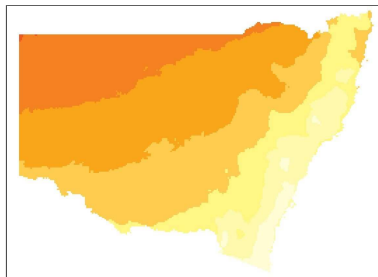


NSW Solar Exposure

File Geodatabase Raster Dataset



Tags

Solar exposure, solar energy, renewable energy, NSW

Summary

This raster dataset shows the average global solar exposure for New South Wales from 1990-2011. Global solar exposure indicates potential for development of solar energy resources. This dataset is presented here as a NSW statewide solar exposure map and was created as part of the NSW Renewable Energy Mapping Project undertaken by the Geological Survey of NSW.

Description

Global solar exposure is the total amount of solar energy falling on a horizontal surface. The daily global solar exposure is the total solar energy for a day. Typical values for daily global exposure range from 1 to 35 MJ/m² (megajoules per square metre). For mid-latitudes, the values are usually highest in clear sun conditions during the summer, and lowest during winter on very cloudy days.

These average data sets are based on 22 years (1990-2011) of solar exposure data processed by the Bureau of Meteorology derived from Japan Meteorological Agency and National Oceanographic & Atmospheric Administration satellite imagery.

Credits

Bureau of Meteorology
Japan Meteorological Agency
National Oceanographic & Atmospheric Administration (NOAA)

Use limitations

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

Extent

West 140.999263 **East** 153.638852
North -28.157002 **South** -37.549265

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 climatologyMeteorologyAtmosphere

* CONTENT TYPE Downloadable Data
EXPORT TO FGDC CSDGM XML FORMAT AS RESOURCE DESCRIPTION No

THEME KEYWORDS RENEWABLES-Solar

Hide Topics and Keywords ▲

Citation ►

TITLE NSW Solar Exposure
ALTERNATE TITLES Average global solar exposure
CREATION DATE 2015-12-03 00:00:00
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 image
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.

Please note the raw data has been sourced from the "Bureau of Meteorology"

We (the Department) are the Publishers, and the others (Bureau of Meteorology) are the Custodians.

[Hide Citation ▲](#)

Citation Contacts ►

RESPONSIBLE PARTY

ORGANIZATION'S NAME Bureau of Meteorology
CONTACT'S POSITION Climate Data Services
CONTACT'S ROLE custodian

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

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POSTAL CODE 2320
COUNTRY AU
E-MAIL ADDRESS geoscience.info@geoscience.nsw.gov.au

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

Bureau of Meteorology
Japan Meteorological Agency
National Oceanographic & Atmospheric Administration (NOAA)

ARCGIS ITEM PROPERTIES

* NAME NSW_Solar_Exposure
* 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 140.999263
* EAST LONGITUDE 153.638852
* NORTH LATITUDE -28.157002
* SOUTH LATITUDE -37.549265
* EXTENT CONTAINS THE RESOURCE Yes

EXTENT IN THE ITEM'S COORDINATE SYSTEM

* WEST LONGITUDE 140.999263
* EAST LONGITUDE 153.638852
* SOUTH LATITUDE -37.549265
* NORTH LATITUDE -28.157002
* EXTENT CONTAINS THE RESOURCE Yes

[Hide Extents ▲](#)

Resource Points of Contact ►

POINT OF CONTACT

ORGANIZATION'S NAME Bureau of Meteorology
CONTACT'S POSITION Climate Data Services
CONTACT'S ROLE custodian

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CONTACT'S ROLE publisher

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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>

LEGAL CONSTRAINTS

LIMITATIONS OF USE

THE FOLLOWING LIMITATION APPLIES TO THE RAW DATA SUPPLIED BY Bureau of Meteorology to NSW Department of Planning & Environment, Division of Resources and Geoscience:

Satellite-derived global solar exposure estimates are based on images from the Geostationary Meteorological Satellites GMS-4 and GMS-5, Geostationary Operational Environmental Satellite (GOES-9), and the MTSAT-1R and MTSAT-2 satellites, which are provided with permission of the Japan Meteorological Agency (JMA) and the United States National Oceanic & Atmospheric Administration (NOAA).

Any use of products from this imagery requires acknowledgement of the satellites of JMA and NOAA as the original source of the satellite data, and acknowledgement of the Commonwealth of Australia (Bureau of Meteorology) which received and processed the images.

Acknowledgement should be in the form: "Solar exposure data derived from satellite imagery processed by the Bureau of Meteorology from the Geostationary Meteorological Satellite and MTSAT series operated by Japan Meteorological Agency and from GOES-9 operated by the National Oceanographic & Atmospheric Administration (NOAA) for the Japan Meteorological Agency"

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 ►

GEORECTIFIED GRID ►

* NUMBER OF DIMENSIONS 2

AXIS DIMENSIONS PROPERTIES

DIMENSION TYPE column (x-axis)
* DIMENSION SIZE 253
* RESOLUTION 0.049959 Degree

AXIS DIMENSIONS PROPERTIES

DIMENSION TYPE row (y-axis)
* DIMENSION SIZE 188
* RESOLUTION 0.049959 Degree

* CELL GEOMETRY area
* POINT IN PIXEL center

* TRANSFORMATION PARAMETERS ARE AVAILABLE Yes

* CHECK POINTS ARE AVAILABLE No

CORNER POINTS

* POINT 140.999263 -37.549265
* POINT 140.999263 -28.157002
* POINT 153.638852 -28.157002
* POINT 153.638852 -37.549265

* CENTER POINT 147.319057 -32.853134

[Hide Georectified Grid ▲](#)

ARCGIS RASTER PROPERTIES ►

GENERAL INFORMATION

* PIXEL DEPTH 8
* COMPRESSION TYPE RLE
* NUMBER OF BANDS 1
* RASTER FORMAT GRID
* SOURCE TYPE continuous
* PIXEL TYPE unsigned integer
* NO DATA VALUE 0
* 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 - GRIDDED DATA POSITIONAL ACCURACY ►

CONFORMANCE TEST RESULTS

TEST PASSED Yes

RESULT EXPLANATION

The satellite data on which the analyses were based have an associated resolution and typical accuracy of 0.05 degrees (5 km) up to and including June 1994 and 0.01 degrees (1.25 km) thereafter, although some individual images have errors of several km.

[Hide Data quality report - Gridded data positional accuracy ▲](#)

DATA QUALITY REPORT - NON QUANTITATIVE ATTRIBUTE ACCURACY ►

CONFORMANCE TEST RESULTS

TEST PASSED Yes

RESULT EXPLANATION

The accuracy of the model's daily estimates of solar exposure is estimated by comparison with measurements by Bureau of Meteorology ground instruments.

The source of uncertainties associated with calculations includes:

- Anisotropy of cloud-top reflectance.
- Water vapour in the atmosphere.
- Satellite calibration.
- The availability of hourly images.

The model assumes that hourly (or less frequent) 'instantaneous samples' of the irradiance will describe the conditions for the hourly (or longer) period.

All these factors with both random and biased components means that the 95% uncertainty for any of the daily solar exposure estimates, regardless of the averaging period (that is, daily, monthly and seasonal), is of the order of 3 MJ/m².

[Hide Data quality report - Non quantitative attribute accuracy ▲](#)

DATA QUALITY REPORT - COMPLETENESS OMISSION ►

CONFORMANCE TEST RESULTS

TEST PASSED Yes

RESULT EXPLANATION

All of the months for the period had at least half of their days sampled, with the vast majority missing no more than one day. GOES-9 ceased operation in November 2005.

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

[Hide Data Quality ▲](#)

Lineage ►

LINEAGE STATEMENT

The Bureau of Meteorology's computer radiation model uses visible images from geostationary meteorological satellites to estimate daily global solar exposures at ground level.

At each location for each satellite acquired image, the brightnesses are averaged over each grid cell

and used to estimate solar irradiance at the ground. Essentially, the irradiance at the ground can be calculated from the irradiance at the top of the earth's atmosphere, the amount absorbed in the atmosphere (dependant on the amount of water vapour present), the amount reflected from the surface (surface albedo) and the amount reflected from clouds (cloud albedo).

These instantaneous irradiance values are integrated over the day to give daily insolation (daily radiant exposure) in megajoules per square metre. The daily exposure gridded datasets cover Australia with a resolution of 0.05 degrees in latitude and longitude.

The maps for this dataset were produced by reprocessing archived raw satellite data using software that was extensively rewritten in 2006 but based on the physical model that has been used since 1990. Bias with respect to exposure estimates from Bureau of Meteorology ground instruments was removed by a linear adjustment to each month's maps. The monthly averages have been adjusted (to reduce the effect of missing days as solar declination changes) using the ratio of top-of-atmosphere exposure totals for the full month and for the sampled days.

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 ▲](#)

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 ▲](#)

Fields ►

DETAILS FOR OBJECT VAT_NSW_Solar_Exposure ►

* TYPE Table
* ROW COUNT 8

FIELD OBJECTID ►

* ALIAS OBJECTID
* DATA TYPE OID
* WIDTH 4
* PRECISION 0

- * SCALE 0
- * FIELD DESCRIPTION
Internal feature number.
- * DESCRIPTION SOURCE
Esri
- * DESCRIPTION OF VALUES
Sequential unique whole numbers that are automatically generated.

[Hide Field OBJECTID ▲](#)

FIELD VALUE ►

- * ALIAS VALUE
- * DATA TYPE Integer
- * WIDTH 4
- * PRECISION 0
- * SCALE 0

[Hide Field VALUE ▲](#)

FIELD COUNT ►

- * ALIAS COUNT
- * DATA TYPE Integer
- * WIDTH 4
- * PRECISION 0
- * SCALE 0

[Hide Field COUNT ▲](#)

[Hide Details for object VAT_NSW_Solar_Exposure ▲](#)

[Hide Fields ▲](#)

References ►

PORTRAYAL CATALOGUE CITATION ►

TITLE NSW Solar Exposure
ALTERNATE TITLES Average global solar exposure
PUBLICATION DATE 2016-07-25 00:00:00
CREATION DATE 2015-12-03 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.

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[Hide Portrayal catalogue citation ▲](#)

[Hide References ▲](#)

Metadata Details ►

- * METADATA LANGUAGE English (AUSTRALIA)
- * METADATA CHARACTER SET utf8 - 8 bit UCS Transfer Format

METADATA IDENTIFIER 910BEA82-54A3-4995-BD77-55132742492B

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

METADATA STYLE ISO 19139 Metadata Implementation Specification

STANDARD OR PROFILE USED TO EDIT METADATA ISO19139

CREATED IN ARCGIS FOR THE ITEM 2016-06-07 13:07:55

LAST MODIFIED IN ARCGIS FOR THE ITEM 2019-02-14 11:38:52

AUTOMATIC UPDATES

HAVE BEEN PERFORMED Yes

LAST UPDATE 2019-02-14 11:37:24

ITEM LOCATION HISTORY

ITEM COPIED OR MOVED 2016-06-07 13:07:55

FROM

G:\Geosurvey\GeoInfo\GeoSpatial\Work_in_Progress\Mapping\State_NSW_Renewables\Data\Solar-Exposure_BOM_03_12_2015\solarexposure

TO \\maitlandfp1

\groups\$\Geosurvey\GeoInfo\GeoSpatial\Work_in_Progress\Mapping\State_NSW_Renewables\Final online data\Solar\solarexposure

[Hide Metadata Details ▲](#)

Metadata Contacts ►

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CONTACT'S POSITION Climate Data Services

CONTACT'S ROLE custodian

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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 Metadata Contacts ▲](#)

Metadata Maintenance ►

MAINTENANCE

UPDATE FREQUENCY unknown

[Hide Metadata Maintenance ▲](#)

Metadata Constraints ►

CONSTRAINTS

LIMITATIONS OF USE

Satellite-derived global solar exposure estimates are based on images from the Geostationary Meteorological Satellites GMS-4 and GMS-5, Geostationary Operational Environmental Satellite (GOES-9), and the MTSAT-1R and MTSAT-2 satellites, which are provided with permission of the Japan Meteorological Agency (JMA) and the United States National Oceanic & Atmospheric Administration (NOAA).

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[Hide Metadata Constraints ▲](#)

Thumbnail and Enclosures ►

THUMBNAIL

THUMBNAIL TYPE JPG

[Hide Thumbnail and Enclosures ▲](#)

FGDC Metadata (read-only) ▼