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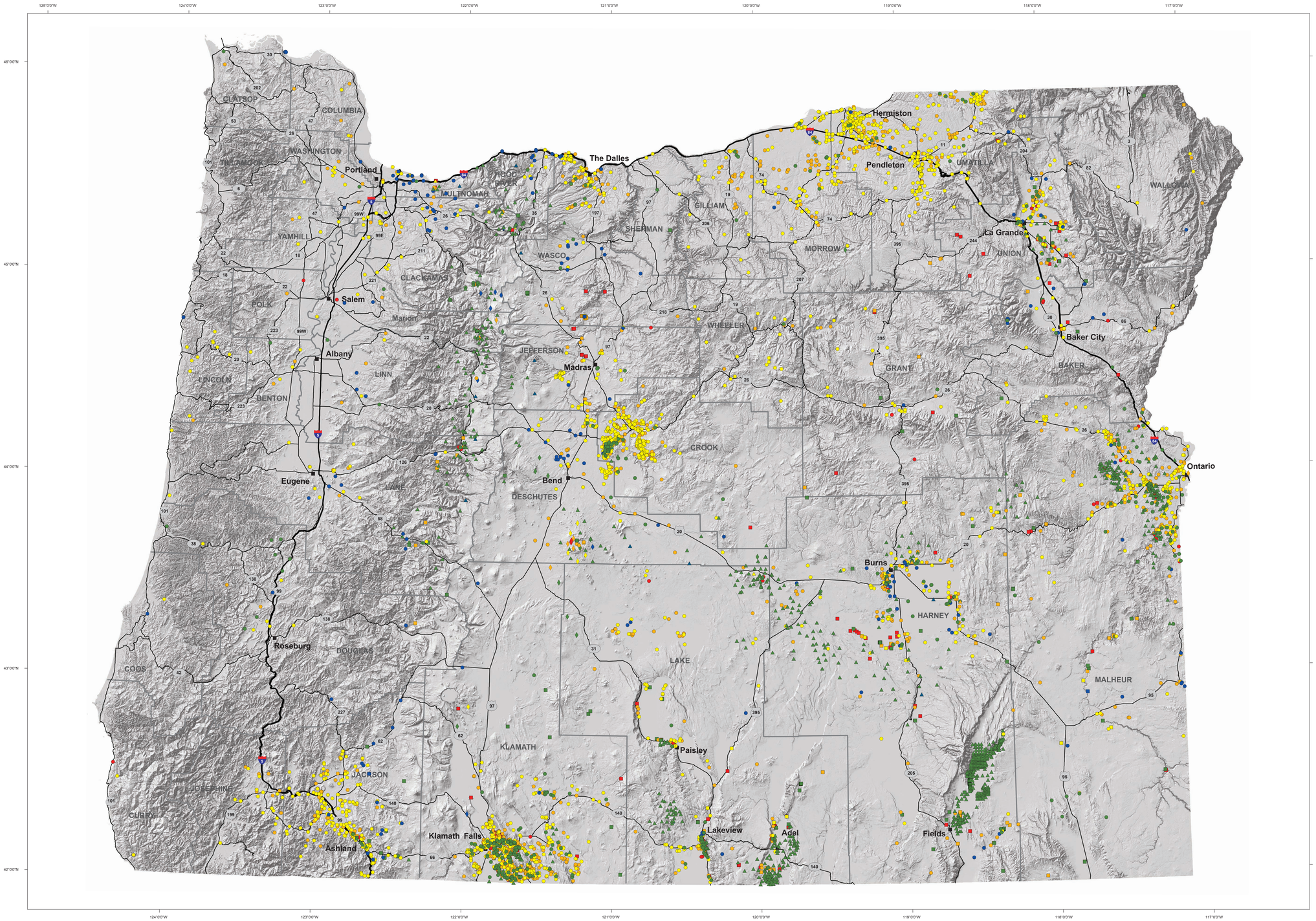
# GEOTHERMAL INFORMATION LAYER FOR OREGON — RELEASE 2

2012




Map Projection Information:
Projection: Lambert Conformal Conic
Units: International Feet
Central Meridian: -121.00
Standard Parallel: 1: 43.00
Standard Parallel: 2: 45.5
Latitude of Oregon: 42.00
Datum: North American 1983

SCALE 1:500 000

10 0 10 20 30 40 MILES

10 0 10 20 30 40 50 KILOMETERS

GTILO—Release 2 compiled by Clark A. Niewendorp, Tracy R. Ricker, Kelley W. Rabjohns, and Shane H. Brodie
Oregon Department of Geology and Mineral Industries
2012

## GEOTHERMAL INFORMATION LAYER FOR OREGON — RELEASE 2

(GTILO — Release 2)

By Clark A. Niewendorp, Tracy R. Ricker, Kelley W. Rabjohns, and Shane H. Brodie

**PLATE 1**

**NOTICE**

This map cannot serve as a substitute for site-specific investigations by qualified practitioners.
Site-specific data may give results that differ from those shown on the map.
The views and conclusions contained in this document are those of the authors.

### INTRODUCTION

The Geothermal Information Layer for Oregon (GTILO) is the Oregon Department of Geology and Mineral Industries (DOGAMI) geospatial database system that currently stores and manages Oregon's geothermal resource information. In this release of GTILO (GTILO-Release 2), there are two Esri shapfiles called GTILO-2_Geothermalspring_database and GTILO-2_Geothermalwell_database. A brief description of the data each shapefile contains is provided below. This map displays these data and shows those areas in Oregon that either have been investigated for geothermal resource potential or show potential for a geothermal resource. Please read each shapefile's metadata and visit http://www.oregongeology.org for addition details.

**GTILO-2_Geothermalspring_database:**

**Hot and Warm Springs**
There are 690 points on this map that represent Oregon's thermal springs. These springs are produced by the emergence of geothermally heated groundwater and defined in most cases as those having temperatures greater than 20°C (68°F), or a minimum temperature of 10°C (50°F) above mean annual air temperature. This database also lists springs with temperature information listed only as "warm" or "hot" and springs having temperatures greater than 18.3°C (65°F) information. Understand that there is no universally accepted definition of a thermal spring.

A characteristic of thermal springs in Oregon is that they usually represent a group of affiliated springs. In previous studies, it was customary to count each spring group but not every spring in that group. Where possible, we counted each spring in a group but only when several spring locations, which would have been otherwise included in a group, were separately shown on a U.S. Geological Survey 1:24,000-scale quadrangle map or indicated in some other previous studies.

**GTILO-2_Geothermalwell_database:**

**Low-Temperature Wells**
There are 4,344 points shown on this map that represent various types of low-temperature wells (e.g., domestic/irrigation/other water supply wells) throughout Oregon. Low-temperature wells are defined as those wells within which there is water in the borehole having a temperature greater than 18.3°C (65°F) or a minimum temperature of slightly less than 10°C above mean annual air temperature, and wells that are at least 60 ft (18.3 m) deep. Understand that there is no universally accepted definition for a low-temperature well, in terms of the temperature of the water that it contains or depth that it was drilled. Water temperature is reported by the driller; the means by which it was acquired is entirely unknown.

**Geothermal Prospect Wells**
There are 1,019 points on this map that represent geothermal prospect wells in Oregon. A geothermal prospect well is defined as any well drilled as a geophysical test well, seismic shot hole, mineral exploration drilling, core drilling, or temperature gradient test well, less than 2,000 ft (667 m) in depth, and drilled in prospecting for geothermal resources.

**Geothermal Wells**
Sixty-six boreholes were drilled as geothermal wells for producing geothermal resources and includes any geothermal re-injection wells.

**Data Sources**

The data depicted on this map are attributed partly to the following sources:

- Geo-Heat Center Western States Geothermal Databases CD-ROM.
- Geothermal Areas Database of the U.S.
- Geothermal information from the United States Geological Survey (USGS) online database.
- Southern Methodist University (SMU) Geothermal Laboratory online database.
- Great Basin Center for Geothermal Research, University of Nevada, Reno, online database.
- University of Idaho, Department of Geological Sciences, Moscow, Idaho.
- United States Geological Survey Geographic Names Information System and National Hydrography Dataset.
- DOGAMI Mineral Land Reclamation and Regulation program, Albany, Oregon, files of geothermal prospect permits and geothermal well permits.
- Oregon Water Resources Division (OWRD) water well database.
- DOGAMI unpublished and published geothermal reports, maps, and databases, accuracy of which varies according to the original source(s).

See the metadata files for more detailed source information.

**Data Access**

Free access to data used in GTILO—Release 2 can be obtained at http://repository.usgin.org/collection. Please contact the Nature of the Northwest Information Center to purchase GTILO—Release 2.

Understand that these data are provided "as-is" without warranty of any kind, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The user assumes all responsibility for the accuracy and suitability of these data for a specific application. In no event will the Oregon Department of Geology and Mineral Industries be liable for any damages, including lost profits, lost savings, or other incidental or consequential damages arising from the use of or inability to use the data.

### EXPLANATION OF MAP UNITS

**Thermal Springs**
(maximum temperature reported)

- Spring temperature not available
- ≤18.3°C (64.9°F) thermal spring
- 18.31°C (64.9°F) – 20°C (68°F) thermal spring
- 20.1°C (68.18°F) – 35°C (95°F) thermal spring
- 35.1°C (95.18°F) – 99°C (210.2°F) thermal spring

**Low-Temperature Wells**
(maximum temperature reported)

- Temperature not available or reported
- ≤18.3°C (64.9°F) low-temperature well
- 18.31°C (64.9°F) – 20°C (68°F) low-temperature well
- 20.1°C (68.18°F) – 35°C (95°F) low-temperature well
- 35.1°C (95.18°F) – 121°C (249.8°F) low-temperature well

**Geothermal Prospect Wells**
(maximum temperature reported)

- Temperature not available or reported
- ≤18.3°C (64.9°F) geothermal prospect well
- 18.31°C (64.9°F) – 20°C (68°F) geothermal prospect well
- 20.1°C (68.18°F) – 35°C (95°F) geothermal prospect well
- 35.1°C (95.18°F) – 121°C (249.8°F) geothermal prospect well

**Geothermal Wells**
(maximum temperature reported)

- Temperature not available or reported
- ≤47.2°C (116.96°F) geothermal well
- 47.3°C (117.14°F) – 107.1°C (224.78°F) geothermal well
- 107.2°C (224.96°F) – 182.8°C (361.04°F) geothermal well
- 182.9°C (361.22°F) – 294°C (561.2°F) geothermal well

**LEGEND**

- Interstate freeway
- U.S. highway
- State highway
- City/town
- County boundary

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