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Data Article

Annually and monthly resolved solar irradiance and atmospheric temperature data across the Hawaiian archipelago from 1998 to 2015 with interannual summary statistics

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ABSTRACT

This article contains data and summary statistics of solar irradiance and dry bulb temperature across the Hawaiian archipelago resolved on a monthly basis and spanning years 1998–2015. This data was derived in association with an article titled “Consequences of Neglecting the Interannual Variability of the Solar Resource: A Case Study of Photovoltaic Power Among the Hawaiian Islands” (Bryce et al., 2018 [7]). The solar irradiance data is presented in terms of Direct Normal Irradiance (DNI), Diffuse Horizontal Irradiance (DHI), and Global Horizontal Irradiance (GHI) and was obtained from the satellite-derived data contained in the National Solar Radiation Database (NSRDB). The temperature data is also obtained from this source. We have processed the NSRDB data and compiled these monthly resolved data sets, along with interannual summary statistics including the interannual coefficient of variability.

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Specifications Table

Subject area	<i>Solar Energy Engineering</i>
More specific subject area	<i>Variability of Solar Irradiance and Atmospheric temperature</i>
Type of data	<i>Graphical, Tabulated</i>
How data was acquired	<i>Processed data from the National Solar Radiation Database</i>
Data format	<i>Analyzed</i>
Experimental factors	
Experimental features	
Data source location	<i>Hawaiian Archipelago</i>
Data accessibility	<i>Analyzed data contained herein, source data available publicly from the National Solar Radiation Database, which can be accessed at https://maps.nrel.gov/nsrdb-viewer/</i>
Related research article	<i>Bryce, R., Losada, I., Hodge, B., Martinez-anido, C.B., 2018. Consequences of Neglecting the Interannual Variability of the Solar Resource: A Case Study of Photovoltaic Power Among the Hawaiian Islands. Sol. Energy in press.</i>

Value of the data

- High penetration levels of solar renewable energy is enabled by accurate knowledge of the quantity and variability of the solar resource at a given location.
- Given objectives laid out by the Hawaiian Clean Energy Initiative which commits the state to generating 100% of the electrical energy consumed across the state by renewable energy sources by the year 2045 [1], knowledge of variability of the solar resource and temperature is essential for project planning and for stakeholders alike.
- Data contained herein allows for comparison of ground-based measurements of solar irradiance and temperature on the Hawaiian Islands against these satellite-derived values.
- Data contained herein allows for comparison between solar irradiance and dry-bulb temperature across Hawaii with other Pacific island chains.

1. Data

The U.S. Department of Energy has funded the multiyear production of the National Solar Radiation Database (NSRDB). This database has been updated three times since the initial public release in 1992. The most recent version contains a wide range of solar irradiance data derived from satellite data and meteorological data derived from reanalysis data. This data is presented with a 4-km by 4-km spatial resolution and half-hourly temporal resolution covering the 18 years from 1998 to 2015 [2]. The reanalysis data is obtained from NASA's Modern-Era Retrospective Analysis for Research and Applications (MERRA) data set [3]. This version of the NSRDB includes data from the area bounded by the 25°W and 175°W meridians and by the – 20°S and 60°N parallels.

The performance of the irradiance data sets in the most recent version of the NSRDB was evaluated in [2]; the hourly average satellite-derived data have a mean bias error of $\pm 5\%$ for GHI and less than $\pm 10\%$ for DNI when compared against concurrent ground-based measurements from seven sites of the Surface Radiation Budget Network. The NSRDB has been shown to accurately feature interannual variability; the coefficient of variation (COV) for both the satellite-derived data sets and ground-measured from seven Surface Radiation Budget Network stations across the United States

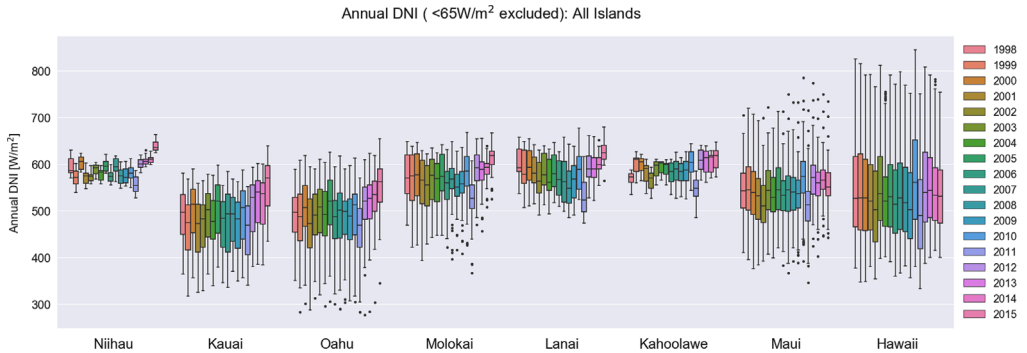


Fig. 1. Box-plots of annual mean direct normal irradiance among all NSRDB grid cells sites for the years 1998–2015, repeated for each island of the Hawaiian archipelago. Outliers beyond 150% of the interquartile range are shown as dots.

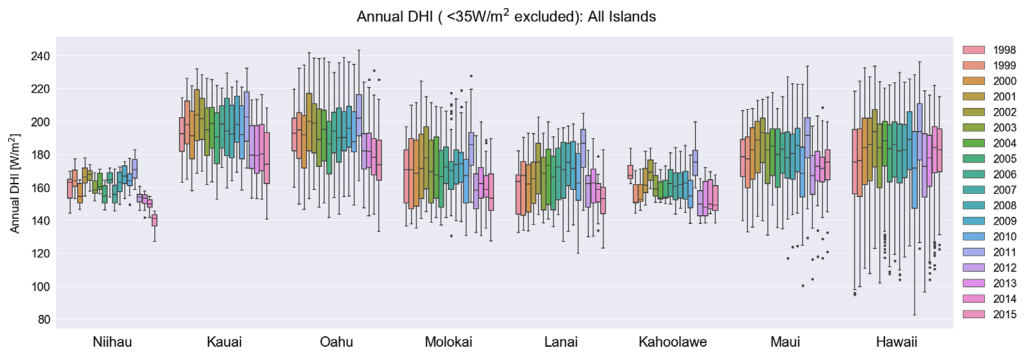


Fig. 2. Box-plots of annual mean diffuse horizontal irradiance among all NSRDB grid cells sites for the years 1998–2015, repeated for each island of the Hawaiian archipelago. Outliers beyond 150% of the interquartile range are shown as dots.

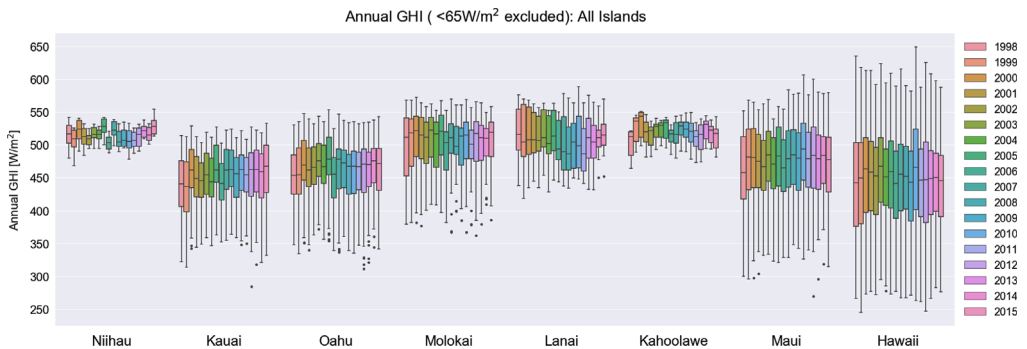


Fig. 3. Box-plots of annual mean global normal irradiance among all NSRDB grid cells sites for the years 1998–2015, repeated for each island of the Hawaiian archipelago. Outliers beyond 150% of the interquartile range are shown as dots.

where compared. The data sets show similar annual trends and differ by only 0.68% COV for global horizontal irradiance (GHI) and 0.97% COV for direct normal irradiance (DNI).

In the original public release, [3] reported the root mean squared residuals between the MERRA data sets and measured data. The MERRA data sets have also been independently evaluated in [4–6]; the data sets feature a mean bias of dry-bulb temperature of less than 1 °C globally.

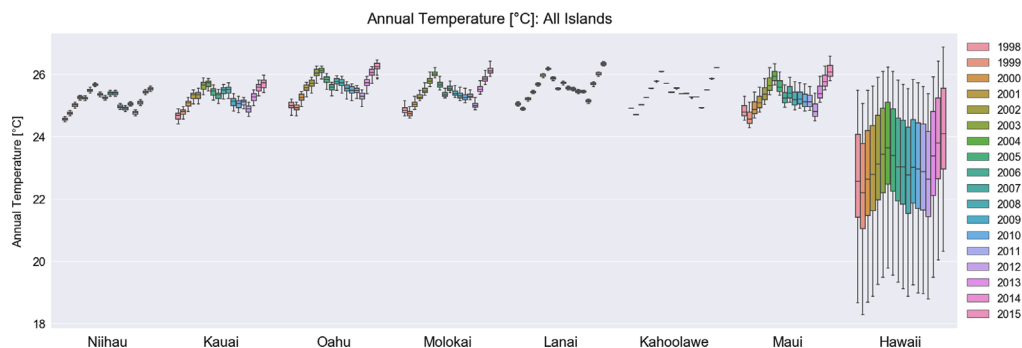


Fig. 4. Box-plots of annual mean dry-bulb temperature ($^{\circ}\text{C}$) among all NSRDB grid cells sites for the years 1998–2015, repeated for each island of the Hawaiian archipelago. Outliers beyond 150% of the interquartile range are shown as dots.

Herein, we share the monthly averaged solar irradiance and dry-bulb temperature data across all eight major islands of the Hawaiian Archipelago for all years from 1998 to 2015. We report box-plots of values from all the NSRDB grid cells, as well as tabulated island-wide mean, for each island. Along with the tabulated data, we report interannual summary statistics to quantify the interannual variability of solar irradiance, reported as GHI, and temperature for each island. This data and the summary statistics were compiled alongside another work which aimed to characterize the interannual variability of the solar irradiance and meteorological conditions across the State of Hawaii and to then characterize the variability of PV power generation [7].

2. Experimental design, materials, and methods

In compiling the data tables of GHI and atmospheric temperature, we sample 1-h resolution DNI, DHI, GHI, and temperature data among the Hawaiian Islands for the 18 years available in the NSRDB (1998–2015). Therefore, the basis data set we analyzed contained 8760 hourly values for the various grid cells over land of each island of Hawaii; 10 cells across Ni‘ihau, 81 cells across Kauai, 82 cells across O‘ahu, 35 cells across Moloka‘i, 18 grid cells across Lanai, 7 cells across Kaho‘olawe, 102 cells across Maui, and 559 cells across Hawai‘i.

Solar irradiance values are often reported in a way that excludes values below a certain threshold of the clear-sky radiation [8]. This filter excludes the shading effect that is pronounced during dawn and dusk. To identify the appropriate threshold, we calculated the first nonzero irradiance value during each day for each site across the State of Hawaii; the mean value for GHI and DNI was 65 W/m^2 , whereas a lower value of 35 W/m^2 for DHI was identified. No filter is applied to the temperature data. For all NSRDB cells across each island, the annual mean value was calculated. Then, a box plot of the annual mean value of all NSRDB cells was produced for each year of data (Figs. 1–4). The data that was used to generate these box plots, including the minimum values, the values of the first quartiles, the values of the second quartiles, the values of the third quartiles, and the maximum annual mean values are tabulated in Tables 1–4.

The grand mean values of GHI and temperature were calculated among all NSRDB cells on both a monthly and annual basis. Additionally, the monthly grand means were compared on an interannual basis. The 1st, and 3rd quartiles of the 18 years of monthly grand means were calculated. On the same interannual basis, the mean, the standard deviation, the maximum, the minimum, and range of monthly grand means were calculated. Finally, the interannual coefficient of variation (COV), which is the standard deviation divided by the mean and expressed as a percentage, was calculated (see Tables 5–20).

Table 1

The minimum values, the quartile values, and the maximum annual mean values for DNI across each island during each year from 1998 to 2015.

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Niihau	Min	569.9	539.2	582.6	547.0	557.7	568.4	557.1	580.6	555.1	561.6	548.2	553.4	549.5	527.7	581.7	594.2	598.3	624.2
	Q1	576.5	554.0	588.0	556.1	562.5	576.1	562.7	583.3	561.0	579.5	553.8	558.0	565.1	539.7	589.1	597.5	600.6	628.8
	Q2	583.5	563.3	595.2	566.6	569.7	586.1	576.6	589.3	570.5	587.7	568.6	564.4	578.2	542.9	595.6	602.8	607.2	632.5
	Q3	609.9	579.4	612.0	579.3	576.3	595.1	585.4	603.2	578.8	605.8	579.4	588.9	585.8	568.5	606.1	607.2	613.4	642.8
	Max	629.8	601.6	623.1	602.8	596.7	603.9	596.1	620.4	598.3	617.6	604.7	606.0	611.1	586.7	619.7	629.7	627.3	662.6
Kauai	Min	365.2	317.4	356.8	325.4	328.6	364.2	339.9	379.5	346.8	335.7	370.1	349.3	357.0	340.9	380.3	385.7	384.0	434.8
	Q1	449.3	408.5	445.4	410.3	420.0	441.1	437.9	450.7	421.7	410.5	433.4	414.2	435.6	404.8	454.4	473.3	470.7	504.2
	Q2	495.0	473.7	513.6	470.9	482.1	494.6	475.9	518.1	481.1	492.1	489.5	482.3	504.9	463.3	526.3	535.2	534.0	568.1
	Q3	534.6	511.1	545.0	513.4	512.7	535.4	520.8	552.7	519.0	535.3	528.2	517.5	542.3	509.8	553.7	563.6	559.3	595.6
	Max	580.3	568.4	589.9	558.9	564.0	578.0	575.4	597.8	553.5	583.3	568.0	562.2	586.9	551.2	593.5	600.9	599.6	639.4
Oahu	Min	351.1	283.8	301.4	288.1	313.0	319.7	296.1	305.8	300.4	289.6	304.0	307.1	305.4	282.8	277.4	284.8	303.4	345.3
	Q1	452.6	434.4	462.7	417.7	448.2	452.3	444.7	468.9	440.0	439.2	448.2	433.0	446.9	421.1	481.2	482.7	497.2	516.6
	Q2	496.4	484.7	505.4	471.9	488.8	505.5	489.2	516.0	486.0	496.5	497.4	487.8	512.9	467.4	519.8	523.9	533.9	559.8
	Q3	523.7	531.7	552.9	518.3	533.4	545.6	538.7	561.8	521.8	537.9	520.7	518.9	531.0	503.5	549.9	552.0	561.9	589.1
	Max	588.9	608.1	618.2	594.5	589.1	610.5	603.5	625.3	593.8	617.4	589.2	596.1	612.4	570.0	609.1	622.7	618.8	654.1
Molokai	Min	469.2	421.9	427.0	393.8	429.2	443.2	447.3	447.8	422.2	396.3	416.0	408.0	426.8	367.0	470.0	456.5	507.7	524.8
	Q1	530.5	517.5	529.2	512.6	508.4	521.3	508.9	538.7	513.7	533.9	528.7	529.4	548.6	497.0	557.1	560.0	575.7	593.9
	Q2	566.2	563.4	576.2	554.2	551.4	564.0	567.8	566.1	553.7	566.4	548.7	556.7	584.4	526.1	591.2	588.1	592.9	615.9
	Q3	617.6	619.0	620.9	606.2	593.9	606.5	597.8	618.6	582.3	585.4	573.7	579.8	613.4	545.6	617.9	603.2	599.9	624.6
	Max	648.2	637.3	645.6	628.8	622.2	634.3	623.8	640.8	630.3	648.2	627.3	635.1	667.7	606.4	653.5	654.7	639.5	666.3
Lanai	Min	537.0	507.5	509.9	515.1	490.5	512.4	493.6	517.1	509.5	499.3	485.5	491.4	523.8	473.5	528.1	522.1	554.5	564.2
	Q1	573.0	554.1	564.6	553.7	530.7	554.1	538.0	546.2	527.3	516.0	508.9	527.3	541.7	494.9	571.9	569.8	587.7	606.4
	Q2	590.3	575.7	581.5	574.6	558.4	575.2	557.3	576.1	553.4	538.9	531.3	556.5	572.5	503.2	587.9	584.9	595.4	620.0
	Q3	631.1	629.2	622.8	612.2	602.8	620.4	608.7	619.3	598.6	594.0	582.9	586.2	615.3	557.8	616.1	601.4	610.2	638.6
	Max	656.8	648.4	654.4	641.7	630.1	638.7	631.8	645.5	626.2	657.1	641.8	638.1	677.1	616.3	660.7	658.5	651.0	679.0
Kahoolawe	Min	534.8	559.6	564.0	536.7	526.0	554.9	566.0	555.0	534.4	526.2	529.9	525.5	543.4	484.8	564.9	560.4	570.6	572.7
	Q1	551.5	561.5	567.3	546.3	535.4	561.5	567.7	557.6	554.8	550.8	555.2	552.4	569.3	517.8	571.5	573.8	579.2	585.3
	Q2	565.3	606.6	604.4	577.8	558.6	586.4	594.3	598.5	563.7	571.5	565.3	567.6	588.5	532.2	602.4	587.2	582.8	594.3
	Q3	576.1	611.2	609.0	592.2	577.5	602.4	603.2	600.6	596.2	589.7	589.4	596.5	611.1	553.3	619.2	619.9	615.3	623.5
	Max	586.9	626.3	621.1	610.6	593.4	610.0	604.8	608.6	610.3	625.4	614.0	626.1	643.3	585.0	640.0	638.8	628.6	646.7
Maui	Min	410.9	395.5	376.7	384.0	392.3	407.7	399.0	421.0	383.5	366.5	391.8	388.4	392.2	346.9	424.6	402.1	446.5	442.5
	Q1	504.7	499.0	491.5	479.1	474.4	500.3	497.3	501.9	498.1	498.3	500.5	501.8	536.2	476.0	531.8	531.4	545.9	531.6
	Q2	540.6	543.7	536.4	531.0	509.7	541.7	526.7	543.5	530.4	543.5	538.8	536.0	572.9	511.6	570.2	557.2	565.0	550.2
	Q3	580.2	593.7	584.0	568.1	552.3	585.2	570.9	592.0	563.3	571.8	571.1	563.8	604.1	540.0	597.1	581.5	586.1	580.9
	Max	704.5	718.8	707.2	692.7	698.7	721.6	677.2	712.5	712.4	749.6	731.7	731.7	784.9	715.1	773.2	739.2	748.6	734.7
Hawaii	Min	377.4	347.9	348.7	380.5	354.8	398.4	401.9	391.1	360.6	367.1	381.7	356.2	381.1	333.4	387.8	400.1	414.6	399.9
	Q1	465.1	457.3	457.7	458.5	433.6	479.2	466.7	465.8	451.4	459.5	455.7	440.4	481.3	418.8	475.9	484.5	479.5	473.9
	Q2	526.6	527.2	526.4	520.8	501.4	536.0	519.9	529.8	513.4	526.8	517.7	501.6	560.6	489.3	539.3	543.2	532.6	528.2
	Q3	615.4	621.4	609.5	598.3	583.7	615.5	572.2	598.0	587.1	601.9	592.6	581.8	651.5	566.3	624.3	614.1	592.1	587.6
	Max	824.8	814.0	790.3	791.2	764.6	811.1	754.7	790.4	771.4	797.0	768.6	750.9	844.4	750.6	807.8	790.5	780.6	754.0

Table 2

The minimum values, the quartile values, and the maximum annual mean values for DHI across each island during each year from 1998 to 2015.

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Niihau	Min	144.4	152.9	146.6	154.5	157.6	151.7	155.9	146.1	153.9	145.4	149.4	153.0	149.6	158.5	145.8	141.7	141.5	126.8
	Q1	151.9	158.9	149.3	160.7	162.7	155.4	157.7	148.2	161.3	149.2	154.7	160.6	157.6	164.8	149.6	147.8	145.1	135.3
	Q2	157.8	161.1	151.4	163.1	165.9	157.0	159.8	152.4	163.3	152.8	160.6	164.0	163.1	166.8	152.6	152.2	148.4	138.8
	Q3	164.7	169.6	161.3	170.7	168.5	162.9	166.3	160.0	167.5	159.0	164.1	169.0	164.5	173.6	155.5	154.3	150.6	143.0
Kauai	Max	169.6	177.0	164.3	177.9	173.6	168.6	170.8	164.2	171.5	170.9	172.3	175.6	177.6	182.6	160.7	157.4	154.4	145.6
	Min	162.7	164.8	157.8	168.3	169.6	161.6	163.3	152.7	172.0	159.7	163.9	168.9	158.3	171.6	153.2	152.9	152.8	140.5
	Q1	181.4	186.1	177.0	187.7	188.1	177.3	183.5	173.5	183.3	178.9	177.4	186.3	177.1	187.6	170.4	168.2	169.5	160.6
	Q2	191.3	197.8	189.5	203.7	200.6	194.5	198.5	188.3	196.5	192.8	192.0	197.8	191.4	201.9	178.3	178.5	179.7	173.8
Oahu	Q3	200.6	211.4	205.7	218.8	213.9	207.3	208.1	205.0	209.0	212.9	209.5	215.1	209.1	217.1	195.6	197.0	197.8	192.2
	Max	214.3	226.0	221.3	231.8	228.3	226.1	225.5	221.9	220.0	229.2	220.8	224.3	220.9	232.1	213.1	213.2	216.3	208.1
	Min	159.8	149.9	146.4	152.9	158.5	147.9	150.3	141.7	153.5	143.5	154.4	154.7	149.2	163.8	147.6	142.6	143.7	133.2
	Q1	181.5	177.3	171.1	181.6	180.2	171.7	174.7	166.6	180.0	174.2	180.6	183.8	179.7	190.6	170.2	171.6	167.2	163.0
Molokai	Q2	192.1	194.7	191.4	199.9	198.2	188.8	193.7	185.4	192.8	188.4	189.7	195.5	187.2	201.2	181.4	181.4	178.0	172.7
	Q3	201.7	205.0	202.7	215.6	210.4	206.2	205.9	199.6	205.4	207.2	205.1	208.5	205.4	216.4	192.1	192.6	189.2	187.8
	Max	219.5	232.1	234.1	241.8	238.3	238.2	238.5	236.2	229.6	235.4	238.7	236.1	234.6	243.3	223.6	225.4	230.8	225.2
	Min	136.5	137.6	135.1	140.9	145.2	138.5	141.8	137.1	141.4	130.7	139.7	139.1	130.5	150.8	132.3	130.6	134.9	127.2
Lanai	Q1	149.2	146.5	147.7	152.5	158.5	149.3	152.5	146.9	162.0	154.7	159.1	161.3	148.1	169.1	146.1	151.9	152.4	145.3
	Q2	169.0	166.4	168.0	168.0	177.2	165.7	166.2	164.9	169.6	168.0	173.3	174.0	162.3	185.7	156.5	161.7	157.9	152.1
	Q3	182.1	186.9	187.0	190.0	195.1	186.5	187.8	180.5	181.6	175.5	182.5	180.8	174.5	192.3	167.7	170.5	166.2	165.7
	Max	196.6	209.7	211.5	224.3	215.1	211.4	209.2	208.4	206.0	217.1	213.7	218.7	211.8	227.5	191.1	199.5	188.6	189.5
Kahoolawe	Min	132.4	133.8	133.6	137.5	143.3	138.3	140.5	136.0	143.4	127.0	133.2	137.1	119.7	145.7	129.8	130.1	133.8	123.1
	Q1	143.5	141.8	143.8	148.1	155.4	144.8	148.5	145.3	150.6	150.8	160.2	156.1	149.0	170.2	147.3	148.8	149.8	143.3
	Q2	159.5	161.9	160.3	163.5	174.8	167.0	170.6	165.4	167.6	162.8	167.1	166.5	155.2	178.4	159.6	161.8	157.0	152.7
	Q3	166.5	173.4	173.2	173.5	186.2	176.2	178.8	176.0	179.5	185.6	186.3	186.4	176.3	194.9	166.5	168.5	162.0	159.2
Hawaii	Max	182.1	190.2	192.9	192.4	202.4	192.6	199.5	190.6	195.5	196.1	197.1	198.3	186.3	204.9	182.3	189.5	178.9	182.7
	Min	162.3	144.1	145.8	149.0	159.3	150.8	150.9	150.2	149.8	143.7	147.1	144.7	138.1	159.6	138.0	138.2	143.8	138.2
	Q1	164.2	148.6	149.5	153.7	162.3	153.2	152.1	152.5	153.1	145.9	149.3	149.0	140.5	161.8	139.6	140.1	145.2	142.9
	Q2	165.1	150.5	152.2	158.0	164.6	155.3	152.9	153.7	154.5	158.2	156.6	154.7	154.0	171.8	145.0	144.7	148.2	147.5
Mauai	Q3	171.6	152.7	153.1	164.8	171.7	161.2	155.2	155.1	167.4	164.7	166.6	167.1	160.6	180.4	152.5	157.8	160.1	156.7
	Max	183.6	170.0	170.8	181.8	183.7	174.5	170.7	173.0	180.8	183.8	181.8	185.4	179.5	199.6	165.0	172.0	169.2	167.3
	Min	139.5	132.8	135.7	142.3	139.7	130.8	149.0	135.3	134.7	117.0	123.6	124.4	100.2	129.1	104.0	117.9	116.8	120.7
	Q1	165.7	159.3	163.9	168.5	174.5	161.9	166.7	159.5	167.5	165.1	164.4	169.3	153.7	177.5	155.4	163.5	163.0	163.9
Hawaii	Q2	177.9	176.8	182.3	188.4	192.2	182.1	184.1	179.6	182.9	177.5	179.3	184.1	167.5	190.9	166.9	172.0	170.9	175.0
	Q3	188.4	190.1	196.0	199.2	201.5	192.6	195.2	193.7	192.0	193.3	191.8	195.3	183.8	201.4	178.8	181.3	177.6	182.4
	Max	206.4	207.2	207.9	212.6	213.4	214.5	217.4	207.9	214.8	227.1	222.6	222.5	222.3	233.5	197.0	203.2	208.3	199.7
	Min	94.6	99.6	110.7	107.3	122.8	101.7	117.1	107.3	115.3	103.8	117.4	124.4	82.3	122.8	96.2	103.7	110.4	122.3
Hawaii	Q1	155.8	154.3	161.5	163.7	172.2	159.4	172.8	163.0	166.1	162.5	165.7	170.5	147.1	176.2	153.8	160.5	168.5	169.2
	Q2	175.2	176.1	183.8	185.7	193.6	183.8	188.1	183.3	185.9	181.8	182.7	188.6	171.4	193.7	172.3	177.8	183.5	182.8
	Q3	194.9	195.4	201.7	201.8	207.0	198.2	200.0	197.9	199.4	198.1	197.9	205.7	193.6	210.3	192.5	191.3	196.3	195.4
	Max	218.1	224.5	232.5	227.0	233.6	224.1	220.1	222.1	223.4	229.5	223.7	225.7	228.4	236.2	218.6	216.0	221.9	214.8

Table 3

The minimum values, the quartile values, and the maximum annual mean values for GHI across each island Hawaii during each year from 1998 to 2015.

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Niihau	Min	479.5	468.1	490.6	483.8	494.3	494.3	494.8	499.9	487.8	498.9	489.7	494.9	478.3	487.0	490.0	509.5	501.0	513.0
	Q1	494.2	487.8	504.2	493.1	497.3	503.2	502.7	514.4	491.8	510.2	495.1	496.6	493.4	495.6	492.1	510.1	504.6	514.5
	Q2	508.7	500.2	513.5	504.1	503.7	511.3	510.4	520.8	499.8	517.0	499.8	499.8	498.1	500.2	510.8	516.3	511.9	522.3
	Q3	527.5	521.8	535.4	524.9	513.1	520.6	521.0	536.8	507.0	529.2	514.2	522.1	517.0	518.5	524.2	528.1	523.0	535.1
	Max	541.7	525.7	540.6	531.9	524.9	530.8	527.7	541.8	520.6	538.5	532.4	534.3	532.8	525.9	531.4	537.8	532.2	554.5
Kauai	Min	322.0	313.9	342.7	344.1	348.9	359.0	346.8	362.7	352.5	354.6	364.1	358.8	348.7	350.3	284.3	318.2	321.4	332.3
	Q1	402.6	397.8	434.4	419.0	419.3	424.6	417.9	438.5	413.1	431.2	436.1	417.4	424.2	428.0	418.7	427.6	418.2	423.7
	Q2	439.8	436.3	460.5	448.0	445.0	454.2	443.7	461.4	441.1	461.5	458.2	455.5	462.1	453.8	461.7	462.8	456.3	467.2
	Q3	473.8	470.4	490.4	481.2	472.1	485.4	478.9	499.0	469.4	491.7	490.1	479.5	484.1	479.7	487.4	492.0	486.7	497.6
	Max	514.3	512.6	528.5	512.3	503.6	518.9	511.4	526.9	502.3	522.6	524.2	511.2	521.7	508.5	527.1	522.5	518.3	533.2
Oahu	Min	348.4	334.7	350.7	340.4	363.0	372.1	356.7	354.1	339.2	336.5	360.6	339.4	334.9	347.5	311.6	321.5	343.9	341.6
	Q1	423.0	423.4	441.3	433.5	437.7	449.9	438.9	452.4	418.9	431.4	433.3	423.9	425.0	430.0	426.8	434.8	441.0	430.2
	Q2	449.8	453.6	469.0	460.7	463.8	471.6	465.4	477.0	454.5	474.0	470.4	466.9	467.3	466.6	469.4	469.7	474.7	470.8
	Q3	484.5	489.0	503.4	494.9	495.3	501.6	497.9	510.6	480.5	491.3	490.7	485.6	489.3	488.6	493.3	488.9	492.6	493.7
	Max	530.8	535.6	547.6	539.5	532.4	543.5	535.0	553.1	524.6	546.4	536.9	533.8	535.6	531.7	533.7	534.8	537.5	542.5
Molokai	Min	379.0	382.2	381.8	377.1	400.9	409.6	408.5	397.1	382.1	366.9	399.3	385.0	366.9	378.7	361.8	379.1	409.5	386.1
	Q1	446.1	459.2	472.4	468.5	464.6	474.3	460.6	476.8	460.1	483.5	483.0	465.6	473.8	476.1	468.3	468.9	478.1	474.7
	Q2	509.4	517.7	511.3	513.0	507.5	515.7	514.9	519.6	503.5	509.0	497.2	513.3	512.1	499.3	517.5	509.2	507.8	513.7
	Q3	539.6	537.8	543.1	540.9	533.0	539.3	533.5	544.6	518.8	528.3	524.0	523.3	533.3	520.3	529.8	524.3	524.4	533.6
	Max	568.4	568.1	571.8	564.0	558.3	561.9	552.4	567.0	552.5	569.4	560.9	560.7	568.9	556.4	565.3	564.0	549.3	557.8
Lanai	Min	438.2	418.5	435.2	444.8	434.8	453.7	428.3	446.0	443.5	437.0	433.7	449.2	447.6	441.7	432.1	431.7	450.2	452.0
	Q1	490.4	478.0	480.7	482.8	481.9	489.7	476.8	483.0	472.6	459.9	457.2	463.7	464.6	459.6	478.4	471.8	492.6	494.7
	Q2	509.5	499.0	507.2	505.7	504.9	508.6	498.6	511.2	485.6	467.8	471.3	494.4	480.3	469.7	507.0	499.6	508.5	513.7
	Q3	554.0	555.3	552.9	544.1	543.2	548.1	542.6	549.4	521.1	528.4	522.4	516.0	536.7	519.9	538.4	520.3	516.8	525.3
	Max	575.7	569.7	568.3	562.0	556.1	563.4	552.8	563.0	550.1	577.8	571.0	564.0	588.1	563.8	575.2	564.8	558.8	569.9
Kahoolawe	Min	464.0	489.0	498.2	481.3	482.2	492.9	498.9	495.2	485.1	479.5	490.4	489.4	478.0	473.5	474.2	494.8	493.7	481.4
	Q1	473.6	489.8	498.4	487.3	484.8	496.6	499.7	495.7	492.9	488.6	502.6	501.1	487.0	485.2	477.1	497.2	498.2	485.6
	Q2	490.2	520.6	525.6	519.7	513.0	524.8	523.2	524.2	513.0	513.9	523.4	518.7	518.6	507.2	507.7	519.8	507.5	503.7
	Q3	517.3	539.3	547.3	528.3	523.6	527.7	532.7	536.3	518.1	524.7	530.8	527.9	524.3	514.8	522.8	531.3	524.1	518.7
	Max	521.4	545.5	550.9	546.0	536.2	539.9	537.0	541.7	530.5	543.3	544.9	548.3	549.6	534.0	539.0	544.1	537.9	542.7
Maui	Min	300.1	295.8	297.4	304.3	331.7	333.9	323.3	321.4	328.5	328.9	348.5	342.8	326.2	339.9	269.8	295.9	318.8	315.1
	Q1	416.7	430.8	434.8	432.5	428.8	443.7	432.6	433.1	426.8	433.7	437.7	429.9	443.3	434.0	430.6	431.2	440.1	425.1
	Q2	455.6	479.5	477.9	472.7	466.8	483.6	467.5	479.2	464.5	478.9	482.9	477.9	491.1	478.9	481.7	478.0	483.3	476.9
	Q3	511.0	523.2	522.8	511.8	503.3	519.8	509.6	525.8	506.0	521.1	521.4	517.0	532.0	518.5	526.2	513.7	511.6	511.6
	Max	552.0	567.9	564.3	553.5	562.7	569.0	539.2	558.3	554.5	583.1	576.5	578.2	606.1	576.0	599.6	580.3	577.8	579.1
Hawaii	Min	266.4	245.3	273.2	277.5	272.4	295.4	278.3	273.5	277.6	267.2	267.6	271.6	263.5	262.0	246.9	266.5	282.7	276.2
	Q1	376.0	380.3	397.3	399.5	393.0	412.3	407.6	403.7	387.2	397.8	402.0	384.0	401.3	390.4	381.8	393.9	397.8	390.3
	Q2	441.5	448.5	462.1	457.5	452.4	467.2	450.5	459.3	440.8	454.9	451.6	443.0	465.4	444.7	445.1	448.3	450.1	445.0
	Q3	503.0	503.0	510.2	505.1	498.5	510.5	493.5	506.0	490.0	500.9	497.4	490.1	523.2	493.0	504.3	490.8	486.5	483.6
	Max	634.9	617.5	612.9	612.6	591.4	623.5	594.2	608.7	589.4	615.0	590.2	581.4	648.9	587.5	625.5	608.0	597.8	587.2

Table 4

The minimum values, the quartile values, and the maximum annual mean values for dry bulb temperature (°C) across each island during each year from 1998 to 2015.

	Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Niihau	Min	24.47	24.66	24.90	25.17	25.14	25.39	25.59	25.27	25.17	25.29	25.28	24.86	24.80	24.97	24.66	24.99	25.33	25.44
	Q1	24.51	24.70	24.94	25.20	25.18	25.42	25.62	25.30	25.20	25.33	25.32	24.90	24.84	25.00	24.70	25.03	25.37	25.48
	Q2	24.54	24.73	24.98	25.23	25.21	25.46	25.64	25.33	25.23	25.36	25.36	24.94	24.87	25.03	24.74	25.07	25.40	25.51
	Q3	24.59	24.78	25.04	25.27	25.25	25.51	25.67	25.37	25.27	25.41	25.42	24.99	24.92	25.07	24.80	25.13	25.45	25.56
	Max	24.65	24.83	25.10	25.32	25.30	25.57	25.72	25.42	25.32	25.47	25.48	25.05	24.98	25.11	24.86	25.19	25.50	25.62
Kauai	Min	24.39	24.55	24.80	25.05	25.05	25.34	25.46	25.16	25.05	25.20	25.21	24.82	24.76	24.89	24.64	24.99	25.30	25.40
	Q1	24.55	24.69	24.96	25.20	25.20	25.50	25.60	25.32	25.21	25.36	25.38	24.98	24.91	25.01	24.78	25.14	25.44	25.56
	Q2	24.67	24.79	25.06	25.32	25.34	25.65	25.72	25.46	25.33	25.48	25.50	25.13	25.05	25.11	24.88	25.26	25.58	25.71
	Q3	24.75	24.84	25.12	25.38	25.41	25.74	25.77	25.52	25.39	25.55	25.57	25.22	25.14	25.15	24.97	25.36	25.66	25.81
	Max	24.88	24.95	25.24	25.49	25.54	25.88	25.86	25.64	25.50	25.67	25.71	25.36	25.28	25.24	25.10	25.50	25.80	25.96
Oahu	Min	24.67	24.66	24.94	25.26	25.38	25.70	25.84	25.51	25.30	25.47	25.38	25.19	25.14	25.21	24.95	25.37	25.71	25.88
	Q1	24.91	24.85	25.16	25.47	25.61	25.94	26.04	25.74	25.50	25.68	25.63	25.45	25.39	25.40	25.19	25.63	25.95	26.16
	Q2	24.98	24.92	25.24	25.55	25.68	26.03	26.10	25.81	25.57	25.75	25.71	25.53	25.47	25.46	25.27	25.70	26.03	26.23
	Q3	25.09	25.01	25.34	25.65	25.79	26.14	26.19	25.91	25.65	25.85	25.82	25.64	25.58	25.55	25.39	25.82	26.14	26.34
	Max	25.19	25.09	25.43	25.73	25.89	26.25	26.26	26.01	25.74	25.94	25.92	25.75	25.69	25.62	25.50	25.92	26.25	26.45
Molokai	Min	24.66	24.59	24.87	25.14	25.32	25.60	25.88	25.49	25.23	25.40	25.25	25.14	25.08	25.18	24.84	25.35	25.67	25.92
	Q1	24.76	24.66	24.95	25.20	25.40	25.69	25.94	25.58	25.28	25.47	25.32	25.23	25.18	25.24	24.93	25.44	25.76	26.02
	Q2	24.82	24.71	25.01	25.25	25.45	25.76	25.99	25.65	25.33	25.52	25.37	25.29	25.25	25.28	24.98	25.50	25.83	26.10
	Q3	24.92	24.78	25.08	25.31	25.53	25.84	26.06	25.72	25.39	25.60	25.45	25.37	25.33	25.34	25.05	25.58	25.91	26.19
	Max	25.14	24.96	25.28	25.47	25.72	26.06	26.21	25.93	25.54	25.77	25.62	25.58	25.54	25.49	25.24	25.79	26.11	26.41
Lanai	Min	24.97	24.82	25.13	25.37	25.61	25.87	26.12	25.79	25.48	25.65	25.49	25.45	25.36	25.38	25.06	25.60	25.93	26.25
	Q1	25.00	24.86	25.17	25.40	25.65	25.92	26.15	25.83	25.51	25.69	25.53	25.49	25.41	25.41	25.10	25.65	25.98	26.29
	Q2	25.02	24.88	25.18	25.42	25.66	25.94	26.17	25.84	25.52	25.71	25.55	25.50	25.42	25.44	25.13	25.67	25.99	26.31
	Q3	25.07	24.90	25.21	25.44	25.69	25.98	26.19	25.88	25.53	25.73	25.57	25.54	25.46	25.45	25.15	25.70	26.03	26.35
	Max	25.10	24.94	25.25	25.47	25.72	26.02	26.21	25.91	25.56	25.76	25.61	25.57	25.50	25.48	25.20	25.75	26.07	26.39
Kahoolawe	Min	24.90	24.69	25.01	25.24	25.53	25.76	26.07	25.70	25.41	25.55	25.37	25.37	25.25	25.26	24.91	25.49	25.85	26.20
	Q1	24.90	24.70	25.01	25.25	25.54	25.77	26.07	25.70	25.41	25.55	25.37	25.37	25.26	25.26	24.91	25.49	25.85	26.20
	Q2	24.90	24.70	25.01	25.25	25.54	25.77	26.08	25.70	25.42	25.55	25.38	25.38	25.26	25.27	24.91	25.50	25.86	26.21
	Q3	24.90	24.70	25.01	25.25	25.54	25.77	26.08	25.70	25.42	25.55	25.38	25.38	25.26	25.27	24.92	25.50	25.86	26.21
	Max	24.90	24.70	25.02	25.25	25.54	25.77	26.08	25.70	25.42	25.55	25.38	25.38	25.26	25.27	24.92	25.50	25.86	26.21
Maui	Min	24.52	24.27	24.59	24.78	25.02	25.33	25.65	25.31	24.94	25.10	24.85	24.90	24.81	24.82	24.50	25.10	25.48	25.78
	Q1	24.65	24.41	24.73	24.91	25.18	25.48	25.78	25.44	25.07	25.23	25.01	25.04	24.95	24.96	24.64	25.23	25.61	25.92
	Q2	24.77	24.54	24.86	25.05	25.33	25.61	25.90	25.56	25.21	25.37	25.16	25.18	25.09	24.78	25.36	25.73	26.05	
	Q3	24.96	24.75	25.07	25.26	25.54	25.84	26.07	25.75	25.38	25.57	25.40	25.40	25.32	25.29	25.01	25.58	25.93	26.25
	Max	25.28	25.09	25.42	25.58	25.86	26.21	26.32	26.07	25.64	25.90	25.76	25.73	25.68	25.60	25.38	25.93	26.25	26.56
Hawaii	Min	18.66	18.28	18.68	18.86	19.25	19.47	19.78	19.54	19.32	19.11	18.87	19.24	18.97	18.96	18.78	19.47	20.04	20.31
	Q1	21.40	21.03	21.45	21.61	21.96	22.18	22.47	22.23	21.91	21.82	21.53	21.84	21.69	21.63	21.41	22.10	22.63	22.94
	Q2	22.55	22.19	22.62	22.77	23.11	23.42	23.63	23.39	23.02	23.01	22.76	23.00	22.95	22.86	22.62	23.37	23.78	24.08
	Q3	24.06	23.76	24.18	24.34	24.67	24.89	25.09	24.88	24.58	24.51	24.29	24.53	24.43	24.39	24.15	24.79	25.22	25.53
	Max	25.47	25.05	25.47	25.62	25.90	26.08	26.22	26.08	25.81	25.67	25.53	25.81	25.71	25.59	25.37	25.91	26.42	26.87

Table 5Monthly averaged global horizontal irradiance (W/m^2) during daylight hours across Hawai'i from 1998 to 2015 with annual means and interannual statistics.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV	Min	Max	Range
January	443.5	393.7	407.7	464.2	393.0	447.5	410.4	414.4	411.0	402.4	417.8	408.5	443.4	401.0	429.5	414.8	400.8	447.5	403.7	419.5	440.0	21.2	5.05%	393.0	464.2	71.1
February	490.9	426.8	515.6	416.7	459.8	465.6	445.8	444.2	416.8	433.7	431.7	426.9	476.0	433.5	452.2	456.5	420.4	487.9	428.1	450.1	464.1	28.2	6.27%	416.7	515.6	98.9
March	478.1	443.6	465.4	442.7	462.7	494.3	399.9	449.2	352.4	438.1	455.8	409.4	462.4	467.7	444.4	412.7	417.3	417.0	417.1	439.6	462.6	33.6	7.65%	352.4	494.3	141.9
April	453.3	473.6	489.9	462.4	472.5	451.4	446.2	493.9	463.4	499.2	465.1	427.1	485.0	453.1	455.4	488.4	487.0	472.2	453.8	468.8	486.5	19.3	4.12%	427.1	499.2	72.1
May	429.2	462.0	494.1	453.7	434.2	539.0	460.2	505.3	425.7	498.4	467.6	454.3	486.8	443.2	483.8	435.0	449.7	439.1	440.1	464.5	486.1	30.9	6.65%	425.7	539.0	113.2
June	438.6	479.1	462.2	463.3	472.1	460.4	463.7	454.4	479.2	475.7	464.3	451.9	491.1	464.4	452.1	485.5	474.0	443.1	455.9	465.3	475.3	14.2	3.04%	438.6	491.1	52.5
July	493.6	504.5	454.5	484.4	481.4	484.8	500.9	489.3	510.1	511.4	469.2	464.6	486.5	484.8	458.6	468.9	478.3	466.7	469.0	482.9	492.5	17.0	3.52%	454.5	511.4	56.9
August	470.8	475.6	463.1	510.9	454.7	502.5	516.1	484.0	491.4	479.4	517.1	483.1	505.8	486.6	471.8	499.3	496.2	434.5	472.7	485.7	501.7	22.0	4.52%	434.5	517.1	82.5
September	431.4	448.3	449.8	479.3	430.4	476.2	504.6	456.3	462.3	441.8	459.9	469.3	495.5	458.0	450.0	489.2	466.6	432.3	448.7	461.2	474.4	21.7	4.70%	430.4	504.6	74.2
October	431.1	433.3	429.7	432.1	432.8	455.9	420.3	422.3	406.9	448.5	428.5	435.8	422.1	432.8	448.1	408.9	426.6	434.8	423.4	430.6	434.4	12.4	2.89%	406.9	455.9	49.0
November	374.5	396.0	418.5	419.7	449.9	391.9	399.4	416.5	422.5	401.6	403.5	399.2	409.7	375.3	403.3	381.9	386.9	392.4	392.0	402.4	414.8	18.7	4.64%	374.5	449.9	75.4
December	381.2	395.9	441.2	412.6	439.6	398.7	409.6	449.8	432.5	360.4	372.5	445.2	397.3	382.0	397.3	385.9	421.3	428.5	388.4	408.4	431.5	26.9	6.59%	360.4	449.8	89.4
Annual Mean	444.9	447.8	458.8	455.7	449.7	466.7	450.9	458.7	442.4	453.2	449.2	441.3	465.9	443.0	447.6	446.7	446.6	441.9	445.3	450.6	455.1	7.8	1.73%	441.3	466.7	25.4

Table 6

Monthly averaged global horizontal irradiance (W/m²) during daylight hours across Kaho’olawe from 1998 to 2015 with annual means and interannual statistics.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV	Min	Max	Range
January	449.6	430.5	441.1	481.7	416.3	446.8	432.8	450.9	457.7	441.3	442.8	444.0	461.8	454.2	461.9	442.8	455.7	485.4	441.6	449.9	457.2	16.8	3.72%	416.3	485.4	69.2
February	527.1	531.3	544.9	509.4	517.0	535.1	486.8	506.8	500.1	517.9	509.6	498.2	510.1	504.0	523.6	474.3	494.0	510.0	501.1	511.1	522.2	17.5	3.43%	474.3	544.9	70.6
March	557.2	536.7	534.9	544.5	567.0	544.4	489.4	506.4	428.5	534.9	549.8	493.4	524.9	533.3	504.2	500.4	521.8	516.6	504.7	521.6	542.5	32.0	6.13%	428.5	567.0	138.5
April	542.7	587.1	578.1	571.9	564.1	562.7	586.1	589.6	556.1	590.5	573.9	539.5	570.4	598.7	566.0	600.0	563.6	556.9	562.9	572.1	586.8	17.6	3.08%	539.5	600.0	60.5
May	505.8	621.1	594.7	563.8	549.3	601.9	562.7	591.4	558.0	603.1	589.3	584.3	602.4	563.5	574.9	555.8	580.9	538.1	559.2	574.5	593.9	27.9	4.86%	505.8	621.1	115.3
June	532.2	562.7	579.3	537.1	555.4	526.2	567.9	580.7	585.2	560.7	559.7	604.6	562.8	540.1	511.7	547.0	553.2	536.1	537.9	555.7	566.6	23.2	4.17%	511.7	604.6	92.9
July	535.0	537.5	565.8	541.2	499.5	506.2	590.3	530.4	538.9	504.6	566.1	550.9	522.4	498.6	504.1	577.8	549.2	546.6	510.3	537.0	550.5	27.5	5.12%	498.6	590.3	91.7
August	544.6	542.3	537.9	543.4	513.1	546.3	560.0	581.0	550.2	560.9	551.6	535.1	520.9	511.1	550.1	599.0	565.3	515.2	535.8	546.0	557.9	23.0	4.21%	511.1	599.0	87.9
September	508.8	575.0	551.5	510.6	538.0	567.2	535.3	518.7	541.3	508.3	534.3	549.7	522.7	549.7	528.6	548.2	540.6	524.1	523.0	536.3	549.3	19.0	3.54%	508.3	575.0	66.7
October	445.8	471.6	468.5	484.4	480.4	492.9	493.9	476.0	486.3	468.4	476.5	507.5	483.6	479.3	500.3	496.7	459.7	498.7	472.7	481.7	493.7	15.6	3.24%	445.8	507.5	61.7
November	389.5	413.7	463.9	449.5	452.2	467.7	468.1	450.6	462.0	467.0	448.7	416.1	452.3	418.5	450.4	428.2	449.5	433.9	429.6	443.4	459.6	22.2	5.00%	389.5	468.1	78.6
December	433.0	420.2	471.2	442.6	479.9	418.8	447.8	462.5	442.1	386.5	425.1	495.6	441.7	419.2	423.7	449.8	423.0	449.2	423.2	440.7	449.6	25.9	5.87%	386.5	495.6	109.1
Annual Mean	500.8	523.5	530.9	517.8	513.3	520.9	522.8	524.0	512.4	516.2	523.4	522.1	517.7	508.7	511.1	522.9	516.9	511.5	512.6	517.6	522.9	7.1	1.38%	500.8	530.9	30.2

Table 7Monthly averaged global horizontal irradiance (W/m²) during daylight hours across Kauai from 1998 to 2015 with annual means and interannual statistics.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean Q3	Sdev COV (%)	Min	Max	Range		
January	415.3	372.4	369.4	422.7	364.6	392.6	409.0	374.3	360.6	370.6	372.8	385.1	399.2	405.5	396.2	383.2	388.1	414.4	372.5	388.7	403.9	19.2	4.93	360.6	422.7	62.1
February	451.4	410.8	459.8	384.6	440.1	444.5	421.2	424.6	371.7	430.2	443.3	408.4	462.4	389.1	404.3	454.1	373.9	468.7	405.4	424.6	449.7	31.0	7.30	371.7	468.7	96.9
March	467.0	449.7	483.6	469.7	432.6	484.1	431.0	455.1	359.2	455.5	481.4	437.8	438.1	462.8	447.7	432.2	445.7	436.3	436.7	448.3	466.0	28.6	6.37	359.2	484.1	124.9
April	403.5	471.6	452.8	447.4	485.8	454.9	430.6	486.1	438.5	493.0	473.2	424.8	441.8	460.8	442.5	457.1	471.6	477.3	442.0	456.3	472.8	23.7	5.20	403.5	493.0	89.5
May	418.0	454.0	519.1	484.4	434.8	487.5	475.0	518.0	470.9	513.4	502.0	488.4	482.6	456.3	501.9	480.5	453.7	481.1	459.9	479.0	498.5	27.8	5.80	418.0	519.1	101.1
June	446.1	478.2	507.5	490.4	518.4	503.1	467.8	499.2	522.6	516.4	505.3	515.9	528.7	481.5	508.4	516.1	519.8	531.4	492.6	503.2	517.9	22.6	4.49	446.1	531.4	85.3
July	508.0	467.0	494.0	506.8	483.2	523.6	543.2	498.9	522.1	518.3	514.6	489.6	485.2	524.8	488.5	530.0	523.0	530.0	490.7	508.4	523.5	20.5	4.03	467.0	543.2	76.3
August	474.6	478.9	492.4	475.7	467.9	505.5	485.4	531.0	491.4	494.0	506.9	472.6	487.8	501.1	506.6	522.4	514.5	480.9	479.4	493.9	506.3	17.9	3.63	467.9	531.0	63.1
September	482.1	470.7	441.2	479.7	459.5	478.6	493.8	468.8	484.1	484.6	488.9	501.2	494.5	502.0	482.7	478.8	496.4	468.3	472.7	480.9	492.6	15.3	3.19	441.2	502.0	60.8
October	426.0	407.3	434.4	402.6	420.0	404.7	434.4	418.9	397.3	415.4	402.6	408.7	451.3	416.4	443.0	424.8	412.7	437.7	407.7	419.9	432.3	15.4	3.67	397.3	451.3	53.9
November	353.6	371.6	394.5	390.6	380.2	374.7	365.1	389.1	410.2	396.3	380.0	391.1	390.3	386.0	398.8	385.0	392.0	371.2	376.0	384.5	391.8	13.5	3.52	353.6	410.2	56.6
December	338.8	318.2	377.5	355.9	377.0	343.7	307.1	416.0	370.5	323.1	335.6	395.4	334.1	364.4	345.6	382.4	372.9	386.0	336.4	358.0	377.4	29.2	8.15	307.1	416.0	108.9
Annual Mean	435.2	433.8	456.0	446.6	441.9	454.3	444.2	461.3	439.1	456.6	456.4	446.9	453.6	450.2	452.3	458.3	452.1	460.6	444.8	450.0	456.3	8.4	1.86	433.8	461.3	27.5

Table 8

Monthly averaged global horizontal irradiance (W/m²) during daylight hours across Lanai from 1998 to 2015 with annual means and interannual statistics.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	445.8	426.0	449.6	447.4	417.1	419.9	418.4	408.6	438.7	414.0	437.9	429.5	431.3	431.1	417.8	411.6	433.2	450.8	417.9	429.4	438.5	13.6	3.16	408.6	450.8	42.2
February	519.5	502.3	505.4	495.5	526.6	537.6	451.1	507.5	479.7	496.0	471.5	493.9	498.4	441.9	483.4	527.7	441.6	478.6	478.9	492.1	507.0	28.1	5.72	441.6	537.6	96.0
March	542.0	528.5	518.6	500.4	534.6	504.7	465.9	518.5	397.8	481.6	504.1	481.8	542.2	520.0	510.0	475.3	514.5	509.1	486.5	502.8	519.7	34.1	6.79	397.8	542.2	144.3
April	569.9	554.7	561.6	553.0	531.3	560.1	562.9	567.4	562.7	584.4	525.7	513.8	543.2	510.6	551.0	546.3	567.7	576.5	544.0	552.4	566.3	20.7	3.74	510.6	584.4	73.8
May	535.6	519.8	540.9	535.9	502.2	575.7	536.3	556.7	549.2	520.3	534.3	501.1	504.8	504.6	580.2	505.3	488.7	548.4	505.0	530.0	546.5	26.2	4.94	488.7	580.2	91.6
June	528.1	563.8	563.5	545.2	557.8	563.4	557.3	558.0	565.1	563.8	521.9	550.5	544.2	517.1	540.3	546.0	584.2	582.4	544.4	552.9	563.7	18.4	3.32	517.1	584.2	67.0
July	585.6	557.9	546.0	570.8	545.2	554.3	576.5	559.5	555.9	531.7	554.4	527.0	544.3	541.0	543.0	552.6	566.8	561.8	544.5	554.1	561.2	15.0	2.70	527.0	585.6	58.6
August	572.0	570.1	566.6	558.4	531.6	572.7	550.8	566.8	553.8	527.0	557.6	563.1	552.3	539.3	566.0	578.3	583.4	526.9	551.1	557.6	569.3	17.0	3.05	526.9	583.4	56.6
September	576.7	571.2	529.1	564.8	545.1	544.9	565.2	552.4	526.3	508.5	533.2	555.5	549.3	545.5	521.2	547.4	535.0	535.3	533.7	544.8	554.7	18.0	3.30	508.5	576.7	68.1
October	480.4	476.9	479.2	493.1	478.4	478.9	473.5	477.2	434.1	482.1	441.7	467.0	481.1	460.6	476.6	468.1	466.3	486.1	467.3	472.3	480.1	14.7	3.11	434.1	493.1	59.0
November	424.8	443.5	459.5	443.7	452.4	454.5	435.4	415.6	438.6	443.7	415.5	449.6	433.0	439.5	449.4	415.6	450.7	437.8	433.6	439.0	449.5	13.6	3.11	415.5	459.5	44.0
December	411.5	390.3	448.8	426.7	471.6	421.7	439.3	465.4	436.1	390.2	386.5	466.4	406.6	437.5	421.1	439.5	434.0	443.9	413.9	429.8	442.8	25.7	5.98	386.5	471.6	85.2
Annual Mean	520.3	513.3	517.4	515.0	510.2	519.6	507.8	517.2	499.6	499.7	495.4	502.6	506.3	494.1	509.6	504.9	510.3	515.3	503.2	508.8	515.3	8.1	1.60	494.1	520.3	26.1

Table 9

Monthly averaged global horizontal irradiance (W/m²) during daylight hours across Maui from 1998 to 2015 with annual means and interannual statistics.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	410.0	386.3	394.0	444.7	384.7	407.3	400.1	405.1	403.8	397.6	395.3	411.3	418.8	412.3	421.5	392.3	406.2	438.4	395.8	407.2	412.0	16.1	3.96	384.7	444.7	60.0
February	476.1	440.3	502.6	445.4	457.4	489.1	428.8	463.8	412.4	447.6	446.9	429.1	448.2	429.8	452.8	473.1	426.1	468.1	432.4	452.1	467.0	23.5	5.21	412.4	502.6	90.2
March	487.6	470.2	472.3	451.4	464.7	483.6	405.7	452.5	373.0	442.6	483.0	452.4	467.9	490.8	449.2	431.3	442.0	448.8	444.2	453.8	471.8	29.6	6.51	373.0	490.8	117.9
April	440.3	512.4	498.5	489.7	486.1	495.7	472.7	501.3	479.1	525.3	497.6	445.2	524.6	504.2	502.4	501.2	501.0	506.8	487.0	493.6	503.8	22.7	4.61	440.3	525.3	85.0
May	450.8	510.3	528.0	482.5	476.2	542.0	495.3	532.6	458.4	525.3	522.2	476.2	515.4	503.0	530.2	460.8	484.6	469.4	476.2	498.0	524.5	29.0	5.82	450.8	542.0	91.2
June	470.6	532.3	519.1	489.4	502.6	515.4	518.0	507.5	536.2	527.1	536.0	521.7	536.3	504.9	496.5	515.6	538.6	511.4	505.5	515.5	531.0	18.3	3.55	470.6	538.6	68.0
July	538.9	529.9	491.1	530.3	500.2	509.3	546.2	514.5	535.7	525.7	526.9	504.6	522.7	524.3	497.5	515.9	526.5	528.9	510.6	520.5	529.6	15.1	2.89	491.1	546.2	55.1
August	507.5	497.5	485.6	513.9	477.9	516.1	526.1	520.7	532.4	517.6	542.4	519.9	540.6	504.8	527.0	551.2	545.7	469.4	505.4	516.5	531.0	23.1	4.47	469.4	551.2	81.8
September	480.8	500.4	462.2	498.0	472.8	504.7	516.5	487.9	504.0	471.8	494.0	527.3	521.8	510.5	488.3	534.5	519.7	474.4	482.6	498.3	515.0	21.0	4.21	462.2	534.5	72.4
October	435.3	444.5	434.0	432.6	449.7	459.2	440.5	440.5	428.7	457.0	442.1	455.1	453.5	445.1	476.2	437.5	440.0	443.3	438.1	445.3	452.5	11.6	2.60	428.7	476.2	47.5
November	379.4	397.9	423.6	422.0	421.4	397.7	399.9	399.0	422.8	424.0	406.2	420.7	418.0	404.4	420.2	387.0	397.5	406.4	398.2	408.2	421.3	13.8	3.39	379.4	424.0	44.5
December	373.9	377.6	433.2	390.8	440.6	362.5	393.5	437.6	421.9	371.0	386.7	452.2	400.8	396.9	395.7	418.1	409.7	432.4	387.7	405.3	429.7	26.7	6.58	362.5	452.2	89.7
Annual Mean	458.3	471.8	473.2	469.1	463.5	478.0	467.0	475.5	463.8	474.5	478.8	471.1	485.1	473.3	475.4	471.8	474.5	468.9	469.0	471.9	475.2	6.2	1.32	458.3	485.1	26.8

Table 10

Monthly averaged global horizontal irradiance (W/m²) during daylight hours across Moloka'i from 1998 to 2015 with annual means and interannual statistics.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	443.4	396.4	411.4	437.1	396.7	402.1	412.8	390.1	411.6	411.4	414.5	407.2	416.6	428.9	413.2	385.8	414.0	433.8	403.4	412.6	416.1	15.7	3.79	385.8	443.4	57.6
February	504.4	475.9	505.9	469.7	472.4	499.9	437.5	480.1	439.4	474.9	470.3	445.1	466.0	448.0	461.1	485.2	421.5	455.2	449.8	467.4	479.0	23.5	5.03	421.5	505.9	84.4
March	518.2	498.3	508.9	498.7	497.0	488.3	437.3	484.0	379.2	483.9	514.6	472.6	499.3	510.6	489.0	462.1	483.0	484.9	483.2	483.9	499.2	32.6	6.74	379.2	518.2	139.0
April	503.0	559.1	517.2	527.8	523.2	558.0	539.1	542.3	524.0	561.2	512.4	497.5	516.9	521.9	525.5	547.3	524.6	571.9	518.4	531.8	546.1	21.0	3.94	497.5	571.9	74.4
May	508.0	524.6	549.0	522.3	523.1	568.2	526.9	573.4	533.8	539.6	546.1	523.4	530.3	518.9	570.5	514.7	504.5	536.1	522.5	534.1	544.5	20.5	3.83	504.5	573.4	68.9
June	521.6	570.2	570.6	538.4	553.4	559.6	558.4	559.1	578.2	572.8	551.2	551.6	556.0	517.8	534.1	545.1	580.7	585.2	546.6	555.8	570.5	19.2	3.46	517.8	585.2	67.4
July	555.5	553.6	536.5	573.7	527.8	541.6	589.5	559.6	548.9	544.1	556.3	534.9	529.1	541.0	545.2	539.6	568.4	581.3	539.9	551.5	558.8	17.5	3.18	527.8	589.5	61.7
August	552.5	535.2	529.7	540.3	529.1	557.7	554.5	561.2	551.5	547.0	560.0	543.2	556.3	540.1	562.7	586.7	575.4	513.6	540.2	549.8	559.4	17.4	3.16	513.6	586.7	73.2
September	540.7	550.4	523.6	538.2	528.2	537.1	556.5	525.4	531.5	516.6	519.7	554.6	552.1	551.0	535.1	547.0	557.3	527.6	527.8	538.5	550.8	13.3	2.47	516.6	557.3	40.7
October	461.4	464.0	462.8	461.1	472.0	478.8	460.6	455.7	435.5	464.1	440.5	464.6	472.6	452.8	476.3	463.3	462.3	448.8	456.9	460.9	464.5	11.3	2.45	435.5	478.8	43.3
November	392.0	417.9	445.2	436.9	436.8	419.2	427.3	413.5	438.4	438.8	414.7	427.7	435.5	420.8	440.3	404.4	426.6	406.7	415.5	424.6	436.9	14.6	3.43	392.0	445.2	53.2
December	399.1	373.7	436.4	391.4	451.0	382.9	405.2	456.5	430.9	371.1	381.7	450.8	404.3	401.9	387.0	427.7	404.1	420.5	388.1	409.8	430.1	27.2	6.64	371.1	456.5	85.4
Annual Mean	495.9	499.0	503.8	499.1	496.0	504.9	498.2	505.3	489.4	499.5	496.2	493.6	499.2	492.1	500.6	497.5	499.7	502.3	496.1	498.5	500.3	4.2	0.85	489.4	505.3	15.9

Table 11Monthly averaged global horizontal irradiance (W/m^2) during daylight hours across Ni'ihau from 1998 to 2015 with annual means and interannual statistics.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	450.6	446.1	443.0	463.2	409.9	430.6	453.3	426.8	444.8	447.1	436.8	450.0	425.3	433.4	443.6	455.5	448.3	432.6	432.8	441.2	449.6	12.9	2.93	409.9	463.2	53.3
February	523.1	506.6	518.9	472.2	517.5	514.0	493.6	482.4	423.6	515.9	503.8	495.2	523.7	437.5	476.3	518.2	420.7	517.3	477.8	492.3	517.4	33.9	6.89	420.7	523.7	103.0
March	562.7	547.4	562.5	551.9	513.5	551.1	532.1	536.2	405.7	536.4	548.0	510.9	547.9	544.0	501.8	504.4	548.7	527.0	516.9	529.6	548.5	36.1	6.82	405.7	562.7	157.0
April	525.8	559.2	514.6	546.7	559.3	523.1	520.7	575.6	551.8	573.4	531.8	515.9	519.7	530.5	533.0	544.7	549.6	565.8	523.8	541.2	557.4	20.0	3.69	514.6	575.6	61.0
May	510.2	552.0	574.8	565.0	535.5	548.5	567.1	573.1	570.6	567.7	552.4	569.3	559.4	540.0	588.2	587.6	542.6	562.5	549.4	559.2	570.3	19.3	3.45	510.2	588.2	78.0
June	554.4	548.5	574.8	553.2	576.4	577.5	547.7	605.3	572.2	583.3	553.0	597.4	557.5	566.8	571.3	573.1	590.2	577.8	555.2	571.1	577.7	16.6	2.91	547.7	605.3	57.6
July	585.9	523.1	562.7	570.2	538.8	573.6	602.3	561.7	570.7	567.0	558.6	546.2	531.4	570.8	561.2	583.1	559.9	589.8	558.9	564.3	572.9	20.2	3.59	523.1	602.3	79.3
August	541.3	558.1	557.1	519.8	524.3	570.9	548.2	575.1	549.5	558.5	548.3	516.3	536.9	544.9	542.6	563.5	577.3	565.8	541.6	549.9	562.3	17.9	3.26	516.3	577.3	61.0
September	551.7	522.7	506.5	524.4	539.2	512.2	563.0	542.7	547.7	529.4	535.7	549.4	515.6	527.1	559.4	545.5	555.0	561.1	525.0	538.2	551.1	17.4	3.24	506.5	563.0	56.5
October	485.1	442.6	498.3	468.0	466.5	463.0	494.9	484.8	449.1	472.6	452.4	459.1	495.1	460.8	470.2	468.7	465.3	521.3	461.4	473.2	485.0	19.9	4.21	442.6	521.3	78.7
November	440.6	431.4	472.3	428.8	444.4	465.3	414.7	468.3	451.4	457.8	439.0	450.8	452.7	462.4	433.7	443.6	460.1	429.7	435.0	447.1	459.5	15.8	3.53	414.7	472.3	57.5
December	398.0	378.4	427.3	419.8	428.4	404.4	355.6	433.3	428.4	405.8	387.7	422.1	381.0	422.1	410.2	418.3	413.3	442.9	399.6	409.8	426.0	22.4	5.48	355.6	442.9	87.3
Annual Mean	514.0	505.8	521.2	510.8	507.8	515.2	514.2	526.8	503.3	522.2	508.9	510.4	507.7	507.8	512.7	521.4	516.3	528.7	508.1	514.2	520.0	7.3	1.42	503.3	528.7	25.4

Table 12

Monthly averaged global horizontal irradiance (W/m²) during daylight hours across O'ahu from 1998 to 2015 with annual means and interannual statistics.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	419.9	368.3	391.0	394.1	376.3	378.6	391.0	359.7	366.7	376.5	379.8	370.3	401.4	406.5	390.2	358.8	400.1	398.5	371.8	384.9	397.4	17.0	4.42	358.8	419.9	61.0
February	449.7	451.1	466.9	422.4	444.4	455.8	419.4	440.4	386.5	435.8	445.4	415.3	434.0	425.0	417.4	441.6	394.8	457.2	420.2	433.5	448.6	21.5	4.95	386.5	466.9	80.5
March	477.0	456.4	485.2	456.6	472.2	467.2	441.0	469.6	339.6	439.7	491.5	447.6	447.8	454.3	440.3	450.1	459.1	456.2	447.7	452.9	469.0	32.0	7.07	339.6	491.5	151.9
April	445.8	502.1	451.8	476.1	498.5	515.9	496.3	504.4	470.3	498.7	484.5	453.9	466.0	483.1	459.8	460.4	475.4	508.4	461.8	480.6	498.6	21.6	4.49	445.8	515.9	70.0
May	452.9	464.5	505.0	495.7	468.2	529.6	490.5	521.2	495.2	499.8	504.2	486.6	468.0	468.2	522.1	485.6	456.2	492.3	468.2	489.2	503.1	22.7	4.65	452.9	529.6	76.7
June	463.9	504.3	545.0	493.3	530.5	509.3	494.1	521.1	537.5	543.6	510.5	514.2	501.6	482.2	502.3	485.0	542.3	538.1	496.0	512.2	535.7	23.8	4.65	463.9	545.0	81.1
July	496.7	479.3	496.9	518.3	502.2	528.8	547.3	527.7	516.5	508.2	531.7	493.9	492.7	505.8	498.8	504.9	529.8	536.9	497.4	512.0	528.5	18.4	3.60	479.3	547.3	68.0
August	504.2	514.4	510.5	491.7	483.0	515.3	486.1	538.3	507.4	513.0	513.0	489.8	497.1	499.0	519.5	544.4	527.0	482.6	493.1	507.6	515.1	17.9	3.53	482.6	544.4	61.9
September	501.0	513.0	466.9	516.6	492.4	505.6	517.0	483.9	499.6	500.2	499.3	512.3	520.0	522.5	479.5	493.6	521.6	452.1	492.7	499.8	515.7	19.5	3.90	452.1	522.5	70.3
October	451.8	417.5	438.6	420.2	435.7	431.0	443.5	430.3	395.3	435.5	416.8	437.5	442.1	429.5	440.6	422.6	435.9	423.7	422.9	430.5	438.4	13.0	3.02	395.3	451.8	56.5
November	359.6	378.9	397.9	398.0	408.8	392.5	394.0	385.0	417.0	403.2	379.9	393.1	400.0	401.2	406.6	396.4	418.8	366.9	386.9	394.3	402.7	15.6	3.97	359.6	418.8	59.2
December	346.2	336.7	394.4	356.5	411.0	354.1	370.7	428.9	384.2	342.5	335.1	411.1	370.8	377.2	341.2	402.9	380.0	388.8	348.2	374.0	393.0	28.5	7.63	335.1	428.9	93.9
Annual Mean	451.3	453.8	466.7	457.6	463.5	470.4	462.7	472.8	449.2	463.8	463.8	456.3	457.3	458.1	456.8	458.4	466.8	463.1	457.0	460.7	463.8	6.4	1.38	449.2	472.8	23.6

Table 13

Monthly averaged dry-bulb temperature (°C) across Hawai'i for years 1998–2015 with annual means and interannual statistics of monthly values.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	22.3	21.4	20.4	21.9	21.7	22.2	22.5	22.8	21.7	21.7	20.8	21.2	22.8	22.0	21.8	21.5	22.2	22.5	21.5	21.9	22.3	0.6	2.96	20.4	22.8	2.4
February	21.5	21.0	21.5	21.2	20.9	21.2	22.7	21.7	21.2	21.3	21.7	20.1	21.8	22.6	21.5	20.5	23.2	23.2	21.2	21.6	21.7	0.8	3.91	20.1	23.2	3.0
March	22.4	21.0	21.6	21.4	21.7	22.9	22.3	22.2	21.9	22.4	21.9	20.6	21.3	22.2	21.3	21.8	22.6	22.0	21.5	21.9	22.3	0.6	2.72	20.6	22.9	2.3
April	21.1	21.2	21.0	21.5	23.0	22.2	22.8	22.4	21.7	22.2	22.2	21.6	21.8	22.9	21.7	23.2	22.4	22.8	21.6	22.1	22.7	0.7	3.10	21.0	23.2	2.1
May	21.5	22.3	22.6	22.6	23.6	23.3	23.9	23.8	22.5	23.0	22.6	24.0	22.8	22.8	22.4	24.0	23.9	23.1	22.6	23.0	23.7	0.7	3.05	21.5	24.0	2.4
June	22.8	22.6	23.5	23.0	23.8	24.1	24.0	23.7	23.6	23.7	23.4	24.0	23.4	23.0	22.9	23.7	23.9	24.6	23.1	23.5	23.9	0.5	2.19	22.6	24.6	2.0
July	23.5	23.2	23.8	23.9	24.1	24.3	24.5	24.2	24.1	24.0	24.2	24.2	23.7	23.5	23.5	24.4	24.7	25.9	23.8	24.1	24.3	0.6	2.50	23.2	25.9	2.7
August	24.3	23.5	24.2	24.4	24.5	24.6	25.0	24.8	24.7	24.5	24.0	24.8	23.8	23.9	23.9	24.7	25.2	26.3	24.0	24.5	24.8	0.6	2.59	23.5	26.3	2.8
September	23.8	23.4	24.4	24.3	24.3	25.0	25.1	24.8	24.3	24.3	24.2	24.6	24.0	24.1	23.8	24.7	25.8	26.2	24.1	24.5	24.8	0.7	2.83	23.4	26.2	2.8
October	23.4	23.3	23.5	23.8	24.1	25.0	24.5	23.6	24.6	23.6	23.6	24.9	23.7	23.5	24.1	24.6	25.1	25.6	23.6	24.1	24.6	0.7	2.80	23.3	25.6	2.3
November	22.4	21.9	22.5	23.4	23.4	23.1	23.8	23.5	24.0	23.0	22.8	23.1	23.0	22.3	22.7	23.6	23.8	24.0	22.7	23.1	23.6	0.6	2.61	21.9	24.0	2.1
December	21.4	21.6	22.2	22.1	22.2	22.4	22.3	22.8	22.2	22.0	21.7	22.9	22.5	21.4	21.9	22.7	22.4	22.7	21.9	22.2	22.5	0.5	2.04	21.4	22.9	1.5
Annual Mean	22.6	22.2	22.6	22.8	23.1	23.4	23.6	23.4	23.1	23.0	22.8	23.0	22.9	22.8	22.6	23.3	23.8	24.1	22.8	23.1	23.4	0.5	2.02	22.2	24.1	1.9

Table 14

Monthly averaged dry-bulb temperature (°C) across Kaho'olawe for years 1998–2015 with annual means and interannual statistics of monthly values.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	24.4	23.7	23.0	24.5	24.1	24.3	24.7	24.8	24.4	24.6	23.7	23.8	24.7	24.4	24.3	23.7	24.2	24.3	23.9	24.2	24.5	0.5	1.88	23.0	24.8	1.8
February	23.9	23.5	23.9	24.0	23.3	23.7	25.1	24.2	23.4	23.7	24.0	23.0	24.1	25.0	23.9	23.1	24.9	24.8	23.5	24.0	24.2	0.6	2.62	23.0	25.1	2.1
March	24.6	23.5	23.9	24.0	24.0	25.0	24.4	24.0	24.2	24.7	24.5	22.8	23.8	24.5	23.5	23.6	24.3	24.1	23.8	24.1	24.5	0.5	2.16	22.8	25.0	2.2
April	23.6	23.8	23.3	24.0	25.3	24.9	24.9	24.7	23.9	24.7	24.6	23.5	24.2	25.4	24.1	25.0	24.5	25.3	23.9	24.4	24.9	0.7	2.69	23.3	25.4	2.1
May	23.8	25.0	24.8	24.9	25.9	25.6	26.0	26.0	24.5	25.5	25.2	25.9	25.3	25.3	24.6	25.8	26.1	25.1	24.9	25.3	25.9	0.6	2.49	23.8	26.1	2.3
June	25.0	25.0	25.8	25.3	26.2	26.3	26.4	26.1	26.0	26.3	26.0	26.4	25.6	25.3	25.0	25.8	26.2	26.4	25.4	25.8	26.3	0.5	1.97	25.0	26.4	1.4
July	25.6	25.4	26.1	26.3	26.3	26.6	27.2	26.6	26.3	26.4	26.8	26.7	25.9	25.7	25.5	26.6	26.9	27.9	26.0	26.4	26.7	0.6	2.35	25.4	27.9	2.4
August	26.4	26.0	26.5	26.6	26.9	27.0	27.7	27.2	27.0	26.9	26.5	27.0	26.1	26.1	26.0	26.8	27.3	28.4	26.4	26.8	27.0	0.6	2.29	26.0	28.4	2.4
September	26.3	25.8	26.7	26.7	26.9	27.5	27.7	27.2	26.8	26.9	26.6	26.9	26.3	26.3	26.0	27.1	28.0	28.4	26.4	26.9	27.1	0.7	2.51	25.8	28.4	2.5
October	25.9	25.8	26.0	26.2	26.5	27.5	27.1	26.3	26.9	26.4	26.3	27.4	26.3	26.1	26.2	26.9	27.4	27.7	26.2	26.6	27.0	0.6	2.21	25.8	27.7	1.9
November	25.1	24.6	25.1	25.7	26.0	25.7	26.5	25.9	26.4	25.8	25.5	25.7	25.6	24.9	25.1	26.0	26.0	26.6	25.2	25.7	26.0	0.6	2.17	24.6	26.6	2.0
December	24.1	24.1	24.9	24.6	25.0	24.9	25.1	25.2	25.0	24.7	24.7	25.2	25.1	24.0	24.6	25.5	24.5	25.5	24.6	24.8	25.1	0.4	1.79	24.0	25.5	1.5
Annual Mean	24.9	24.7	25.0	25.2	25.5	25.8	26.1	25.7	25.4	25.6	25.4	25.4	25.3	25.3	24.9	25.5	25.9	26.2	25.3	25.4	25.7	0.4	1.59	24.7	26.2	1.5

Table 15

Monthly averaged dry-bulb temperature (°C) across Kauai for years 1998–2015 with annual means and interannual statistics of monthly values.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	23.5	23.5	22.8	24.7	23.6	23.2	24.0	23.8	24.1	24.3	23.3	23.5	23.6	23.9	24.1	23.2	23.6	23.5	23.5	23.7	24.0	0.5	1.90	22.8	24.7	1.9
February	23.1	23.2	23.8	23.7	22.6	23.1	24.5	23.3	22.9	23.3	24.0	22.6	22.9	24.1	23.5	22.9	23.6	23.8	23.0	23.4	23.7	0.5	2.28	22.6	24.5	1.9
March	24.3	23.3	23.9	23.9	23.0	24.6	23.2	23.1	23.8	24.3	24.7	22.6	23.1	24.0	23.0	22.8	23.4	22.9	23.0	23.6	24.0	0.6	2.74	22.6	24.7	2.1
April	23.3	24.0	23.1	24.0	24.9	24.7	24.2	24.4	23.6	24.4	24.5	23.0	23.5	24.9	24.0	24.4	24.0	24.9	23.7	24.1	24.5	0.6	2.49	23.0	24.9	1.9
May	23.6	25.3	25.2	25.3	25.7	25.8	25.5	26.0	24.4	25.8	25.8	25.4	25.4	25.1	24.7	25.4	25.8	24.9	25.1	25.3	25.8	0.6	2.34	23.6	26.0	2.4
June	24.9	25.4	26.1	25.6	26.6	26.9	26.3	26.5	26.3	26.4	26.2	26.6	26.0	25.4	25.3	26.0	26.3	26.4	25.7	26.1	26.4	0.5	2.04	24.9	26.9	1.9
July	25.6	25.7	26.2	26.7	26.5	26.9	27.4	26.6	26.5	26.7	26.8	26.7	26.3	26.0	25.6	26.7	27.1	27.7	26.2	26.5	26.8	0.6	2.20	25.6	27.7	2.2
August	26.4	26.3	26.6	26.8	26.9	27.2	27.8	27.3	27.0	27.1	26.9	26.9	26.5	26.2	26.1	27.1	27.5	28.1	26.5	26.9	27.1	0.5	2.03	26.1	28.1	2.0
September	26.3	26.2	26.6	26.9	27.2	27.5	27.7	27.2	27.1	26.9	27.0	27.0	26.5	26.4	26.1	27.3	28.2	28.0	26.6	27.0	27.3	0.6	2.23	26.1	28.2	2.1
October	25.9	25.7	26.2	26.1	26.6	27.3	27.0	26.3	26.8	26.3	26.4	27.1	26.5	26.1	26.4	26.8	27.6	26.6	26.2	26.5	26.8	0.5	1.86	25.7	27.6	1.9
November	25.1	24.7	25.1	25.4	25.5	25.8	26.0	25.6	26.2	25.6	25.5	25.4	25.5	24.8	25.3	25.5	25.7	26.3	25.3	25.5	25.7	0.4	1.66	24.7	26.3	1.6
December	23.9	23.9	24.9	24.6	24.6	24.4	24.6	24.8	24.7	24.3	24.6	24.3	24.6	23.9	24.5	24.9	24.0	25.1	24.3	24.5	24.7	0.4	1.52	23.9	25.1	1.3
Annual Mean	24.7	24.8	25.0	25.3	25.3	25.6	25.7	25.4	25.3	25.5	25.5	25.1	25.0	25.1	24.9	25.3	25.6	25.7	25.1	25.3	25.5	0.3	1.22	24.7	25.7	1.0

Table 16
 Monthly averaged dry-bulb temperature (°C) across Lanai for years 1998–2015 with annual means and interannual statistics of monthly values.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	24.4	23.7	23.0	24.6	24.0	24.2	24.6	24.7	24.4	24.6	23.6	23.8	24.7	24.4	24.4	23.7	24.2	24.2	23.8	24.2	24.5	0.5	1.91	23.0	24.7	1.7
February	23.9	23.6	24.1	24.0	23.2	23.7	25.1	24.1	23.4	23.7	24.1	22.9	24.0	25.0	24.0	23.1	24.8	24.8	23.6	24.0	24.1	0.6	2.66	22.9	25.1	2.2
March	24.8	23.6	24.1	24.1	24.0	25.1	24.3	24.1	24.1	24.7	24.7	22.9	23.8	24.6	23.5	23.7	24.3	24.1	23.9	24.1	24.5	0.5	2.22	22.9	25.1	2.2
April	23.7	24.1	23.5	24.2	25.5	25.0	25.0	24.9	23.9	24.9	24.8	23.6	24.3	25.7	24.3	25.3	24.6	25.4	24.1	24.6	25.0	0.7	2.79	23.5	25.7	2.2
May	24.0	25.2	25.1	25.2	26.1	25.9	26.1	26.4	24.6	25.8	25.6	26.3	25.6	25.5	25.0	26.1	26.4	25.3	25.2	25.6	26.1	0.7	2.56	24.0	26.4	2.4
June	25.2	25.4	26.2	25.5	26.5	26.8	26.7	26.5	26.4	26.7	26.3	26.7	26.0	25.5	25.3	26.1	26.5	26.8	25.7	26.2	26.6	0.5	2.08	25.2	26.8	1.6
July	25.9	25.7	26.3	26.6	26.6	26.9	27.6	26.9	26.7	26.8	27.1	26.9	26.3	26.1	25.9	26.9	27.2	28.2	26.3	26.7	26.9	0.6	2.32	25.7	28.2	2.4
August	26.6	26.3	26.8	27.0	27.1	27.3	28.0	27.5	27.3	27.2	26.8	27.2	26.5	26.4	26.4	27.2	27.6	28.6	26.7	27.1	27.3	0.6	2.16	26.3	28.6	2.2
September	26.5	26.2	26.9	27.0	27.2	27.8	28.0	27.4	27.1	27.1	26.9	27.2	26.6	26.7	26.3	27.4	28.3	28.5	26.7	27.2	27.4	0.7	2.41	26.2	28.5	2.4
October	26.1	26.0	26.2	26.4	26.6	27.7	27.1	26.5	27.0	26.5	26.5	27.6	26.5	26.4	26.6	27.0	27.6	27.7	26.4	26.8	27.1	0.6	2.08	26.0	27.7	1.7
November	25.1	24.7	25.1	25.8	26.0	25.8	26.5	25.9	26.4	25.8	25.5	25.7	25.6	24.9	25.2	26.0	26.1	26.7	25.3	25.7	26.0	0.5	2.12	24.7	26.7	2.0
December	24.1	24.0	25.0	24.6	25.0	24.8	25.1	25.2	24.9	24.6	24.6	25.1	25.1	24.0	24.6	25.5	24.5	25.5	24.6	24.8	25.1	0.5	1.82	24.0	25.5	1.5
Annual Mean	25.0	24.9	25.2	25.4	25.7	26.0	26.2	25.9	25.5	25.7	25.6	25.5	25.4	25.4	25.1	25.7	26.0	26.3	25.4	25.6	25.8	0.4	1.51	24.9	26.3	1.4

Table 17

Monthly averaged dry-bulb temperature (°C) across Maui for years 1998–2015 with annual means and interannual statistics of monthly values.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	24.5	23.5	22.8	24.4	23.8	24.3	24.6	24.8	24.2	24.4	23.4	23.7	24.7	24.3	24.3	23.6	24.1	24.3	23.7	24.1	24.4	0.5	2.19	22.8	24.8	2.0
February	23.8	23.3	23.9	23.8	23.0	23.5	25.0	23.9	23.1	23.6	23.9	22.6	23.9	24.9	23.8	22.8	24.8	24.8	23.4	23.8	23.9	0.7	2.99	22.6	25.0	2.4
March	24.6	23.3	23.9	23.8	23.7	25.0	24.1	24.0	24.0	24.7	24.3	22.7	23.6	24.4	23.3	23.6	24.1	23.9	23.6	23.9	24.3	0.6	2.32	22.7	25.0	2.3
April	23.5	23.7	23.2	23.8	25.2	24.6	24.7	24.6	23.6	24.5	24.5	23.4	24.0	25.3	23.9	25.2	24.3	25.1	23.8	24.3	24.7	0.7	2.81	23.2	25.3	2.1
May	23.7	24.9	24.8	24.8	25.7	25.5	25.9	26.0	24.3	25.4	25.3	26.1	25.3	25.2	24.6	25.8	26.2	25.0	24.8	25.2	25.8	0.7	2.63	23.7	26.2	2.5
June	25.0	25.0	25.8	25.1	26.1	26.3	26.3	26.1	25.9	26.2	25.8	26.3	25.6	25.2	25.0	25.8	26.1	26.4	25.3	25.8	26.2	0.5	1.97	25.0	26.4	1.4
July	25.6	25.4	26.0	26.2	26.2	26.5	27.2	26.5	26.3	26.4	26.6	26.5	25.9	25.7	25.5	26.5	26.8	27.8	26.0	26.3	26.5	0.6	2.29	25.4	27.8	2.4
August	26.4	26.0	26.5	26.6	26.7	27.0	27.7	27.1	26.9	26.8	26.4	26.9	26.1	26.1	26.0	26.8	27.2	28.3	26.4	26.8	27.0	0.6	2.25	26.0	28.3	2.4
September	26.2	25.8	26.6	26.6	26.8	27.5	27.6	27.1	26.7	26.7	26.5	26.8	26.2	26.2	25.9	27.0	28.0	28.3	26.3	26.8	27.1	0.7	2.55	25.8	28.3	2.5
October	25.8	25.8	25.9	26.1	26.3	27.5	26.9	26.1	26.8	26.2	26.2	27.2	26.2	26.0	26.3	26.8	27.3	27.5	26.1	26.5	26.9	0.6	2.21	25.8	27.5	1.8
November	24.9	24.4	24.9	25.6	25.8	25.6	26.3	25.8	26.2	25.6	25.3	25.4	25.4	24.7	25.0	25.8	25.9	26.5	25.1	25.5	25.8	0.6	2.25	24.4	26.5	2.1
December	23.9	24.0	24.8	24.5	24.8	24.6	24.9	25.1	24.7	24.4	24.4	25.1	25.0	23.8	24.4	25.2	24.4	25.3	24.4	24.6	25.0	0.5	1.83	23.8	25.3	1.5
Annual Mean	24.8	24.6	24.9	25.1	25.4	25.7	25.9	25.6	25.2	25.4	25.2	25.2	25.2	25.1	24.9	25.4	25.8	26.1	25.1	25.3	25.6	0.4	1.58	24.6	26.1	1.5

Table 18
 Monthly averaged dry-bulb temperature (°C) across Moloka'i for years 1998–2015 with annual means and interannual statistics of monthly values.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	24.2	23.5	22.9	24.5	23.8	24.0	24.4	24.6	24.3	24.5	23.4	23.7	24.5	24.2	24.3	23.6	24.0	24.0	23.7	24.0	24.4	0.5	1.92	22.9	24.6	1.7
February	23.7	23.4	23.9	23.8	23.0	23.5	25.0	23.9	23.2	23.6	24.0	22.7	23.8	24.8	23.9	22.9	24.6	24.5	23.4	23.8	24.0	0.6	2.67	22.7	25.0	2.3
March	24.6	23.4	23.9	23.9	23.7	24.9	24.0	23.9	24.0	24.5	24.6	22.8	23.6	24.5	23.4	23.4	24.1	23.8	23.7	23.9	24.4	0.5	2.24	22.8	24.9	2.2
April	23.5	23.9	23.3	24.0	25.3	24.9	24.8	24.7	23.7	24.6	24.6	23.4	24.0	25.5	24.2	25.2	24.4	25.2	23.9	24.4	24.8	0.7	2.82	23.3	25.5	2.3
May	23.8	25.0	25.0	25.0	25.9	25.7	25.9	26.2	24.4	25.6	25.5	26.0	25.5	25.4	24.8	25.9	26.3	25.0	25.0	25.4	25.9	0.6	2.55	23.8	26.3	2.5
June	25.0	25.3	26.0	25.4	26.4	26.6	26.5	26.3	26.2	26.5	26.1	26.5	25.9	25.4	25.2	26.0	26.3	26.6	25.5	26.0	26.5	0.5	2.03	25.0	26.6	1.6
July	25.7	25.6	26.2	26.5	26.4	26.7	27.5	26.7	26.4	26.6	26.8	26.7	26.2	25.9	25.7	26.7	27.0	28.0	26.2	26.5	26.7	0.6	2.31	25.6	28.0	2.4
August	26.4	26.2	26.6	26.8	27.0	27.1	27.9	27.3	27.1	27.0	26.7	27.0	26.3	26.3	26.2	27.1	27.5	28.4	26.5	26.9	27.1	0.6	2.14	26.2	28.4	2.2
September	26.3	26.0	26.7	26.8	27.0	27.6	27.8	27.2	26.9	26.9	26.7	27.0	26.5	26.5	26.1	27.3	28.2	28.3	26.6	27.0	27.3	0.7	2.43	26.0	28.3	2.3
October	25.9	25.9	26.1	26.2	26.5	27.6	27.0	26.3	26.9	26.4	26.4	27.4	26.4	26.2	26.5	26.9	27.5	27.4	26.3	26.6	27.0	0.5	2.04	25.9	27.6	1.7
November	25.0	24.6	25.0	25.6	25.8	25.7	26.3	25.7	26.2	25.7	25.4	25.6	25.5	24.8	25.1	25.9	25.9	26.6	25.2	25.6	25.8	0.5	2.08	24.6	26.6	2.0
December	24.0	23.9	24.9	24.6	24.9	24.7	25.0	25.0	24.8	24.5	24.5	24.9	24.9	23.9	24.5	25.3	24.4	25.4	24.5	24.7	24.9	0.4	1.76	23.9	25.4	1.5
Annual Mean	24.9	24.7	25.0	25.3	25.5	25.8	26.0	25.7	25.4	25.5	25.4	25.3	25.3	25.3	25.0	25.5	25.8	26.1	25.3	25.4	25.6	0.4	1.49	24.7	26.1	1.4

Table 19

Monthly averaged dry-bulb temperature (°C) across Ni'ihau for years 1998–2015 with annual means and interannual statistics of monthly values.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	23.3	23.5	22.9	24.6	23.7	23.0	24.0	23.8	24.2	24.3	23.4	23.5	23.4	24.0	24.0	23.3	23.5	23.3	23.7	24.0	0.5	1.97	22.9	24.6	1.7	
February	22.9	23.2	23.7	23.6	22.7	23.1	24.5	23.4	23.0	23.3	23.8	22.7	22.6	24.0	23.4	22.9	23.4	23.5	22.9	23.3	23.6	0.5	2.10	22.6	24.5	1.8
March	24.0	23.3	23.8	23.8	22.9	24.2	23.3	23.0	23.9	24.0	24.6	22.6	22.9	24.1	23.0	22.6	23.2	22.8	22.9	23.4	23.9	0.6	2.60	22.6	24.6	2.0
April	23.3	23.9	23.2	24.1	24.5	24.7	24.1	24.3	23.7	24.2	24.3	22.8	23.4	24.7	23.9	24.1	23.9	24.7	23.7	24.0	24.3	0.5	2.24	22.8	24.7	1.9
May	23.6	25.1	25.0	25.1	25.6	25.6	25.3	25.8	24.3	25.5	25.5	24.7	25.1	25.0	24.5	25.0	25.3	24.8	24.8	25.1	25.4	0.5	2.16	23.6	25.8	2.2
June	24.9	25.3	25.9	25.6	26.5	26.6	26.3	26.4	26.1	26.3	26.1	26.4	25.8	25.4	25.1	25.8	26.1	26.2	25.7	25.9	26.3	0.5	1.92	24.9	26.6	1.7
July	25.4	25.6	26.1	26.6	26.4	26.7	27.3	26.5	26.3	26.6	26.7	26.6	26.1	25.9	25.4	26.5	26.9	27.5	26.1	26.4	26.7	0.6	2.15	25.4	27.5	2.1
August	26.2	26.2	26.5	26.7	26.8	27.0	27.7	27.0	26.8	27.0	26.8	26.8	26.3	26.1	25.9	26.9	27.3	27.9	26.4	26.8	27.0	0.5	1.97	25.9	27.9	2.0
September	26.2	26.1	26.6	26.8	27.0	27.3	27.7	27.2	27.1	26.9	26.8	26.9	26.3	26.2	25.9	27.1	27.9	27.9	26.4	26.9	27.2	0.6	2.19	25.9	27.9	2.0
October	25.8	25.7	26.2	26.1	26.5	27.1	26.9	26.4	26.6	26.3	26.3	26.8	26.4	26.0	26.1	26.5	27.6	26.4	26.1	26.4	26.6	0.5	1.73	25.7	27.6	1.8
November	25.1	24.8	25.2	25.2	25.5	25.8	26.0	25.6	26.1	25.5	25.4	25.5	25.5	24.9	25.2	25.4	25.7	26.2	25.2	25.5	25.7	0.4	1.51	24.8	26.2	1.4
December	24.0	24.0	24.8	24.6	24.5	24.5	24.7	24.6	24.7	24.4	24.7	24.1	24.6	24.0	24.5	24.8	24.0	25.1	24.2	24.5	24.7	0.3	1.35	24.0	25.1	1.1
Annual Mean	24.6	24.7	25.0	25.2	25.2	25.5	25.7	25.3	25.2	25.4	25.4	25.0	24.9	25.0	24.8	25.1	25.4	25.5	25.0	25.2	25.4	0.3		24.6	25.7	1.1

Table 20
 Monthly averaged dry-bulb temperature (°C) across O’ahu for years 1998–2015 with annual means and interannual statistics of monthly values.

Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Q1	Mean	Q3	Sdev	COV (%)	Min	Max	Range
January	24.1	23.5	22.8	24.9	23.9	23.9	24.3	24.4	24.3	24.5	23.5	23.7	24.4	24.2	24.6	23.6	24.1	24.1	23.8	24.0	24.4	0.5	2.03	22.8	24.9	2.1
February	23.7	23.5	24.2	24.0	23.0	23.6	25.0	23.8	23.2	23.6	24.3	22.9	23.7	24.8	24.0	23.1	24.5	24.6	23.5	23.9	24.2	0.6	2.62	22.9	25.0	2.2
March	24.9	23.6	24.1	24.2	23.7	25.2	23.9	23.8	24.0	24.8	25.1	22.9	23.7	24.5	23.5	23.5	24.2	23.8	23.7	24.1	24.4	0.6	2.55	22.9	25.2	2.3
April	23.6	24.2	23.4	24.3	25.7	25.1	24.8	24.9	23.8	24.9	24.8	23.6	24.1	25.7	24.5	25.3	24.6	25.4	24.1	24.6	25.0	0.7	2.90	23.4	25.7	2.3
May	23.9	25.4	25.3	25.5	26.0	26.2	26.1	26.4	24.7	26.2	26.0	26.4	25.8	25.5	25.2	26.2	26.6	25.4	25.4	25.7	26.2	0.7	2.62	23.9	26.6	2.7
June	25.2	25.6	26.3	25.6	26.8	27.2	26.6	26.6	26.7	26.8	26.5	26.9	26.3	25.6	25.6	26.3	26.6	27.0	25.8	26.4	26.8	0.6	2.21	25.2	27.2	2.0
July	25.9	25.8	26.4	26.9	26.7	27.1	27.8	27.0	26.9	26.9	27.1	27.0	26.6	26.3	26.0	27.0	27.3	28.2	26.4	26.8	27.1	0.6	2.30	25.8	28.2	2.4
August	26.7	26.5	26.8	27.1	27.2	27.4	28.1	27.7	27.3	27.4	27.0	27.2	26.7	26.7	26.5	27.4	27.8	28.6	26.7	27.2	27.4	0.6	2.08	26.5	28.6	2.0
September	26.5	26.3	26.9	27.1	27.5	28.0	28.0	27.4	27.3	27.1	27.2	27.4	26.9	27.0	26.4	27.5	28.5	28.4	26.9	27.3	27.5	0.6	2.30	26.3	28.5	2.2
October	26.1	26.0	26.3	26.4	26.7	27.8	27.2	26.5	27.1	26.6	26.7	27.7	26.8	26.5	26.8	27.1	27.7	27.2	26.5	26.8	27.2	0.5	1.99	26.0	27.8	1.8
November	25.2	24.6	25.2	25.7	25.9	25.9	26.3	25.9	26.4	25.7	25.7	25.6	25.7	24.9	25.5	25.9	26.0	26.6	25.5	25.7	25.9	0.5	1.97	24.6	26.6	2.0
December	24.0	23.9	25.2	24.7	25.0	24.7	24.9	25.2	24.9	24.5	24.6	24.8	24.9	24.0	24.7	25.3	24.4	25.6	24.5	24.7	25.0	0.5	1.86	23.9	25.6	1.7
Annual Mean	25.0	24.9	25.2	25.5	25.7	26.0	26.1	25.8	25.6	25.8	25.7	25.5	25.5	25.5	25.3	25.7	26.0	26.2	25.5	25.6	25.8	0.4	1.42	24.9	26.2	1.3

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Transparency data associated with this article can be found in the online version at <https://doi.org/10.1016/j.dib.2018.05.099>.

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