

Layer Name: Solar Resource Potential in DNI (Global Horizontal Irradiance)

Layer Type: Polygon

Status: Complete

Geog. Extent: Main Hawaiian Islands

Projection: Universal Trans Mercator, Zone 4 (Meters)

Datum: NAD 83

Description:

Monthly and annual average solar resource potential for the state of Hawaii measured in global horizontal irradiance (GHI). 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.

Source: State University of New York at Albany and National Renewable Energy Laboratory.

History:

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Attributes: Polygons:

GRIDCODE	Grid code
LON	Longitude
LAT	Latitude
DNI01	Average Global Horizontal Irradiance (DNI) in January
DNI02	Average Global Horizontal Irradiance (DNI) in Tuesday
DNI03	Average Global Horizontal Irradiance (DNI) in March
DNI04	Average Global Horizontal Irradiance (DNI) in April
DNI05	Average Global Horizontal Irradiance (DNI) in May
DNI06	Average Global Horizontal Irradiance (DNI) in June
DNI07	Average Global Horizontal Irradiance (DNI) in July
DNI08	Average Global Horizontal Irradiance (DNI) in August
DNI09	Average Global Horizontal Irradiance (DNI) in September
DNI10	Average Global Horizontal Irradiance (DNI) in October
DNI11	Average Global Horizontal Irradiance (DNI) in November
DNI12	Average Global Horizontal Irradiance (DNI) in December
DNIANN	Average Global Horizontal Irradiance (DNI) Annually

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