

COLORADO GEOLOGICAL SURVEY

Map Series MS-51

Interpretive Geothermal Gradient Map of Colorado

INTRODUCTION

The Interpretive Geothermal Gradient Map of Colorado depicts the change in temperature with depth below the Earth's surface throughout Colorado. Geothermal gradient values quantify the depth-temperature relationship used in evaluating geothermal resource potential. Geothermal gradient data are one of several types of data that indicate the quality of geothermal resources in an area. Other data types that are useful in assessing geothermal resources include geothermal heat flow, geothermometry, geophysical data (electrical, magnetic, magnetotelluric, gravity, remote sensing), and shallow-depth ground temperature measurements.

This publication compiles geothermal gradient data from several sources. These include past CGS geothermal publications, national and global heat flow databases, and Colorado oil, gas, and CO₂ well data. Despite the abundant data used to create this map, the data points are distributed irregularly throughout the state. Some map areas lack significant data control and, therefore, are considered interpretive. The Interpretive Geothermal Gradient Map of Colorado is useful for geothermal resource exploration, especially when used in conjunction with other types of geological, geophysical, and hydrogeological data.

The ZIP file contains three map plates, two report documents, a geothermal gradient database, and the native Geographic Information System (GIS) geospatial data files through which, the interpretive geothermal gradient maps and projected temperature-at-depth maps were created.

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HOW TO USE THIS ZIP FILE

To open the compressed (.zip) file that you downloaded, double-click on the file. Inside the folder labeled **MS-51**, there are a number of files and folders. Some files are stored in Adobe Portable Document (.pdf) format, others in Microsoft Excel (.xls) format. Geographic Information Systems (GIS) data are also included. These data are in ESRI's Shapefile and Geodatabase format.

HOW TO IDENTIFY AND READ FILES

REPORT DOCUMENTS

- **MS-51-Read_Me.pdf**
This file
- **MS-51 Plate 1 - Interpretive Geothermal Gradient Map of Colorado.pdf**
- **MS-51 Plate 2 - Interpretive Geothermal Gradient Map of Colorado with Land Status.pdf**

- **MS-51 Plate 3 - Projected Temperatures At Depth.pdf**
- **MS-51 Colorado Geothermal Gradient Database.xls**
- **MS-51 Description of Colorado Geothermal Gradient Database.pdf**
- **MS-51 Report - Interpretive Geothermal Gradient Map of Colorado.pdf**
- **GIS_Data folder**
Contains Geodatabase, Shape, Layer, Raster,

To view .pdf files

If you don't already have Adobe Reader installed on your device, visit <https://get.adobe.com/reader/> to download a free version of the software. Then, start Adobe Reader and choose "File," "Open," and locate the .pdf files where you downloaded them, they will open in Adobe Reader.

To view GIS files

GIS files may be viewed using Geographic Information Systems software packages such as ESRI's ArcGIS platform. Alternatively, these files may be viewed using QGIS, a free and open-source GIS software package, available for download at <https://qgis.com>. Shapefiles are located in the GIS_Data folder and can be viewed with most GIS software packages. Metadata is associated with the Shapefiles and is best viewed using the Metadata tab in ESRI's ArcCatalog.

For further information or assistance visit or call the Colorado Geological Survey at:

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