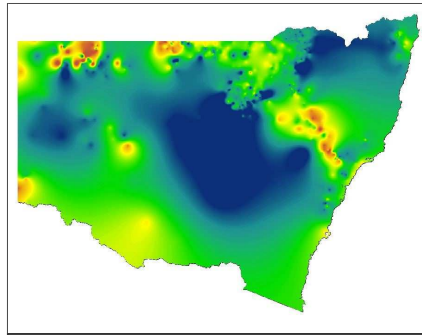


NSW Geothermal Temperature Map 3km

File Geodatabase Raster Dataset



Tags

NSW, Geothermal, Temperature Map, Raster

Summary

This raster dataset shows the calculated temperatures of the underlying geology at 3km depth. The dataset is represented here as a NSW statewide geothermal temperature map at 3km depth.

Description

The Geological Survey of NSW developed the Geothermal Borehole Database and geothermal 2, 3 and 5km temperature maps in 2015-2016 as part of the renewable energy resource maps for the NSW Renewable Energy Action Plan, Annual Report 2015. The aim of the Geothermal Borehole Database and the renewable energy resource and maps were to;

- (i) Develop an up-to-date NSW borehole temperature database from all available internal and external data sources
- (ii) Extrapolate temperature readings from varying depths to 2, 3 and 5km levels using calculations
- (iii) Produce statewide temperature maps from the Geothermal Borehole Database for 2, 3 and 5km depths illustrating high and low temperature areas.

Credits

Nelson, M.D.
Jaworska, J.
Gammidge, L.

Use limitations

Please refer to the 'Resource Constraints' section for limitations of use.

Extent

West	140.999280	East	153.638340
North	-28.157340	South	-37.509165

Scale Range

Maximum (zoomed in)	1:5,000
Minimum (zoomed out)	1:150,000,000

ArcGIS Metadata ►

Topics and Keywords ►

THEMES OR CATEGORIES OF THE RESOURCE [geoscientificInformation](#)

* CONTENT TYPE [Downloadable Data](#)

EXPORT TO FGDC CSDGM XML FORMAT AS RESOURCE DESCRIPTION [No](#)

THEME KEYWORDS [RENEWABLES-Geothermal](#)

[Hide Topics and Keywords ▲](#)

Citation ►

TITLE [NSW Geothermal Temperature Map 3km](#)

PUBLICATION DATE [2016-07-25 00:00:00](#)

REVISION DATE [2018-11-30 00:00:00](#)

EDITION [1.3](#)

EDITION DATE [2018-11-30](#)

PRESENTATION FORMATS [digital map](#)

FGDC GEOSPATIAL PRESENTATION FORMAT [raster digital data](#)

OTHER CITATION DETAILS

It is recommended that this dataset be referred to as:

Wade S.L., Barry C.M., Nelson M.D. & Gammridge L. (compilers) 2018. Renewable energy map of New South Wales, Version 1.3 (Digital Dataset). Geological Survey of New South Wales, Maitland.

[Hide Citation ▲](#)

Citation Contacts ►

RESPONSIBLE PARTY

INDIVIDUAL'S NAME [Director of Geoscience Information,](#)

ORGANIZATION'S NAME [NSW Resources and Geoscience, Geological Survey of NSW](#)

CONTACT'S ROLE [publisher](#)

CONTACT INFORMATION ►

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TYPE [physical](#)

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ONLINE RESOURCE

LOCATION <http://www.resourcesandgeoscience.nsw.gov.au>

NAME [NSW Resources and Geoscience website](#)

DESCRIPTION [The website of the NSW Department of Planning & Environment, Division of Resources and Geoscience](#)

FUNCTION PERFORMED information

[Hide Contact information ▲](#)

[Hide Citation Contacts ▲](#)

Resource Details ►

DATASET LANGUAGES * English (AUSTRALIA)
DATASET CHARACTER SET utf8 - 8 bit UCS Transfer Format

STATUS completed
SPATIAL REPRESENTATION TYPE * grid

* PROCESSING ENVIRONMENT Version 6.2 (Build 9200) ; Esri ArcGIS 10.4.0.5524

CREDITS

Nelson, M.D.
Jaworska, J.
Gammidge, L.

ARCGIS ITEM PROPERTIES

* NAME Geothermal_Temp_Map_At_3km
* LOCATION file:///\\Maitlfp11
\\group\Geosurvey\GeoInfo\GeoSpatial\Products\Mapping\State\NSW Renewables\2019
\Online data\ArcGIS\RenewablesData.gdb
* ACCESS PROTOCOL Local Area Network

[Hide Resource Details ▲](#)

Extents ►

EXTENT

GEOGRAPHIC EXTENT

BOUNDING RECTANGLE

EXTENT TYPE Extent used for searching
* WEST LONGITUDE 140.999280
* EAST LONGITUDE 153.638340
* NORTH LATITUDE -28.157340
* SOUTH LATITUDE -37.509165
* EXTENT CONTAINS THE RESOURCE Yes

EXTENT IN THE ITEM'S COORDINATE SYSTEM

* WEST LONGITUDE 140.999280
* EAST LONGITUDE 153.638340
* SOUTH LATITUDE -37.509165
* NORTH LATITUDE -28.157340
* EXTENT CONTAINS THE RESOURCE Yes

[Hide Extents ▲](#)

Resource Points of Contact ►

POINT OF CONTACT

INDIVIDUAL'S NAME Director of Geoscience Information,
ORGANIZATION'S NAME NSW Resources and Geoscience, Geological Survey of NSW
CONTACT'S ROLE publisher

CONTACT INFORMATION ►
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E-MAIL ADDRESS geoscience.info@geoscience.nsw.gov.au

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LOCATION <http://www.resourcesandgeoscience.nsw.gov.au>
NAME NSW Resources and Geoscience website
DESCRIPTION The website of the NSW Department of Planning & Environment, Division of Resources and Geoscience
FUNCTION PERFORMED information

[Hide Contact information ▲](#)

[Hide Resource Points of Contact ▲](#)

Resource Maintenance ►

RESOURCE MAINTENANCE

UPDATE FREQUENCY unknown

SCOPE OF THE UPDATES dataset

[Hide Resource Maintenance ▲](#)

Resource Constraints ►

LEGAL CONSTRAINTS

LIMITATIONS OF USE

THE FOLLOWING LIMITATION APPLIES TO THE DERIVATIVE WORKS AND PLATFORM OF DELIVERY:

<http://www.planning.nsw.gov.au/Copyright-and-Disclaimer>

CONSTRAINTS

LIMITATIONS OF USE

Please refer to the 'Resource Constraints' section for limitations of use.

[Hide Resource Constraints ▲](#)

Spatial Reference ►

ARCGIS COORDINATE SYSTEM

- * TYPE Geographic
- * GEOGRAPHIC COORDINATE REFERENCE GCS_GDA_1994
- * COORDINATE REFERENCE DETAILS
 - GEOGRAPHIC COORDINATE SYSTEM
 - WELL-KNOWN IDENTIFIER 4283
 - X ORIGIN -400
 - Y ORIGIN -400
 - XY SCALE 11258999068426.238
 - Z ORIGIN -100000
 - Z SCALE 10000

M ORIGIN -100000
M SCALE 10000
XY TOLERANCE 8.9831528411952133e-009
Z TOLERANCE 0.001
M TOLERANCE 0.001
HIGH PRECISION true
LEFT LONGITUDE -180
LATEST WELL-KNOWN IDENTIFIER 4283
WELL-KNOWN TEXT GEOGCS["GCS_GDA_1994",DATUM["D_GDA_1994",SPHEROID
["GRS_1980",6378137.0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT
["Degree",0.0174532925199433],AUTHORITY["EPSG",4283]]

REFERENCE SYSTEM IDENTIFIER

- * VALUE 4283
- * CODESPACE EPSG
- * VERSION 8.3.4(3.0.1)

[Hide Spatial Reference ▲](#)

Spatial Data Properties ►

ARCGIS RASTER PROPERTIES ►

GENERAL INFORMATION

- * PIXEL DEPTH 32
- * COMPRESSION TYPE None
- * NUMBER OF BANDS 1
- * RASTER FORMAT GRID
- * SOURCE TYPE continuous
- * PIXEL TYPE floating point
- * NO DATA VALUE -3.4028231e+038
- * HAS COLORMAP No
- * HAS PYRAMIDS Yes

[Hide ArcGIS Raster Properties ▲](#)

[Hide Spatial Data Properties ▲](#)

Data Quality ►

SCOPE OF QUALITY INFORMATION ►

RESOURCE LEVEL dataset

[Hide Scope of quality information ▲](#)

DATA QUALITY REPORT - ABSOLUTE EXTERNAL POSITIONAL ACCURACY ►

DIMENSION vertical

MEASURE NAME GSNSW testing and editing

CONFORMANCE TEST RESULTS

TEST PASSED Yes

RESULT EXPLANATION

Geological data used in the creation of the Temperature map raster was sourced from the Geothermal Borehole Database and hence is subjected to the same accuracy levels. Boreholes that didn't meet the specific selection criteria for each level were not included in the creation of the raster Temperature map.

[Hide Data quality report - Absolute external positional accuracy ▲](#)

DATA QUALITY REPORT - COMPLETENESS OMISSION ►

MEASURE NAME GSNSW testing and editing

CONFORMANCE TEST RESULTS

TEST PASSED Yes

RESULT EXPLANATION

Boreholes that didn't meet the specific selection criteria for each level were not included in the creation of the raster Temperature map due to inaccuracies or potential errors in the original data. Confidential Boreholes were used in the creation of the Temperature map but are not included in the point database.

[Hide Data quality report - Completeness omission ▲](#)

[Hide Data Quality ▲](#)

Lineage ►

LINEAGE STATEMENT

Note the following refers to the Geothermal Borehole Database, which was used to develop the NSW statewide geothermal temperature map at 3km depth:

Calculating temperature at 2, 3 and 5km was achieved by using the following methods for different types of data.

1. A single temperature reading at depth - the following equation was used
Geothermal gradient (per km) = $((\text{Raw Temp_C} - \text{Surface_Soil Correction}) * 1000 / \text{Depth of Temp})$.

Temperature at 2km = $(\text{Geothermal gradient} * 2) + \text{Surface/Soil Correction}$.
Temperature at 3km = $(\text{Geothermal gradient} * 3) + \text{Surface/Soil Correction}$.
Temperature at 5km = $(\text{Geothermal gradient} * 5) + \text{Surface/Soil Correction}$.

**Note. All values use the calculated equation as selection criteria to determine if that value will be mapped - see Temperature Selection Criteria

2. Two temperature readings at various depths - the above method was used on the most reliable data. The author compared the two data points and chose the most reliable data to be mapped. The selection was made using a hierarchy system in which the most reliable data included a higher reliability ranking, more accurate testing method, greater TSC recording (Time since circulation) or the depth value closest to 3km.

3. Three or more temperature readings at various depths - the line of best fit method was used. A line of best fit was plotted and the Slope and Intercept was calculated. Using the Slope and Intercept, temperature at 2,3 and 5km was calculated using $y = mx + b$. In the case in which a temperature value plotted markedly differently to the others from the same borehole that value was omitted from the Slope and Intercept calculations.

Temperature Selection Criteria

Due to the unconsolidated nature of sediments and the frequent presence of shallow aquifers, minimum depth and temperature values for each geothermal temperature map (2, 3 and 5km) were used as selection criteria to eliminate unrealistic data values. Individual boreholes were analysed and had to meet both criteria ranges to be included in each temperature map creation. As outlined below.

2km map; Raw temperature depth reading >250m, calculated temperature at 2km >30 C

3km map: Raw temperature depth reading >500m, calculated temperature at 2km >30 C

5km map: Raw temperature depth reading >1000m, calculated temperature at 2km >30 C

For more information please contact: geoscience.info@geoscience.nsw.gov.au

Note the following refers to the NSW statewide geothermal temperature map at 3km depth:

The NSW statewide geothermal temperature map at 3km depth was created using ERSI ArcGIS, ArcToolbox, Spatial Analyst, Interpolation and the Topo to Raster tool. The selected derived temperature values at 3km depth (as outlined above from the Geothermal Borehole Database) were used for the interpolation process.

The following specifics were used to create the 3km Temperature map as they produced the most realistic representation.

(i) Cell Size X, Y; 0.00599

(ii) Pyramids; Level 4, resampling: Nearest Neighbor

(iii) Symbology; Stretched, Stretch Type: Percent Clip - min: 10 max: 0.1

Note: Clipping of the raster image results in a resampling of the underlying data. Resampling calculates new statistics based on the clipped extent, and can result in slightly different min, max, mean and standard deviation values. These differences do not change the overall image of the raster, and are within accepted standard error ranges.

Note: This dataset has been reviewed as part of the NSW Renewable Energy Mapping Project update (version 1.3, November 2018), with no updates required.

[Hide Lineage ▲](#)

Geoprocessing history ▼

Distribution ►

DISTRIBUTOR ►

CONTACT INFORMATION

INDIVIDUAL'S NAME Director of Geoscience Information,
ORGANIZATION'S NAME NSW Resources and Geoscience, Geological Survey of NSW
CONTACT'S ROLE publisher

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ONLINE RESOURCE

LOCATION <http://www.resourcesandgeoscience.nsw.gov.au>
NAME NSW Resources and Geoscience website
DESCRIPTION The website of the NSW Department of Planning & Environment, Division of Resources and Geoscience
FUNCTION PERFORMED information

[Hide Contact information ▲](#)

[Hide Distributor ▲](#)

DISTRIBUTION FORMAT

* NAME File Geodatabase Raster Dataset

VERSION 10.3.1

[Hide Distribution ▲](#)

References ►

PORTRAYAL CATALOGUE CITATION ►

TITLE NSW Geothermal Temperature Map 3km

PUBLICATION DATE 2016-07-25 00:00:00

REVISION DATE 2018-11-30 00:00:00

EDITION 1.3

EDITION DATE 2018-11-30

PRESENTATION FORMATS digital map

FGDC GEOSPATIAL PRESENTATION FORMAT raster digital data

OTHER CITATION DETAILS

It is recommended that this dataset be referred to as:

Wade S.L., Barry C.M., Nelson M.D. & Gammridge L. (compilers) 2018. Renewable energy map of New South Wales, Version 1.3 (Digital Dataset). Geological Survey of New South Wales, Maitland.

[Hide Portrayal catalogue citation ▲](#)

[Hide References ▲](#)

Metadata Details ►

* METADATA LANGUAGE English (AUSTRALIA)

METADATA CHARACTER SET utf8 - 8 bit UCS Transfer Format

METADATA IDENTIFIER 8CA98ECD-0F74-4F5E-A320-429031CE1649

SCOPE OF THE DATA DESCRIBED BY THE METADATA dataset

SCOPE NAME * dataset

* LAST UPDATE 2019-02-14

ARCGIS METADATA PROPERTIES

METADATA FORMAT ArcGIS 1.0

STANDARD OR PROFILE USED TO EDIT METADATA ISO19139

CREATED IN ARCGIS FOR THE ITEM 2016-02-03 13:08:46

LAST MODIFIED IN ARCGIS FOR THE ITEM 2019-02-14 11:36:28

AUTOMATIC UPDATES

HAVE BEEN PERFORMED Yes

LAST UPDATE 2019-02-14 11:35:39

[Hide Metadata Details ▲](#)

Metadata Contacts ►

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DESCRIPTION The website of the NSW Department of Planning & Environment, Division of Resources and Geoscience
FUNCTION PERFORMED information

[Hide Contact information ▲](#)

[Hide Metadata Contacts ▲](#)

Metadata Maintenance ►

MAINTENANCE

UPDATE FREQUENCY unknown

[Hide Metadata Maintenance ▲](#)

Thumbnail and Enclosures ►

THUMBNAIL

THUMBNAIL TYPE JPG

[Hide Thumbnail and Enclosures ▲](#)

FGDC Metadata (read-only) ▼