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

Layer Type: Polygon

Status: Complete

Geog. Extent: Main Hawaiian Islands

Projection: Universal Transverse Mercator, Zone 4 (Meters)

Datum: NAD 83 HARN

Please note - if you are using data in the <u>State's web services</u> or downloading from the <u>State's geoportal</u>, the data is served and exported in WGS84 coordinates, although it is stored internally in UTM coordinates.

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:

This GIS data was developed by the National Renewable Energy Laboratory ("NREL"), which is operated by the Midwest Research Institute for the U.S. Department of Energy ("DOE"). The user is granted the right, without any fee or cost, to use, copy, modify, alter, enhance and distribute this data for any purpose whatsoever, provided that this entire notice appears in all copies of the data. Further, the user of this data agrees to credit NREL in any publications or software that incorporate or use the data. Access to and use of the GIS data shall further impose the following obligations on the User. The names DOE/NREL may not be used in any advertising or publicity to endorse or promote any product or commercial entity using or incorporating the GIS data unless specific written authorization is obtained from DOE/NREL. The User also understands that DOE/NREL shall not be obligated to provide updates, support, consulting, training or assistance of any kind whatsoever with regard to the use of the GIS data. THE GIS DATA IS PROVIDED "AS IS"

AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL DOE/NREL BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO CLAIMS ASSOCIATED WITH THE LOSS OF DATA OR PROFITS, WHICH MAY RESULT FROM AN ACTION IN CONTRACT, NEGLIGENCE OR OTHER TORTIOUS CLAIM THAT ARISES OUT OF OR IN CONNECTION WITH THE ACCESS OR USE OF THE GIS DATA. The User acknowledges that access to the GIS data is subject to U.S. Export laws and regulations and any use or transfer of the GIS data must be authorized under those regulations. The User shall not use, distribute, transfer, or transmit GIS data or any products incorporating the GIS data except in compliance with U.S. export regulations. If requested by DOE/NREL, the User agrees to sign written assurances and other export-related documentation as may be required to comply with U.S. export regulations.

Attributes: Polygons:

GHI Units:	watt hours per square meter per day (Wh/m2/day)
GRIDCODE	Grid code
LON	Longitude
LAT	Latitude
GHI 01	Average Global Horizontal Irradiance (GHI) in January
GHI 02	Average Global Horizontal Irradiance (GHI) in February
GHI 03	Average Global Horizontal Irradiance (GHI) in March
GHI 04	Average Global Horizontal Irradiance (GHI) in April
GHI 05	Average Global Horizontal Irradiance (GHI) in May
GHI 06	Average Global Horizontal Irradiance (GHI) in June
GHI 07	Average Global Horizontal Irradiance (GHI) in July
GHI 08	Average Global Horizontal Irradiance (GHI) in August
GHI 09	Average Global Horizontal Irradiance (GHI) in September
GHI 10	Average Global Horizontal Irradiance (GHI) in October
GHI 11	Average Global Horizontal Irradiance (GHI) in November
GHI 12	Average Global Horizontal Irradiance (GHI) in December
GHI ANN	Average Global Horizontal Irradiance (GHI) Annually

Contact: Hawaii Statewide GIS Program, Office of Planning, State of Hawaii

PO Box 2359, Honolulu, Hi. 96804; (808) 587-2846.

email: gis@hawaii.gov