Concentrating Solar Direct Normal Potential

Tags

Direct Normal, Contiguous United States, Resource Potential, Solar Resource

Summary

Provides information on solar resource potential.

Description

Monthly and annual average direct normal irradiance for Hawaii and the contiguous United States

Credits

NREL

Use limitations

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Extent
    West -161.000000   **East**   -66.900000
    North   49.400000   **South** 18.000000

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

ArcGIS Metadata

Topics and Keywords

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

Citation

TITLE Concentrating Solar Direct Normal Potential

PRESENTATION FORMATS   ***** digital map

OTHER CITATION DETAILS
Perez, R., P. Ineichen, K. Moore, M.Kmiecik, C. Chain, R. George and F. Vignola (2002): A New Operational Satellite-to-Irradiance Model. Solar Energy

Resource Details

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

SPATIAL REPRESENTATION TYPE   ***** vector

SUPPLEMENTAL INFORMATION
This data provides monthly average and annual average daily total solar resource averaged over surface cells of 0.1 degrees in both latitude and longitude, or about 10 km in size. This data was developed using the State University of New York/Albany satellite radiation model. This model was developed by Dr. Richard Perez and collaborators at the National Renewable Energy Laboratory and other universities for the U.S. Department of Energy. Specific information about this model can be found in Perez, et al. (2002). This model uses hourly radiance images from geostationary weather satellites, daily snow cover data, and monthly averages of atmospheric water vapor, trace gases, and the amount of aerosols in the atmosphere to calculate the hourly total insolation (sun and sky) falling on a horizontal surface. Atmospheric water vapor, trace gases, and aerosols are derived from a variety of sources. A modified Bird model is used to calculate clear sky direct normal (DNI). This is then adjusted as a function of the ratio of clear sky global horizontal (GHI) and the model predicted GHI. Where possible, existing ground measurement stations are used to validate the data. Nevertheless, there is uncertainty associated with the meteorological input to the model, since some of the input parameters are not available at a 10km resolution. As a result, it is believed that the modeled values are accurate to approximately 15% of a true measured value within the grid cell. Due to terrain effects and other microclimate influences, the local cloud cover can vary significantly even within a single grid cell. Furthermore, the uncertainty of the modeled estimates increase with distance from reliable measurement sources and with the complexity of the terrain.

* PROCESSING ENVIRONMENT Microsoft Windows 7 Version 6.1 (Build 7601) Service Pack 1; Esri ArcGIS 10.3.0.4322

CREDITS
NREL

* Name energy_potential_solar_conc_v2

Extents

Extent
  Geographic extent
    Bounding rectangle
      Extent type   Extent used for searching
      * West longitude -161.000000
      * East longitude -66.900000
      * North latitude 49.400000
      * South latitude 18.000000
      * Extent contains the resource Yes

Extent in the item's coordinate system
  * West longitude -17922438.017717
  * East longitude -7447273.934070
  * South latitude 2037548.544751
  * North latitude 6343007.591429
  * Extent contains the resource Yes

Resource Constraints

Constraints
  Limitations of use
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Spatial Reference

ArcGIS coordinate system
  * Type Projected
  * Geographic coordinate reference GCS_WGS_1984
  * Projection WGS_1984_Web_Mercator_Auxiliary_Sphere
  * Coordinate reference details
    Projected coordinate system
      Well-known identifier 102100
      X origin -22041545.367140558

Y ORIGIN -33272760.666300893
XY SCALE 135368852.55357128
Z ORIGIN -100000
Z SCALE 10000
M ORIGIN -100000
M SCALE 10000
XY TOLERANCE 0.001
Z TOLERANCE 0.001
M TOLERANCE 0.001
HIGH PRECISION true
LATEST WELL-KNOWN IDENTIFIER 3857
WELL-KNOWN TEXT PROJCS["WGS_1984_Web_Mercator_Auxiliary_Sphere",GEOGCS
["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID
["WGS_1984",6378137.0,298.257223563]],PRIMEM["Greenwich",0.0],UNIT
["Degree",0.0174532925199433]],PROJECTION["Mercator_Auxiliary_Sphere"],PARAMETER
["False_Easting",0.0],PARAMETER["False_Northing",0.0],PARAMETER
["Central_Meridian",0.0],PARAMETER["Standard_Parallel_1",0.0],PARAMETER
["Auxiliary_Sphere_Type",0.0],UNIT["Meter",1.0],AUTHORITY["EPSG",3857]]

REFERENCE SYSTEM IDENTIFIER
* VALUE 3857
* CODESPACE EPSG
* VERSION 8.2.6

Spatial Data Properties

VECTOR
* LEVEL OF TOPOLOGY FOR THIS DATASET   geometry only

GEOMETRIC OBJECTS
FEATURE CLASS NAME energy_potential_solar_conc_v2
* OBJECT TYPE   composite
* OBJECT COUNT 91439

ARCGIS FEATURE CLASS PROPERTIES
FEATURE CLASS NAME energy_potential_solar_conc_v2
* FEATURE TYPE Simple
* GEOMETRY TYPE Polygon
* HAS TOPOLOGY FALSE
* FEATURE COUNT 91439
* SPATIAL INDEX TRUE
* LINEAR REFERENCING FALSE

Distribution

DISTRIBUTION FORMAT
* NAME File Geodatabase Feature Class

TRANSFER OPTIONS
* TRANSFER SIZE 11.860

Fields

DETAILS FOR OBJECT energy_potential_solar_conc_v2
* TYPE Feature Class
* ROW COUNT 91439

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.

FIELD Shape
* ALIAS Shape
* DATA TYPE Geometry
* WIDTH 0
* PRECISION 0
* SCALE 0
* FIELD DESCRIPTION
  Feature geometry.

* DESCRIPTION SOURCE
  Esri

* DESCRIPTION OF VALUES
  Coordinates defining the features.

FIELD ID
* ALIAS ID
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0

FIELD GRIDCODE
* ALIAS GRIDCODE
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0

FIELD ANN_DNI
* ALIAS ANN_DNI
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
  Annual average direct normal irradiance (kWh/m2/day)

DESCRIPTION SOURCE
  NREL

FIELD JAN
* ALIAS JAN
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0

FIELD FEB
* ALIAS FEB
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0

Field MAR
* Alias MAR
* Data type Double
* Width 8
* Precision 0
* Scale 0

Field APR
* Alias APR
* Data type Double
* Width 8
* Precision 0
* Scale 0

Field MAY
* Alias MAY
* Data type Double
* Width 8
* Precision 0
* Scale 0

Field JUN
* Alias JUN
* Data type Double
* Width 8
* Precision 0
* Scale 0

Field JUL
* Alias JUL
* Data type Double
* Width 8
* Precision 0
* Scale 0

Field AUG
* Alias AUG
* Data type Double
* Width 8
* Precision 0
* Scale 0

Field SEP
* Alias SEP
* Data type Double
* Width 8
* Precision 0
* Scale 0

Field OCT
* Alias OCT
* Data type Double
* Width 8
* Precision 0
* Scale 0

Field NOV
* Alias NOV
* Data type Double
* Width 8
* Precision 0
* Scale 0

Field DEC

* ALIAS DEC
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0

FIELD Shape_Length
* ALIAS Shape_Length
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
* FIELD DESCRIPTION
Length of feature in internal units.

* DESCRIPTION SOURCE
Esri

* DESCRIPTION OF VALUES
Positive real numbers that are automatically generated.

FIELD Shape_Area
* ALIAS Shape_Area
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
* FIELD DESCRIPTION
Area of feature in internal units squared.

* DESCRIPTION SOURCE
Esri

* DESCRIPTION OF VALUES
Positive real numbers that are automatically generated.

Metadata Details

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

SCOPE OF THE DATA DESCRIBED BY THE METADATA   * dataset
SCOPE NAME   * dataset

* LAST UPDATE 2016-08-29
ARCGIS METADATA PROPERTIES
Metadata format ArcGIS 1.0
Metadata style FGDC CSDGM Metadata
Standard or profile used to edit metadata FGDC

Created in ArcGIS for the item 2016-08-05 12:04:20
Last modified in ArcGIS for the item 2016-08-29 85:40:60

AUTOMATIC UPDATES
Have been performed Yes
Last update 2016-08-29 08:52:35