compilers). *Superseded by OGDC-5.*
OGDC-5	2009	Oregon geologic data compilation [OGDC], release 5 (statewide), by Lina Ma, Ian P. Madin, Keith V. Olson, Rudie J. Watzig, Ray E. Wells, Alan R. Niem, and George R. Priest (compilers). *Superseded by OGDC-6.*
OGDC-6	2015	Oregon geologic data compilation [OGDC], release 6 (statewide), by compiled by Rachel L. Smith and Warren P. Roe.
GTILO	2012	Geothermal Information Layer for Oregon, release 2 (GTILO-2), by Clark A. Niewendorp, Tracy R. Ricker, Kelley W. Rabjohns, and Shane H. Brodie.
OHMI	2011	Oregon Historical Mining Information archive (OHMI).
RAILO-1	2013	Radiometric Age Information Layer for Oregon, release 1 (RAILO-1), by Tracy R. Ricker and Clark A. Niewendorp.
AQILO-1	2013	Aqueous Chemistry Information Layer for Oregon, Release 1 (AQILO-1), by Tracy R. Ricker and Clark A. Niewendorp.
VVO-1	2013	Volcanic Vents of Oregon, Release 1 (VVO-1), by Sarah R. Doliber and Clark A. Niewendorp.
TIRILO-1	2013	Thermal Infrared Information Layer for Oregon, release 1 (TIRILO-1), by Clark A. Niewendorp, compiler.
GTILO	2013	Geothermal Information Layer for Oregon, release 2 (GTILO-2).

Web Maps

MILO	Mineral Information Viewer for Oregon
GTILO-2	Geothermal Information Layer for Oregon
OHMI	Oregon Historical Mining Information

Ore Bin / Oregon Geology Articles

OBv04 n10	1942	Fluorescent light mineralogy, by R. C. Treasher.
OBv04 n08	1942	Treasury Department vs. production of critical minerals, by S. H. Williston.
OBv04 n09	1942	Salting, by R. G. Bassett.
OBv05 n10	1943	Humphreys spiral gravity concentrator treats Oregon black sands, by J. E. Allen.
OBv05 n11	1943	The small miner - finish!, by E. K. Nixon.
OBv05 n03	1943	Columbium and tantalum, by J. P. Fitzsimmons.
OBv05 n07	1943	Sponge iron, by H. A. Brassert.
OBv05 n08	1943	Aluminum from clay, by F. W. Libbey.
OBv05 n09	1943	Ceramics, by E. W. Miller.
OBv06 n10	1944	Northwest source of alumina vital, by M. L. Bingham.
OBv06 n12	1944	Auger hole prospecting, by R. S. Mason.
OBv06 n05	1944	Microchemistry in research and industry, by H. C. Harrison.
OBv06 n06	1944	Fluorspar, by J. B. Priestaf.
OBv06 n08	1944	Mineral discovery hamstrung in western Oregon, by S. H. Williston.
OBv07 n01	1945	Ferruginous bauxite in Washington County, Oregon, by F. W. Libbey.
OBv07 n01	1945	A high-flying bird's eye view of Permanente Metals Corporation magnesium and associated plants, by J. E. Allen.
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OBv07 n10	1945	Ceramic testing, by E. W. Miller.
OBv07 n11	1945	Plain geology, by G. O. Smith.
OBv07 n02	1945	The Eugene silica foundry sand, by W. D. Lowry.
OBv07 n08	1945	Uranium notes, by J. E. Allen.
OBv08 n01	1946	Diatomite, by E. M. Baldwin.
OBv08 n12	1946	The copper content of certain Oregon mine waters, by W. E Caldwell and D. Sumner.
OBv08 n04	1946	An aluminum primer, by F. W. Libbey.
OBv08 n06	1946	Bloated volcanic ash and tuff new light-weight material, or is Oklahoma volcanic ash just so much dirt?, by A. L. Burwell.
OBv08 n07	1946	Fused quartz, by R. B. Ladoo.
OBv08 n08	1946	Birch Creek cinder occurrence, Baker County, Oregon, by N. S. Wagner.
OBv08 n08	1946	The mining industries, by W. C. Broadgate.
OBv08 n09	1946	Mining and mail, by L. A. McArthur.
OBv09 n11	1947	The mines of Laurium, by E. De Golyer.
OBv09 n12	1947	A reconnaissance between the Almeda and Silver Peak mines of southwestern Oregon, by H. M. Dole and E. M. Baldwin.
OBv09 n03	1947	Nickel-bearing laterite, Red Flat, Curry County, Oregon, by F. W. Libbey, W. D. Lowry, and R. S. Mason.
OBv09 n04	1947	The lightweight aggregate, pumice, by N. S. Wagner.
OBv09 n06	1947	Some geological aspects of the Grants Pass quadrangle, by E. C. Annes.
OBv09 n07	1947	Gem mining--a new Oregon industry, by Henry Carl Dake.
OBv09 n08	1947	Another perlite deposit in Oregon, by J. E. Allen.
OBv09 n09	1947	Sodium chloride brine occurrence near Vale, Oregon, by N. S. Wagner.
OBv10 n10	1948	Status of the strategic metals industries, by S. H. Williston.
OBv10 n10	1948	Specifications for ceramic materials, by C. W. F. Jacobs.
OBv10 n12	1948	A review of Oregon mining in 1948, by F. W. Libbey.
OBv10 n02	1948	Oregon's mining industry, by F. W. Libbey.
OBv10 n03	1948	The domestic mercury situation, by S. H. Williston.
OBv10 n03	1948	New method of obtaining undisturbed soil samples, by R. S. Mason.
OBv10 n05	1948	Nickel-bearing laterite areas of southwestern Oregon, by H. M. Dole, F. W. Libbey, and R. S. Mason.
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