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Sea Ice Conditions and Meteorological Observations at Saroma- ko Lagoon, Hokkaido, December 1995 - November 1996*,**

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(Received February 1997)

Abstract : Long-term ice conditions and meteorological data have been collected to characterize the general meteorological and climatological features at Saroma-ko Lagoon. A number of atmospheric boundary layer variables such as air temperature, wind azimuth and speed, and solar radiation were obtained at a permanently installed 5-m tower at a cape of Saroma-ko Lagoon during the period from January 1992 through November 1996. Ice condition data such as freeze-up, breakup and duration of complete ice coverage, and water temperature data have been collected since 1964 and 1987, respectively.

要旨：サロマ湖は毎年冬期間結氷する。このサロマ湖のキムアネップ岬に設置された5mの気象塔で通年の気象観測が行なわれている。本研究では，このサロマ湖の1992年1月からの気象観測の結果と1987年6月からの水温の観測結果を，また1964年から観測されている湖面の結氷状況について報告する。

Key words : Meteorological parameters, Sea ice, Saroma-ko Lagoon
キーワード：気象要素，海氷，サロマ湖

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I. Introduction

Saroma-ko Lagoon located on the Okhotsk Sea coast of Hokkaido is 149.2 km^2 in area, 19.5 m in maximum depth and 14.5 m in mean depth (Fig. 1). The lagoon has two inlets which are connected to the Sea of Okhotsk. About 90 % of the total inflow from the sea to the lagoon passes through the first inlet opened in 1927. The remainder passes through the second inlet which was built in December, 1978. The opening of the inlets might have caused changes in the water mass and current circulation of the lagoon, and in the exchange processes of the water between sea and lagoon waters. Also, freshwater input which is mainly supplied by two major rivers causes a reduction of salinity to less than 32 ppt (parts per thousand). During winter most of the lagoon surface is covered with sea ice. The Saroma Research Center of Aquaculture (SRCA) in Sakaeura has been monitoring ice conditions at the lagoon for over thirty years. It was shown from year-to-year changes in the duration of complete ice coverage in the lagoon that the trend of variations appeared to have decreased for the past ten years (Shirasawa et al., 1993). The SRCA has been also operating a 5-m meteorological tower at the cape of Kimuane-ppu (Fig. 1) in cooperation with the Sea Ice Research Laboratory of Hokkaido University to characterize the general meteorological and climatological features at the lagoon. Besides, the SRCA has been collecting water temperature data obtained from the water temperature station near the central area of the lagoon (Fig. 1). In this report, long-term ice condition data such as freeze-up, breakup and duration of complete ice coverage collected since 1964 are shown. Time series of water temperature and meteorological parameters collected since 1987 and 1992, respectively are also shown. Time series data of meteorological parameters were reported for the period from December 1991 through December 1992 by Shirasawa et al. (1993) and for January 1993 through November 1995 by Shirasawa et al. (1995).

II. Sea Ice Conditions at Saroma-ko Lagoon

It is shown from year-to-year changes in the duration of complete ice coverage in the lagoon that the trend of variations appeared to have decreased since 1979, corresponding to the opening of the second inlet (Table 1 and Fig. 2). The duration has been drastically decreased since 1988, and no complete ice coverage was found in 1989, 1991 and 1993. It is apparent that the freeze-up day of complete ice coverage has been getting late from mid-December in the sixties to late January/early February in the nineties. The initiation of sea ice formation in the lagoon and coastal sea ice areas is considered depending on cooling processes after the air temperature becomes lower than the surface water temperature. This happens sometime late

August or early September and continues till the ice breakup comes at early or mid-April (Table 2 and Fig. 3). There is a time lag between the freeze-up day of complete ice coverage and the freezing temperature of the lagoon water. In general, at the beginning of freeze-up of the lagoon, frazil ice is formed at the surface and destroyed mainly caused by atmospheric forcing. This phenomenon repeats for some period before ice becomes more stable and the lagoon surface is completely covered with a level ice sheet.

III. Meteorological Data at Kimuaneppu

A location map of the meteorological tower at Kimuaneppu (44° 06.08′ N 143° 56.12′ E) is shown in Fig. 1. A thermometer, a pyrheliometer and a wind sensor were installed at the heights of 2.9, 4.2 and 5.0 m, respectively, of the 5-m meteorological tower set up at the cape of Kimuaneppu in 1989. Instantaneous values of those sensors were recorded at every 10 min. and stored in a data acquisition system (Intelligent Data-Stocker DS-64 K 2 and LM-30 K, Kona Sapporo Co.). The threshold value for the wind speed was 2 m s^{-1}. The daily values of air temperature, wind speed and azimuth, and solar radiation together with water temperature values during the period from January 1992 through November 1996 are shown in Fig. 3. The values of daily mean water temperature obtained at the station (44° 07.77′ N 143° 52.17′ E) since June 1987 are listed in Table 2. Time series of wind speed and azimuth, air temperature and solar radiation during the period from December 1995 through November 1996 at each month are shown in Fig. 4 and Table 3. Values for those graphs were obtained at a sampling interval of 10 min. except for stick diagrams of wind vector on the uppermost frame in the figure, which were produced by the data at a sampling interval of one hour. A time series of windrose at each month is shown in Fig. 5. The minimum air temperature during the sampling period from December 1995 through November 1996 was recorded at −23.0 ℃ in February 1996, and the maximum temperature was 29.2 ℃ in July 1996. The maximum wind was northwesterly at 22.3 m s^{-1} in January 1996. It appears that stronger northwesterly winds were predominant during the winter while the winds were milder during the summer.

Acknowledgements

We wish to thank the Saroma Research Center of Aquaculture in Sakaeura for their kind offers to use their facilities. Funding for this work was partly obtained from the Japanese Ministry of Education, Science and Culture (Monbusho) through grants-in-aid for Scientific Research "Measurements of Energy Flux and Biological Material through/under Sea Ice Cover

for Modeling of Sea-Ice Ecosystem" (No. 05680440, Principal Investigator : Kunio Shirasawa) and "An Experimental Study for Modeling of Air-Sea-Ice-Ecosystem in Seasonal Sea-Ice Evolution" (No. 07458117, Principal Investigator : Kunio Shirasawa), and from the Sasakawa Scientific Research Grant from the Japan Science Society (Principal Investigator : Tohru Takatsuka).

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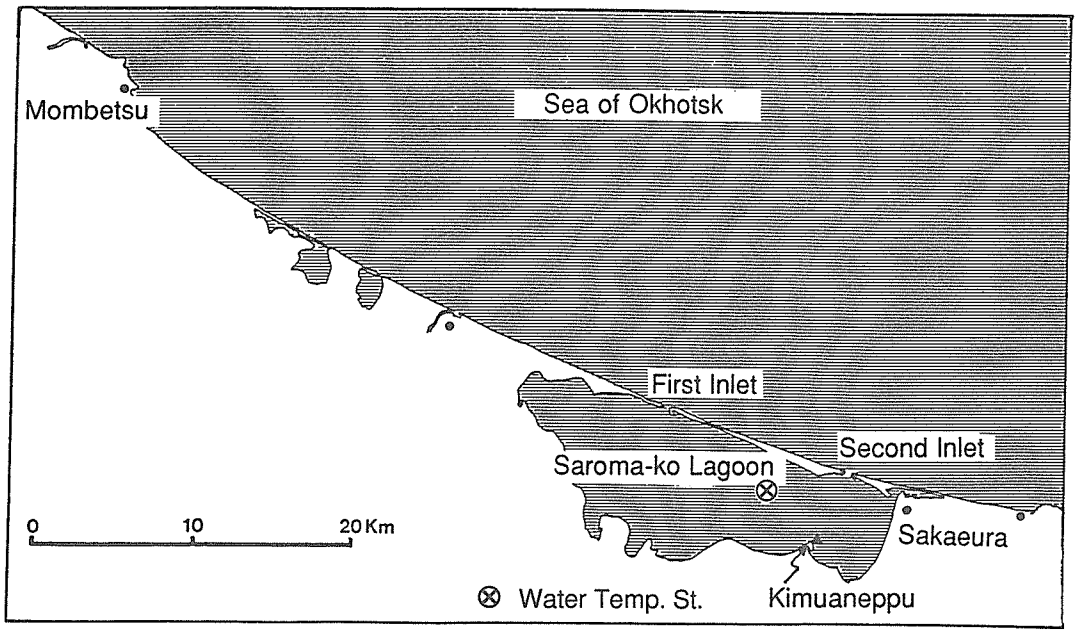


Fig. 1. A location map of Saroma-ko Lagoon.

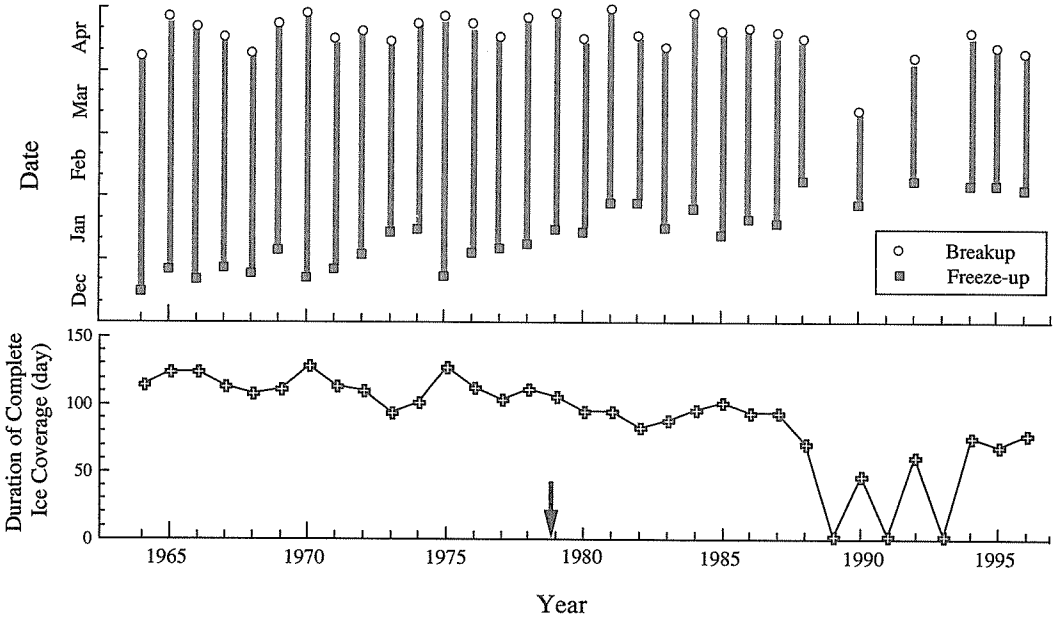


Fig. 2. Freeze-up, breakup and duration of complete ice coverage at Saroma-ko Lagoon during the period between 1964 and 1996. The arrow indicates the date of the opening of the second inlet in December 1978.

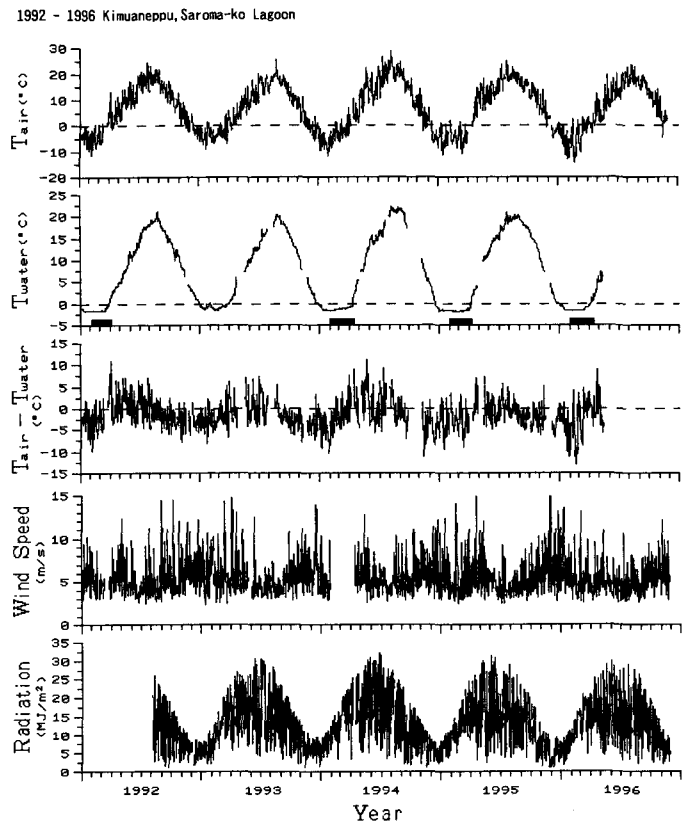


Fig. 3. Air and water temperatures, the difference between air and water temperatures, wind speed and solar radiation obtained at Kimuaneppu and the water temperature station during the period between January 1992 and November 1996. The bar in the frame of the water temperature indicates the duration of complete ice coverage at the lagoon.

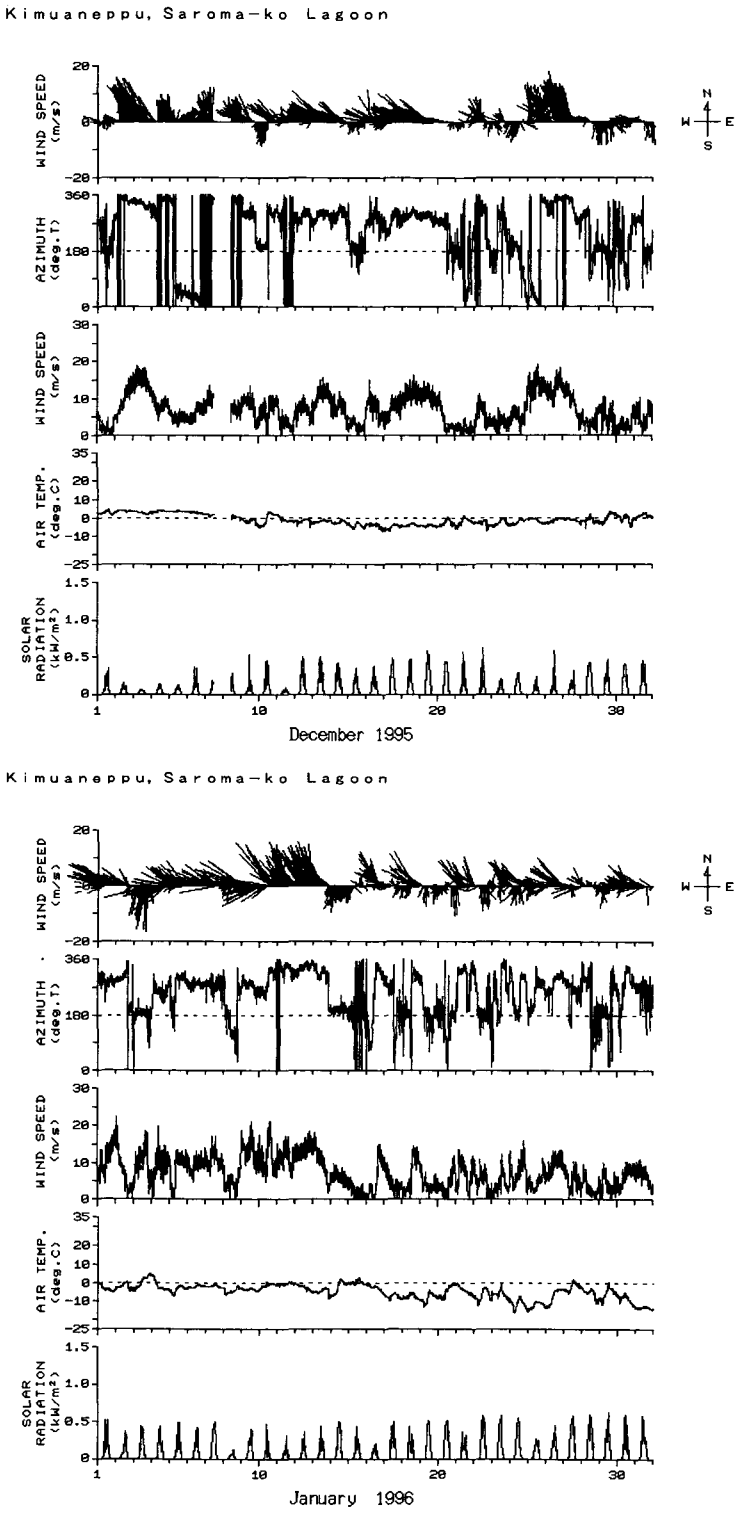
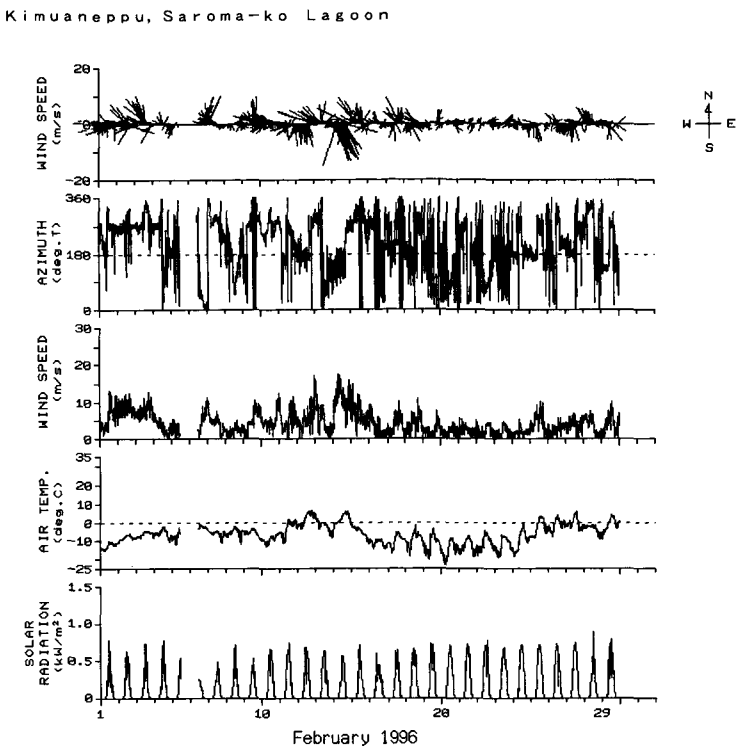
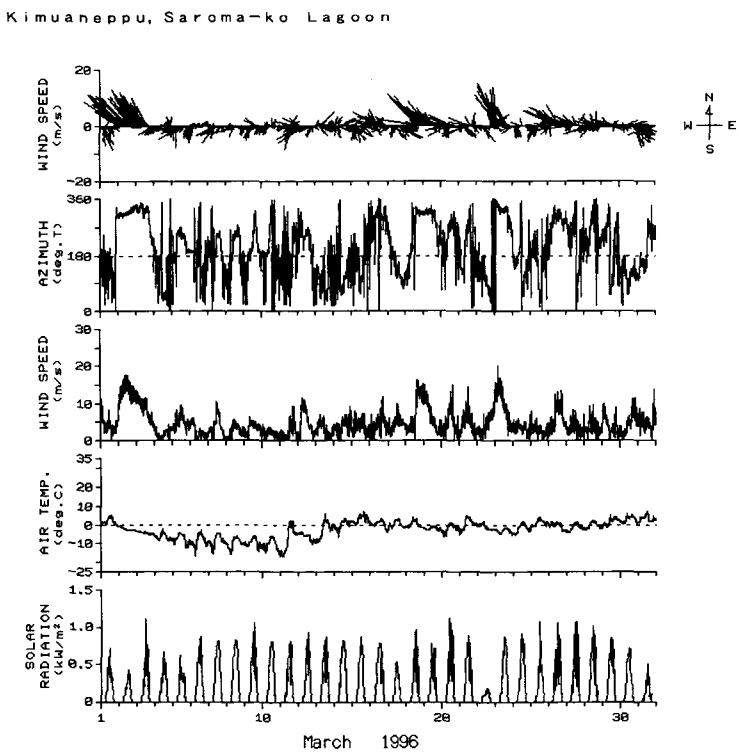
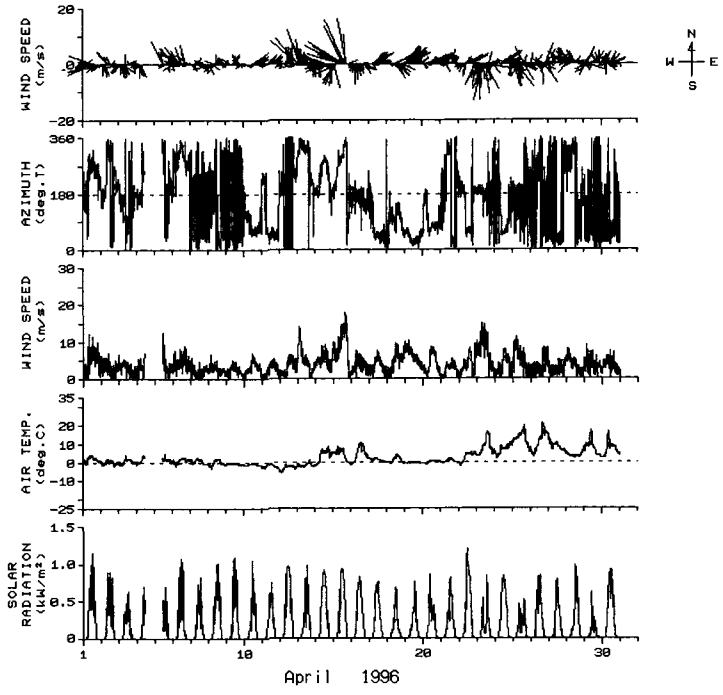


Fig. 4. Wind speed and azimuth, air temperature and solar radiation obtained at Kimuaneppu during the period between December 1995 and November 1996.

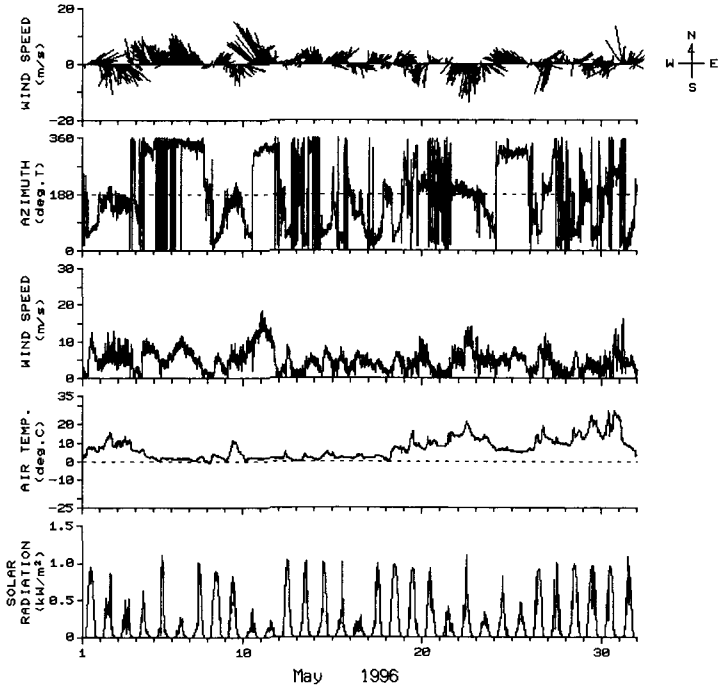

Kimuaneppu, Saroma-ko Lagoon
WIND SPEED (m/s)
AZIMUTH (deg.T)
WIND SPEED (m/s)
AIR TEMP. (deg.C)
SOLAR RADIATION (kW/m²)
N
W
E
S
1
10
20
29
February 1996


Kimuaneppu, Saroma-ko Lagoon
WIND SPEED (m/s)
AZIMUTH (deg.T)
WIND SPEED (m/s)
AIR TEMP. (deg.C)
SOLAR RADIATION (kW/m²)
N
W
E
S
1
10
20
30
March 1996

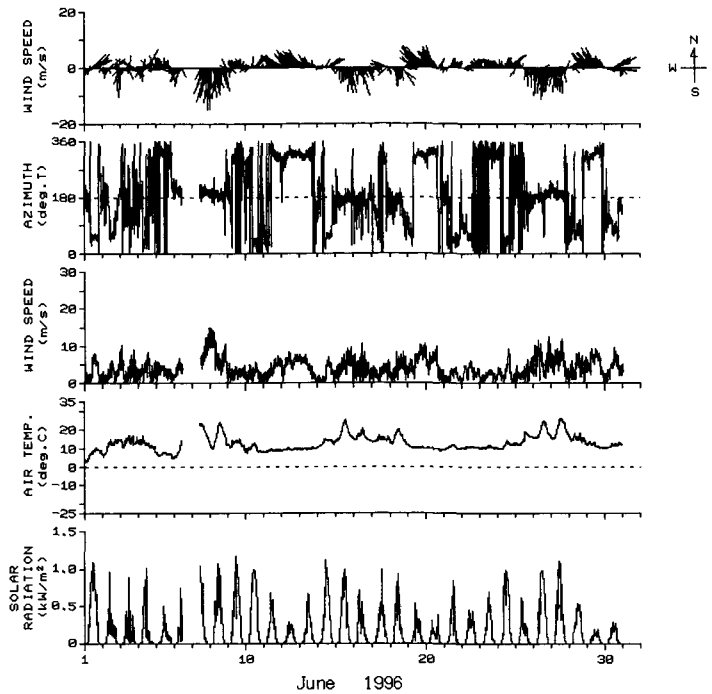
Kimuaneppu, Saroma-ko Lagoon



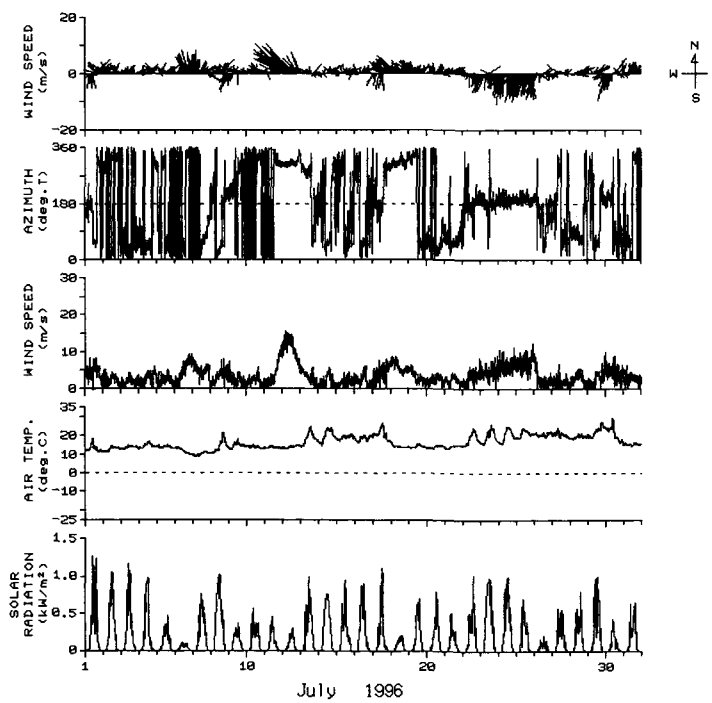
Kimuaneppu, Saroma-ko Lagoon



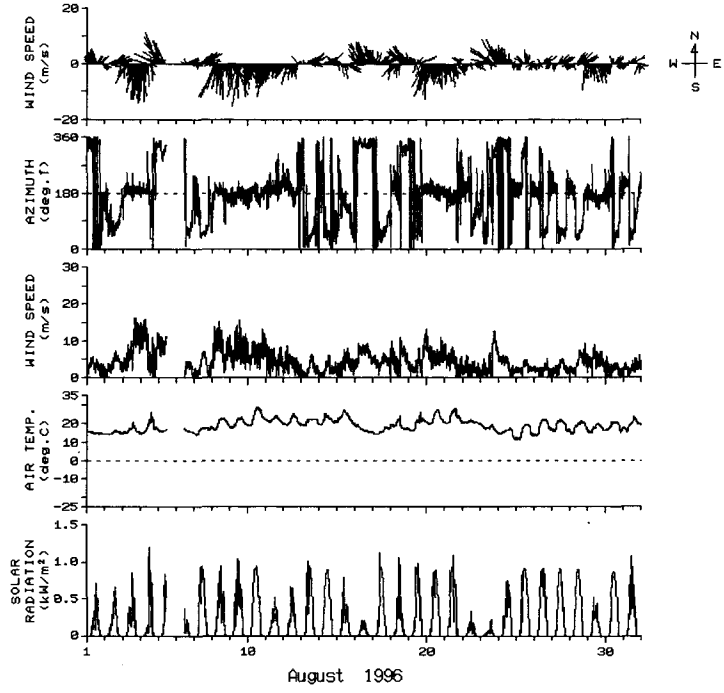
Kimuaneppu, Saroma-ko Lagoon



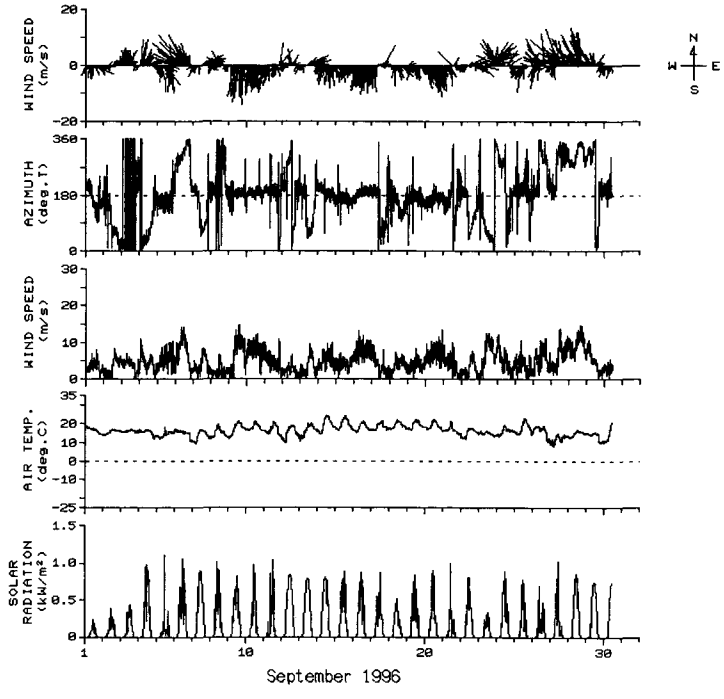
Kimuaneppu, Saroma-ko Lagoon



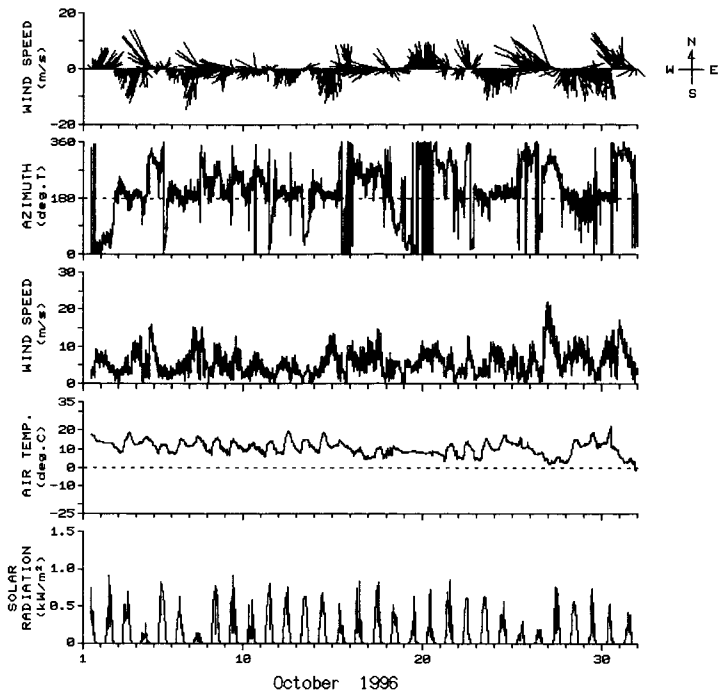
Kimuaneppu, Saroma-ko Lagoon



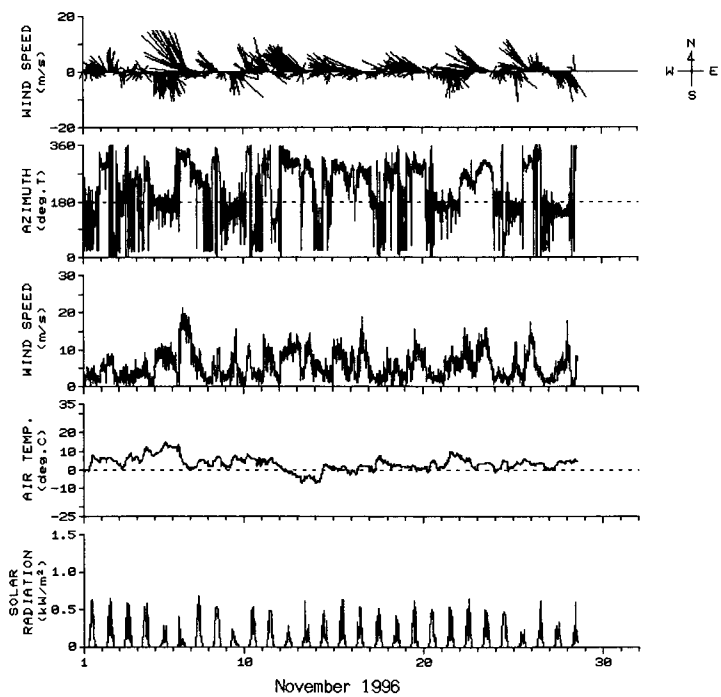
Kimuaneppu, Saroma-ko Lagoon



Kimuaneppu, Saroma-ko Lagoon



Kimuaneppu, Saroma-ko Lagoon



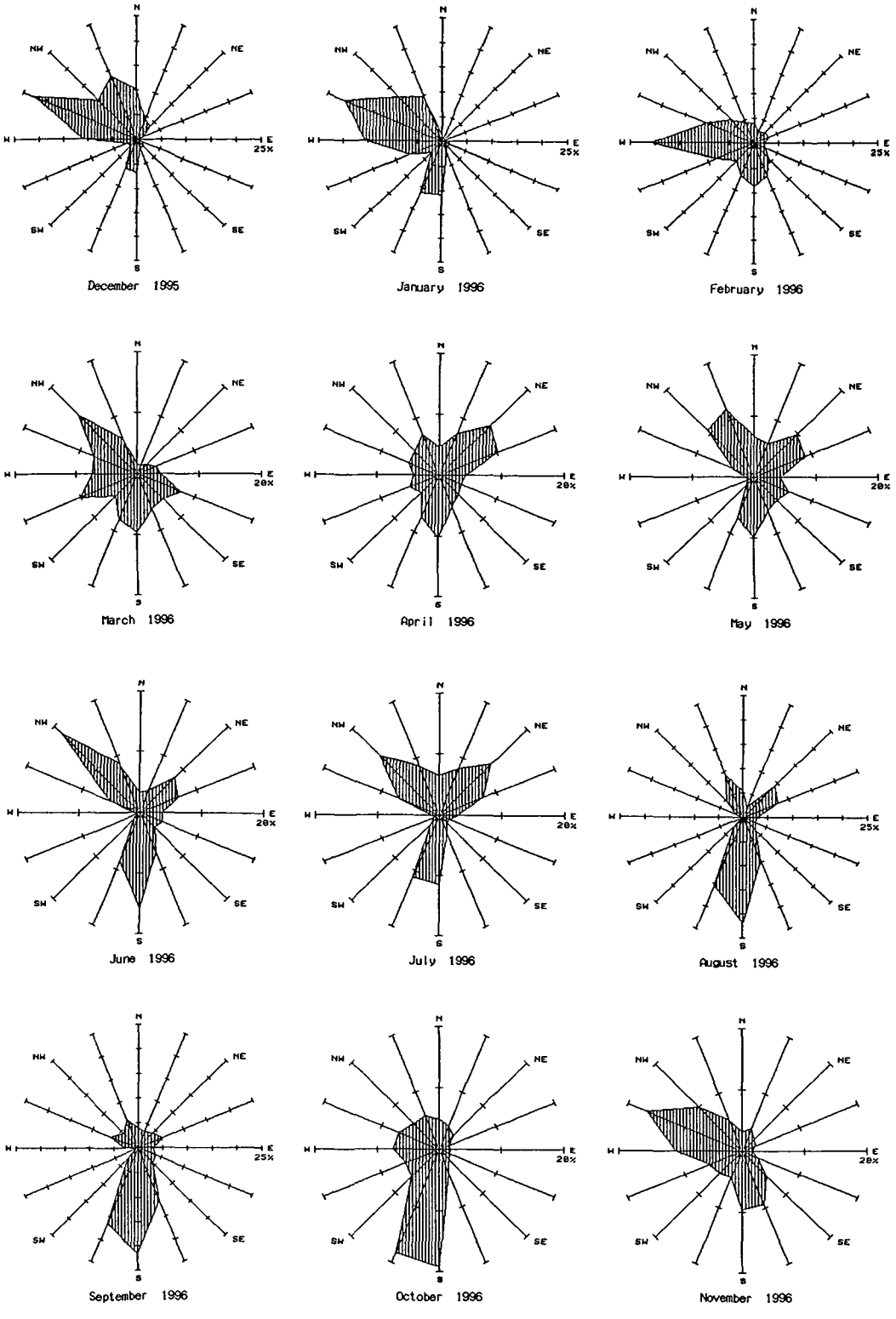


Fig. 5. Windroses for each month during the period between December 1995 and November 1996 at Kimuaneppu.

Table 1. Freeze-up, breakup and duration of complete ice coverage at Saroma-ko Lagoon during the period between 1964 and 1996.

Year	Date of freeze-up	Date of breakup	Duration of complete ice coverage (day)
1963-64	15 Dec. 1963	05 Apr. 1964	112
1964-65	25 Dec. 1964	25 Apr. 1965	121
1965-66	20 Dec. 1965	20 Apr. 1966	121
1966-67	26 Dec. 1966	15 Apr. 1967	110
1967-68	23 Dec. 1967	06 Apr. 1968	105
1968-69	03 Jan. 1969	21 Apr. 1969	108
1969-70	21 Dec. 1969	26 Apr. 1970	126
1970-71	25 Dec. 1970	14 Apr. 1971	110
1971-72	01 Jan. 1972	17 Apr. 1972	107
1972-73	12 Jan. 1973	13 Apr. 1973	91
1973-74	13 Jan.1974	21 Apr. 1974	98
1974-75	22 Dec. 1974	25 Apr. 1975	124
1975-76	02 Jan. 1976	20 Apr. 1976	109
1976-77	04 Jan. 1977	15 Apr. 1977	101
1977-78	06 Jan. 1978	24 Apr. 1978	108
1978-79	13 Jan. 1979	26 Apr. 1979	103
1979-80	12 Jan. 1980	13 Apr. 1980	92
1980-81	26 Jan. 1981	28 Apr. 1981	92
1981-82	26 Jan. 1982	16 Apr. 1982	80
1982-83	14 Jan. 1983	10 Apr. 1983	86
1983-84	23 Jan. 1984	25 Apr. 1984	93
1984-85	10 Jan. 1985	18 Apr. 1985	98
1985-86	18 Jan. 1986	19 Apr. 1986	91
1986-87	16 Jan.1987	17 Apr. 1987	91
1987-88	05 Feb. 1988	13 Apr. 1988	68
1988-89	-	-	0
1989-90	25 Jan. 1990	11 Mar. 1990	45
1990-91	-	-	0
1991-92	05 Feb. 1992	04 Apr. 1992	59
1992-93	-	-	0
1993-94	03 Feb. 1994	17 Apr. 1994	73
1994-95	03 Feb. 1995	10 Apr. 1995	66
1995-96	01 Feb. 1996	16 Apr. 1996	75

Table 2. Daily values of water temperature obtained at the water temperature station (44° 07.77′ N 143′ 52.17′ E) during the period between June 1987 and May 1996.

1987

Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.	
Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)
1		1		1		1		1		1		1	14.0	1	17.1	1	18.9	1	16.9	1	11.2	1	2.5
2		2		2		2		2		2		2	14.4	2	17.1	2	18.9	2	16.8	2	11.1	2	2.4
3		3		3		3		3		3		3	14.4	3	16.9	3	18.9	3	16.7	3	10.9	3	1.9
4		4		4		4		4		4		4	15.0	4	17.3	4	19.0	4	16.6	4	10.7	4	1.8
5		5		5		5		5		5		5	15.1	5	17.7	5	19.1	5	16.6	5	10.5	5	1.6
6		6		6		6		6		6	11.5	6	15.0	6	17.7	6	19.3	6	16.7	6	10.2	6	1.4
7		7		7		7		7		7	11.4	7	14.7	7	17.5	7	19.6	7	16.9	7	9.9	7	1.2
8		8		8		8		8		8	12.9	8	14.4	8	17.7	8	19.8	8	16.8	8	9.6	8	1.1
9		9		9		9		9		9	12.7	9	14.7	9	17.8	9	19.8	9	16.5	9	9.3	9	0.8
10		10		10		10		10		10	11.8	10	15.0	10	18.0	10	19.6	10	16.2	10	9.0	10	0.7
11		11		11		11		11		11	13.0	11	15.2	11	18.0	11	19.5	11	16.1	11	9.1	11	0.8
12		12		12		12		12		12	12.3	12	15.4	12	18.5	12	19.5	12	15.8	12	9.0	12	1.0
13		13		13		13		13		13	11.0	13	15.3	13	18.3	13	19.6	13	15.4	13	9.0	13	0.9
14		14		14		14		14		14	11.7	14	15.9	14	18.3	14	19.7	14	15.2	14	8.7	14	0.7
15		15		15		15		15		15	11.9	15	16.0	15	18.6	15	19.4	15	14.8	15	8.7	15	0.4
16		16		16		16		16		16	11.8	16	15.8	16	19.3	16	19.2	16	14.7	16	8.4	16	0.3
17		17		17		17		17		17	11.9	17	15.5	17	19.0	17	19.1	17	14.6	17	8.2	17	0.0
18		18		18		18		18		18	11.9	18	15.3	18	19.1	18	18.7	18	14.4	18	7.9	18	-0.2
19		19		19		19		19		19	12.1	19	15.8	19	19.4	19	18.0	19	14.2	19	7.6	19	-0.5
20		20		20		20		20		20	12.2	20	16.6	20	19.2	20	17.7	20	14.0	20	6.8	20	-0.6
21		21		21		21		21		21	12.9	21	16.7	21	19.1	21	17.5	21	13.5	21	6.6	21	-0.6
22		22		22		22		22		22	13.8	22	16.6	22	18.7	22	17.5	22	13.1	22	6.2	22	-0.9
23		23		23		23		23		23	14.5	23	16.2	23	18.7	23	17.5	23	13.0	23	5.9	23	-1.0
24		24		24		24		24		24	14.6	24	16.4	24	18.4	24	17.7	24	12.7	24	5.6	24	-1.1
25		25		25		25		25		25	14.0	25	16.7	25	18.4	25	17.5	25	12.3	25	4.8	25	-1.3
26		26		26		26		26		26	14.5	26	16.8	26	18.5	26	17.4	26	12.2	26	4.6	26	-1.2
27		27		27		27		27		27	13.8	27	16.9	27	18.7	27	17.3	27	12.3	27	4.5	27	-1.3
28		28		28		28		28		28	14.1	28	16.9	28	18.7	28	17.2	28	12.2	28	3.9	28	-1.2
29				29		29		29		29	13.4	29	17.6	29	18.6	29	17.0	29	12.1	29	3.5	29	-1.1
30				30		30		30		30	13.7	30	18.0	30	18.6	30	16.9	30	11.8	30	2.7	30	-0.9
31				31				31				31	17.5	31	18.6			31	11.5			31	-1.2

1988

Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.	
Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)
1	-1.1	1	-1.6	1	-1.7	1	-0.8	1	5.6	1	9.4	1	15.0	1	17.3	1	19.8	1		1	9.8	1	3.4
2	-1.4	2	-1.6	2	-1.7	2	-0.8	2	5.6	2	8.9	2	16.6	2	17.5	2	19.4	2		2	9.6	2	3.4
3	-1.6	3	-1.6	3	-1.7	3	-1.4	3	5.6	3	8.6	3	16.9	3	16.9	3	19.1	3		3	9.2	3	3.4
4	-1.6	4	-1.6	4	-1.5	4	-1.0	4	6.4	4	8.2	4	16.9	4	16.2	4	19.1	4		4	8.9	4	3.2
5	-1.6	5	-1.6	5	-1.6	5	-0.6	5	6.6	5	8.3	5	16.9	5	16.1	5	19.1	5		5	8.8	5	3.3
6	-1.6	6	-1.6	6	-1.6	6	-0.8	6	6.7	6	9.3	6	17.0	6	16.9	6	18.9	6		6	8.6	6	3.3
7	-1.6	7	-1.6	7	-1.5	7	0.1	7	6.8	7	9.0	7	17.4	7	17.2	7	18.9	7		7	8.4	7	3.1
8	-1.6	8	-1.6	8	-1.5	8	0.2	8	6.8	8	8.8	8	16.5	8	16.8	8	19.1	8		8	7.9	8	3.2
9	-1.6	9	-1.6	9	-1.5	9	0.3	9	6.9	9	8.7	9	15.7	9	17.5	9	18.7	9		9	7.8	9	3.2
10	-1.7	10	-1.6	10	-1.5	10	0.3	10	7.0	10	9.0	10	14.9	10	17.9	10	18.5	10		10	7.6	10	3.2
11	-1.7	11	-1.6	11	-1.6	11	0.7	11	7.6	11	9.2	11	14.5	11	18.2	11	18.8	11		11	7.2	11	3.0
12	-1.7	12	-1.6	12	-1.6	12	1.7	12	8.3	12	9.3	12	14.6	12	18.8	12	18.5	12		12	6.4	12	2.8
13	-1.7	13	-1.6	13	-1.6	13	1.7	13	7.6	13	9.7	13	15.1	13	18.3	13	17.9	13		13	6.1	13	2.8
14	-1.7	14	-1.7	14	-1.6	14	1.9	14	6.8	14	10.5	14	15.5	14	18.2	14	17.9	14		14	5.8	14	2.8
15	-1.7	15	-1.7	15	-1.6	15	2.7	15	6.8	15	10.9	15	15.1	15	18.3	15	18.2	15		15	5.7	15	2.8
16	-1.7	16	-1.7	16	-1.7	16	2.8	16	6.9	16	11.4	16	15.7	16	18.5	16	17.9	16		16	5.4	16	2.6
17	-1.7	17	-1.7	17	-1.7	17	3.3	17	7.1	17	10.7	17	16.3	17	18.7	17	17.5	17		17	5.1	17	2.5
18	-1.7	18	-1.7	18	-1.7	18	3.4	18	7.1	18	10.9	18	16.2	18	19.0	18	17.4	18	13.7	18	5.0	18	2.5
19	-1.6	19	-1.7	19	-1.7	19	3.6	19	7.2	19	10.5	19	16.5	19	19.9	19	17.5	19	13.3	19	4.8	19	2.4
20	-1.6	20	-1.7	20	-1.7	20	4.0	20	8.2	20	9.9	20	16.5	20	20.3	20		20	13.1	20	4.5	20	2.0
21	-1.6	21	-1.7	21	-1.7	21	4.3	21	9.8	21	10.4	21	16.7	21	20.8	21		21	12.9	21	4.5	21	1.7
22	-1.6	22	-1.7	22	-1.6	22	4.1	22	10.4	22	10.6	22	16.8	22	21.4	22		22	12.7	22	4.3	22	1.6
23	-1.6	23	-1.7	23	-1.6	23	4.1	23	9.6	23	10.6	23	16.6	23	21.7	23		23	12.5	23	4.1	23	1.2
24	-1.6	24	-1.7	24	-1.6	24	4.7	24	9.6	24	10.7	24	16.6	24	21.9	24		24	12.1	24	3.9	24	0.9
25	-1.5	25	-1.7	25	-1.6	25	5.1	25	9.6	25	10.8	25	16.3	25	22.1	25		25	11.7	25	4.1	25	0.7
26	-1.5	26	-1.7	26	-1.6	26	5.2	26	9.5	26	11.8	26	15.5	26	22.0	26		26	11.6	26	3.9	26	0.4
27	-1.5	27	-1.7	27	-1.6	27		27	9.7	27	12.6	27	15.1	27	21.4	27		27	11.5	27	3.9	27	0.1
28	-1.6	28	-1.7	28	-1.6	28	5.2	28	10.0	28	13.9	28	15.3	28	21.3	28		28	11.3	28	3.8	28	-0.2
29	-1.6	29	-1.7	29	-1.6	29	4.3	29	10.0	29	14.2	29	15.6	29	20.9	29		29	11.0	29	3.8	29	-0.3
30	-1.5			30	-1.4	30	4.5	30	10.8	30	14.2	30	16.3	30	20.5	30		30	10.5	30	3.8	30	-0.6
31	-1.6			31	-1.1			31	10.2			31	17.0	31	20.2			31	10.1			31	-0.7

1989

Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.	
Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)
1	-0.7	1	-1.4	1	-0.9	1	1.0	1		1	7.7	1	11.4	1	19.1	1	20.8	1	17.5	1	11.4	1	5.6
2	-0.7	2	-1.3	2	-0.9	2	1.1	2		2	7.5	2	11.2	2	19.4	2	20.8	2	17.4	2	11.2	2	5.4
3	-0.7	3	-1.4	3	-0.8	3	1.3	3		3	7.5	3	11.1	3	20.8	3	20.8	3	17.1	3	10.8	3	5.0
4	-0.8	4	-1.6	4	-0.8	4	1.5	4		4	7.9	4	11.0	4	20.9	4	20.0	4	16.9	4	10.6	4	4.8
5	-0.9	5	-1.6	5	-0.8	5	1.4	5		5	8.0	5	11.2	5	20.3	5	20.0	5	16.7	5	10.7	5	4.8
6	-1.0	6	-1.5	6	-0.7	6	1.4	6		6	7.9	6	11.1	6	19.9	6	20.0	6	16.5	6	10.5	6	4.5
7	-1.2	7	-1.5	7	-0.4	7	1.4	7		7	8.4	7	11.2	7	20.0	7	20.1	7	16.4	7	10.2	7	3.9
8	-1.2	8	-1.4	8	-0.2	8	1.3	8		8	9.2	8	11.4	8	20.2	8	20.2	8	16.3	8	10.0	8	3.6
9	-1.2	9	-1.4	9	0.1	9	1.2	9		9	8.7	9	11.7	9	21.0	9	20.2	9	16.1	9	9.7	9	3.7
10	-1.3	10	-1.4	10	0.0	10	1.4	10		10	9.2	10	11.9	10	21.1	10	20.2	10	15.9	10	9.6	10	3.6
11	-1.3	11	-1.4	11	-0.2	11	1.3	11		11	9.0	11	12.3	11	20.8	11	20.5	11	15.7	11	9.5	11	3.3
12	-1.3	12	-1.4	12	0.4	12	0.9	12		12	9.1	12	13.9	12	21.7	12	20.8	12	15.5	12	9.4	12	3.2
13	-1.4	13	-1.4	13	-0.1	13	0.9	13		13	9.5	13	13.6	13	22.2	13	20.6	13	15.5	13	9.2	13	2.9
14	-1.4	14	-1.4	14	0.1	14	0.9	14	6.7	14	9.6	14	14.1	14	22.5	14	20.6	14	15.5	14	8.9	14	2.9
15	-1.5	15	-1.4	15	0.1	15	0.9	15	5.5	15	9.4	15	13.9	15	22.2	15	20.5	15	15.4	15	8.8	15	2.7
16	-1.5	16	-1.4	16	0.3	16	1.1	16	5.8	16	9.4	16	13.6	16	22.2	16	20.2	16	15.3	16	8.4	16	2.6
17	-1.4	17	-1.3	17	0.2	17	1.4	17	6.1	17	9.7	17	13.4	17	21.5	17	19.9	17	15.3	17	8.2	17	2.1
18	-1.3	18	-1.3	18	0.0	18	2.3	18	6.3	18	10.2	18	13.7	18	20.5	18	19.6	18	15.2	18	7.9	18	2.1
19	-1.3	19	-1.2	19	-0.1	19	3.1	19	6.0	19	10.6	19	14.3	19	20.5	19	19.5	19	14.7	19	7.7	19	1.7
20	-1.2	20	-1.1	20	-0.1	20	3.2	20	5.6	20	10.8	20	14.6	20	20.3	20		20	14.2	20	7.4	20	1.4
21	-1.3	21	-1.2	21	0.0	21	3.3	21	5.8	21	10.8	21	14.7	21	20.4	21		21	14.0	21	7.4	21	0.6
22	-1.2	22	-1.2	22	0.0	22	3.9	22	5.3	22	10.7	22	14.8	22	20.7	22		22	13.6	22	7.3	22	0.2
23	-1.4	23	-1.2	23	0.0	23	3.2	23	6.0	23	10.3	23	14.9	23	20.7	23	18.5	23	13.5	23	7.2	23	0.3
24	-1.4	24	-1.3	24	0.0	24	4.0	24	6.1	24	10.3	24	15.2	24	20.8	24	18.4	24	13.3	24	6.9	24	0.3
25	-1.5	25	-1.2	25	0.2	25	3.6	25	5.9	25	10.5	25	15.4	25	21.1	25	18.4	25	13.2	25	6.5	25	0.3
26	-1.6	26	-1.1	26	0.1	26	3.6	26	5.6	26	11.0	26	16.3	26	21.0	26	18.2	26	13.2	26	6.3	26	0.1
27	-1.6	27	-1.0	27	0.1	27	3.5	27	6.0	27	11.3	27	18.0	27	21.1	27	18.1	27	13.0	27	6.0	27	-0.1
28	-1.6	28	-1.0	28	0.3	28	3.6	28	6.7	28	11.2	28	18.3	28	21.3	28	18.1	28	12.9	28	6.1	28	0.1
29	-1.4			29	0.4	29		29	7.0	29	11.2	29	18.8	29	21.0	29	17.8	29	12.7	29	6.0	29	0.1
30	-1.5			30	0.6	30		30	6.9	30	11.2	30	18.8	30	20.7	30	17.5	30	12.3	30	6.0	30	-0.1
31	-1.5			31	0.7			31	7.9			31	19.1	31	20.9			31	11.7			31	-0.1

1990

Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.	
Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)
1	-0.3	1	-1.6	1	-0.5	1	0.0	1	6.7	1	10.1	1	14.8	1	20.0	1	21.2	1	17.5	1	12.9	1	7.5
2	-0.4	2	-1.6	2	-0.4	2	0.0	2	6.5	2	10.2	2	15.3	2	20.3	2	21.4	2	17.3	2	12.8	2	7.6
3	-0.2	3	-1.6	3	-1.1	3	0.2	3	6.5	3	11.4	3	15.9	3	20.3	3	21.3	3	17.2	3	12.7	3	7.4
4	-0.2	4	-1.6	4	-1.0	4	0.3	4	6.7	4	11.3	4	16.6	4	20.3	4	21.3	4	16.9	4	12.5	4	7.3
5	-0.3	5	-1.6	5	-0.7	5	0.7	5	6.7	5	12.2	5	17.2	5	20.8	5	21.4	5	16.9	5	12.4	5	7.0
6	-0.5	6	-1.6	6	-0.5	6	0.9	6	6.8	6	12.7	6	17.2	6	20.5	6	21.1	6	17.1	6	12.3	6	7.3
7	-0.6	7	-1.6	7	-0.4	7	1.4	7	7.2	7	13.0	7	17.2	7	20.8	7	20.7	7	17.0	7	12.3	7	7.3
8	-0.4	8	-1.6	8	-0.3	8	1.3	8	8.0	8	13.3	8	17.3	8	21.4	8	20.5	8	16.8	8	12.0	8	7.6
9	-0.7	9	-1.6	9	-0.3	9	1.8	9	8.0	9	13.2	9	17.8	9	22.0	9	20.8	9	16.6	9	11.9	9	6.9
10	-0.6	10	-1.6	10	-0.9	10	1.9	10	8.5	10	13.3	10	18.3	10	21.6	10	21.0	10	16.2	10	11.4	10	7.0
11	-0.8	11	-1.6	11	-0.9	11	2.3	11	9.1	11	13.3	11	18.8	11	21.4	11	21.0	11	15.9	11	11.4	11	7.0
12	-1.2	12	-1.6	12	-0.6	12	2.1	12	9.1	12	13.2	12	19.0	12	21.8	12	21.1	12	15.8	12	10.7	12	6.5
13	-1.3	13	-1.6	13	-0.5	13	2.3	13	8.9	13	13.1	13	18.8	13	21.7	13	21.1	13	15.7	13	10.4	13	6.2
14	-1.5	14	-1.4	14	-0.1	14	2.8	14	9.0	14	12.7	14	18.4	14	21.7	14	20.9	14	15.7	14		14	5.9
15	-1.4	15	-1.4	15	0.1	15	3.3	15	8.4	15	13.4	15	18.6	15	21.5	15	20.9	15	15.6	15		15	5.8
16	-1.6	16	-1.4	16	0.1	16	3.5	16	7.9	16	13.5	16	18.9	16	21.3	16	20.7	16	15.7	16		16	5.5
17	-1.6	17	-1.4	17	-0.3	17	3.4	17	8.4	17	13.6	17	19.1	17	21.4	17	20.3	17	15.6	17		17	5.8
18	-1.6	18	-1.4	18	-0.3	18	3.6	18	9.5	18	12.3	18	19.5	18	21.4	18	20.1	18	15.5	18		18	5.1
19	-1.6	19	-1.4	19	0.0	19	3.6	19	9.9	19	12.8	19	19.8	19	21.7	19	20.0	19	15.4	19		19	4.9
20	-1.5	20	-1.5	20	0.3	20	3.9	20	9.8	20	13.8	20	20.1	20	21.8	20	19.6	20	15.3	20	8.5	20	4.5
21	-1.5	21	-1.5	21	-0.2	21	4.4	21	9.7	21	13.8	21	20.1	21	22.0	21	19.5	21	15.3	21	8.4	21	4.2
22	-1.6	22	-1.5	22	0.0	22	5.1	22	10.2	22	14.3	22	20.1	22	21.3	22	19.0	22	15.2	22	8.2	22	4.1
23	-1.6	23	-1.4	23	0.1	23	5.6	23	9.7	23	14.1	23	18.9	23	21.5	23	18.6	23	15.1	23	8.0	23	3.9
24	-1.6	24	-1.3	24	-0.7	24	5.8	24	9.3	24	14.4	24	19.0	24	21.9	24	18.3	24	15.0	24	7.5	24	3.8
25	-1.6	25	-1.2	25	-0.4	25		25	9.6	25	14.7	25	19.0	25	21.2	25	18.0	25	14.9	25	7.7	25	3.6
26	-1.6	26	-1.0	26	-0.4	26		26	9.8	26	15.4	26	19.2	26	20.8	26	17.8	26	14.8	26	7.6	26	3.5
27	-1.6	27	-0.8	27	-0.4	27		27	10.5	27	15.5	27	19.7	27	20.8	27	17.5	27	14.4	27	7.7	27	3.5
28	-1.6	28	-0.5	28	-0.4	28	7.3	28	10.2	28	15.2	28	19.5	28	20.8	28	17.6	28	14.1	28	7.6	28	3.3
29	-1.6			29	-0.3	29	7.1	29	10.2	29	14.8	29	19.8	29	21.0	29	17.4	29	13.5	29	7.3	29	3.1
30	-1.6			30	-0.2	30	7.1	30	10.1	30	14.6	30	19.8	30	21.1	30	17.4	30	13.3	30	7.5	30	3.0
31	-1.6			31	-0.2			31	10.0			31	19.9	31	21.3			31	13.2			31	2.6

1991

Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.	
Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)
1	2.1	1	-0.8	1	-1.6	1	0.9	1	6.8	1	13.4	1	15.5	1	17.7	1		1		1	11.9	1	4.7
2	1.8	2	-0.8	2	-1.6	2	1.1	2	6.9	2	13.4	2	15.7	2	18.1	2		2		2	11.7	2	4.6
3	1.8	3	-0.9	3	-1.7	3	1.4	3	6.7	3	13.7	3	16.3	3	18.3	3	20.1	3	16.0	3	11.5	3	4.6
4	1.5	4	-0.9	4	-1.7	4	1.6	4	6.8	4	14.3	4	16.5	4	18.4	4		4	16.0	4	11.5	4	4.4
5	0.8	5	-1.0	5	-1.7	5	1.7	5	7.1	5	14.6	5	17.0	5	18.2	5		5		5	10.9	5	4.2
6	0.7	6	-0.9	6	-1.7	6	1.9	6	7.4	6	14.7	6	16.1	6	18.2	6		6	16.2	6	10.2	6	4.0
7	0.7	7	-1.0	7	-1.6	7	1.7	7	7.9	7	15.1	7	15.7	7	18.6	7		7	15.9	7	10.3	7	3.8
8	0.9	8	-1.0	8	-1.5	8	2.2	8	7.8	8	15.0	8	16.0	8	18.8	8		8	15.9	8	10.0	8	3.2
9	0.8	9	-1.1	9	-1.3	9	2.2	9	8.5	9	15.5	9	16.0	9	19.0	9		9	15.9	9	9.7	9	2.8
10	0.6	10	-1.3	10	-1.2	10	2.8	10	9.3	10	15.1	10	16.5	10	19.3	10		10	15.8	10	9.5	10	2.5
11	0.6	11	-1.2	11	-1.3	11	3.5	11	9.7	11	15.4	11	16.6	11	19.4	11		11	15.6	11	9.5	11	2.2
12	0.6	12	-1.3	12	-1.2	12	4.0	12	10.2	12	14.6	12	16.7	12	19.4	12		12	15.6	12	9.8	12	2.2
13	0.6	13	-1.3	13	-1.1	13	4.4	13	10.4	13	14.1	13	16.6	13	19.6	13		13	15.6	13	9.4	13	1.8
14	0.6	14	-1.5	14	-1.1	14	4.1	14	10.4	14	14.1	14	17.1	14	19.9	14		14	15.5	14	9.0	14	1.3
15	0.5	15	-1.4	15	-1.1	15	4.6	15	10.3	15	13.9	15	17.6	15	20.2	15		15	15.1	15	8.5	15	1.2
16	0.5	16	-1.6	16	-1.1	16	4.5	16	10.0	16	14.7	16	17.7	16	20.5	16		16		16	7.9	16	1.2
17	0.4	17	-1.8	17	-1.1	17	4.9	17	9.4	17	15.2	17	17.5	17	19.7	17	18.8	17		17	7.8	17	1.1
18	0.5	18	-1.9	18	-1.2	18	5.1	18	9.3	18	15.9	18	17.4	18	20.4	18		18		18	7.7	18	0.9
19	0.4	19	-1.9	19	-1.1	19	4.9	19	9.4	19	16.0	19	17.5	19	20.7	19		19	14.5	19	7.6	19	0.7
20	0.4	20	-1.8	20	-1.2	20	4.8	20	9.9	20	16.1	20	17.4	20		20		20	14.4	20	7.4	20	0.5
21	0.3	21	-1.8	21	-1.3	21		21	10.4	21		21	17.1	21	21.4	21		21	14.2	21	6.9	21	0.3
22	0.2	22	-1.8	22	-1.1	22		22	10.7	22		22	17.2	22		22		22	14.0	22	6.3	22	0.4
23	0.0	23	-1.8	23	-1.1	23		23	11.2	23		23	17.4	23		23		23	13.8	23	6.7	23	0.2
24	0.0	24	-1.7	24	-1.1	24		24	11.1	24		24	17.6	24		24		24	13.5	24	6.2	24	0.1
25	-0.1	25	-1.7	25	-0.8	25		25	11.3	25	17.6	25	17.8	25		25		25	13.1	25	5.3	25	0.1
26	-0.2	26	-1.7	26	-0.4	26	6.7	26	11.6	26	17.9	26	18.3	26		26		26	13.0	26	5.0	26	0.0
27	-0.1	27	-1.7	27	-0.4	27	7.1	27	11.5	27	17.5	27	17.6	27		27		27	13.2	27	5.0	27	-0.2
28	-0.2	28	-1.7	28	-0.1	28	7.7	28	11.7	28	16.1	28	16.8	28		28	16.8	28	13.6	28	4.9	28	-0.5
29	-0.5			29	0.3	29	7.6	29	12.3	29	15.0	29	17.0	29		29	16.7	29	13.0	29	4.9	29	-0.5
30	-0.8			30	0.7	30	7.2	30	12.8	30	15.3	30	17.5	30		30		30	12.5	30	4.7	30	-0.8
31	-0.9			31	0.4			31	13.2			31	17.6	31				31	12.2			31	-0.8

1992

Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.	
Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)
1	-0.8	1	-1.7	1	-1.7	1	0.6	1	5.0	1	11.8	1	13.6	1	17.9	1	19.3	1	14.7	1	10.8	1	4.0
2	-1.0	2	-1.8	2	-1.7	2	0.5	2	4.9	2	12.2	2	14.5	2	18.1	2	19.5	2	14.9	2	10.2	2	3.8
3	-1.2	3	-1.8	3	-1.7	3	0.7	3	5.1	3	11.8	3	14.8	3	18.1	3	19.2	3	15.0	3	9.8	3	3.7
4	-1.3	4	-1.7	4	-1.8	4	2.1	4	5.2	4	10.9	4	14.5	4	17.9	4	18.6	4	15.0	4	9.6	4	3.5
5	-1.3	5	-1.7	5	-1.7	5	2.2	5	4.9	5	11.3	5	14.9	5	18.2	5	18.3	5	14.5	5	9.2	5	3.3
6	-1.3	6	-1.7	6	-1.4	6	1.9	6	4.7	6	11.1	6	16.4	6	18.7	6	18.0	6	14.4	6	9.5	6	3.0
7	-1.2	7	-1.7	7	-1.4	7	2.2	7	6.0	7	10.9	7	15.4	7	19.2	7	18.0	7	14.2	7	9.2	7	3.0
8	-1.4	8	-1.7	8	-1.5	8	2.6	8	5.5	8	10.2	8	15.1	8	19.4	8	17.9	8	14.1	8	8.7	8	3.1
9	-1.4	9	-1.8	9	-1.6	9	3.0	9	5.7	9	9.9	9	15.6	9	19.2	9	17.7	9	14.1	9	8.4	9	2.9
10	-1.5	10	-1.8	10	-1.7	10	3.0	10	5.8	10	10.2	10	16.1	10	18.5	10	17.5	10	13.9	10	8.2	10	2.9
11	-1.6	11	-1.8	11	-1.7	11	3.1	11	6.3	11	10.8	11	17.2	11	18.4	11	17.4	11	13.9	11	8.1	11	3.0
12	-1.6	12	-1.7	12	-1.6	12	2.7	12	6.7	12	11.3	12	17.1	12	19.2	12	17.0	12	13.9	12	8.0	12	2.7
13	-1.6	13	-1.8	13	-1.6	13	2.9	13	6.9	13	11.7	13	16.8	13	18.9	13	16.9	13	13.0	13	7.8	13	2.6
14	-1.7	14	-1.8	14	-1.6	14	3.1	14	6.9	14	12.2	14	17.0	14	18.8	14	16.9	14	12.4	14	7.7	14	2.4
15	-1.8	15	-1.8	15	-1.6	15	2.9	15	7.1	15	11.6	15	17.2	15	19.0	15	16.9	15	11.7	15	7.8	15	2.3
16	-1.8	16	-1.7	16	-1.6	16	3.1	16	7.6	16	11.5	16	17.3	16	19.0	16	16.8	16	11.8	16	7.8	16	2.1
17	-1.8	17	-1.7	17	-1.5	17	3.4	17	7.7	17	11.9	17	17.3	17	19.0	17	16.8	17	12.1	17	7.2	17	1.9
18	-1.8	18	-1.7	18	-1.2	18	3.7	18	7.2	18	11.9	18	17.7	18	18.9	18	16.9	18	11.6	18	6.7	18	1.7
19	-1.8	19	-1.6	19	-1.0	19	3.8	19	7.3	19	11.9	19	17.5	19	19.0	19	16.8	19	10.6	19	6.1	19	1.7
20	-1.8	20	-1.7	20	-1.1	20	4.0	20	7.5	20	12.4	20	17.3	20	19.0	20	16.4	20	9.9	20		20	1.4
21	-1.8	21	-1.7	21	-0.9	21	4.0	21	7.7	21	12.5	21	17.6	21	19.3	21	16.0	21	11.5	21		21	1.0
22	-1.8	22	-1.7	22	-0.8	22	4.1	22	8.0	22	12.0	22	17.6	22	19.3	22	15.5	22	12.5	22		22	0.9
23	-1.8	23	-1.7	23	-0.7	23	4.0	23	8.1	23	12.9	23	17.2	23	19.3	23	15.1	23	12.4	23		23	1.1
24	-1.8	24	-1.8	24	-0.5	24	4.1	24	8.0	24	13.4	24	17.3	24	20.0	24	15.5	24	12.4	24		24	0.9
25	-1.7	25	-1.8	25	-0.3	25	4.0	25	8.5	25	12.9	25	17.6	25	20.3	25	15.6	25	12.4	25		25	0.9
26	-1.7	26	-1.8	26	-0.4	26	4.1	26	8.8	26	14.0	26	17.8	26	20.7	26	15.6	26	11.9	26		26	1.0
27	-1.7	27	-1.8	27	-0.3	27	4.5	27	8.8	27	13.8	27	17.8	27	20.8	27	15.3	27	11.4	27		27	0.8
28	-1.7	28	-1.7	28	0.0	28	4.8	28	9.5	28	12.9	28	17.7	28	21.2	28	15.1	28	11.1	28	4.4	28	0.7
29	-1.7	29	-1.7	29	0.2	29	4.8	29	9.8	29	13.1	29	17.9	29	19.0	29	14.2	29	11.3	29	4.4	29	0.7
30	-1.7			30	0.3	30	4.8	30	10.8	30	13.1	30	18.2	30	18.9	30	14.4	30	11.2	30	4.1	30	0.4
31	-1.6			31	0.5			31	11.5			31	18.3	31	19.3			31	11.1			31	0.2

1993

Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.	
Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)
1	0.0	1	0.2	1	-1.3	1	-0.1	1	4.6	1	9.9	1	12.7	1		1	19.9	1	16.3	1	11.0	1	4.3
2	-0.2	2	0.1	2	-1.2	2	0.0	2		2	10.2	2	12.8	2		2	19.7	2	16.1	2	10.7	2	4.1
3	-0.2	3	0.0	3	-1.1	3	0.3	3		3	9.9	3	12.8	3	17.4	3	19.9	3	15.9	3	10.5	3	4.0
4	-0.5	4	-0.3	4	-1.1	4	0.8	4		4	9.8	4	12.6	4		4	20.1	4	15.9	4	10.3	4	3.7
5	-0.5	5	-0.6	5	-1.0	5	0.6	5		5	9.5	5	13.0	5		5	19.8	5	15.7	5	10.0	5	3.6
6	-0.6	6	-0.6	6	-1.1	6	0.5	6	3.9	6	9.7	6	13.4	6		6	19.5	6	15.3	6	9.2	6	3.4
7	-0.8	7	-0.8	7	-1.0	7	0.7	7		7	10.0	7	14.0	7		7	19.4	7	15.2	7	9.0	7	3.2
8	-1.0	8	-0.9	8	-1.0	8	1.0	8		8	10.4	8	14.4	8		8	19.0	8	15.2	8	8.0	8	2.9
9	-0.9	9	-1.2	9	-1.0	9	1.0	9		9	10.5	9	14.5	9		9	18.6	9	15.0	9	7.8	9	2.9
10	-1.0	10	-1.3	10	-0.9	10	1.0	10		10	9.8	10	14.4	10		10	18.4	10	15.0	10	7.9	10	2.8
11	-1.2	11	-1.3	11	-0.7	11	1.2	11	4.7	11	9.9	11	14.9	11		11	18.3	11	14.7	11	7.9	11	2.5
12	-1.2	12	-1.3	12	-0.7	12	1.6	12		12	11.0	12	16.5	12		12	18.3	12	14.6	12		12	2.4
13	-1.2	13	-1.4	13	-0.5	13	1.1	13		13	11.4	13	17.2	13		13	18.3	13	14.3	13		13	2.3
14	-1.3	14	-1.5	14	-0.6	14	1.5	14		14	11.1	14	16.1	14		14	18.2	14	13.5	14		14	2.1
15	-1.4	15	-1.5	15	-0.3	15	2.2	15		15	11.0	15	15.6	15		15	18.3	15	13.5	15		15	2.1
16	-1.5	16	-1.5	16	-0.6	16	2.2	16		16	11.4	16	15.5	16		16	18.6	16	13.4	16		16	2.5
17	-1.5	17	-1.6	17	-0.6	17	2.1	17		17	11.3	17	16.0	17	17.7	17	18.5	17	13.4	17		17	2.1
18	-1.4	18	-1.5	18	-0.7	18	2.1	18		18	12.6	18	15.9	18	18.1	18	18.4	18	13.1	18		18	1.4
19	-1.3	19	-1.5	19	-0.7	19	1.8	19		19	12.2	19	15.7	19	18.5	19	18.1	19	13.1	19		19	0.8
20	-1.1	20	-1.4	20	-1.0	20	2.4	20	7.2	20	12.9	20	15.5	20	18.5	20	18.0	20	13.1	20		20	0.5
21	-0.6	21	-1.4	21	-0.8	21	2.8	21	7.2	21	12.1	21	15.7	21	19.2	21	17.8	21	13.0	21		21	0.3
22	-0.2	22	-1.4	22	-0.4	22	4.6	22	7.2	22	12.3	22	16.0	22	19.2	22	17.6	22	12.9	22		22	0.0
23	-0.7	23	-1.4	23	-0.3	23	6.0	23	7.9	23	12.6	23	16.0	23	19.0	23	17.5	23	12.7	23		23	0.0
24	-1.1	24	-1.5	24	-0.5	24	5.1	24	8.1	24	12.5	24	16.2	24	19.2	24	17.5	24	12.6	24		24	0.1
25	-1.1	25	-1.6	25	-0.5	25		25	8.5	25	12.5	25	16.0	25	19.6	25	17.5	25	12.5	25	5.8	25	0.0
26	-1.1	26	-1.6	26	-0.3	26		26	8.7	26	12.3	26	16.9	26	19.7	26	17.5	26	12.2	26	5.9	26	0.0
27	-0.8	27	-1.4	27	-0.2	27		27	8.6	27	12.2	27	17.2	27	20.4	27	17.3	27	12.0	27	5.8	27	0.1
28	-0.4	28	-1.3	28	-0.2	28		28	8.5	28	12.5	28	17.2	28	20.3	28	16.7	28	11.8	28	5.6	28	0.1
29	-0.2			29	-0.2	29	2.0	29	8.9	29	13.0	29		29	20.4	29	16.4	29	11.2	29	4.8	29	0.1
30	-0.2			30	-0.2	30		30	9.5	30	12.5	30		30	20.1	30	16.5	30	10.9	30	4.5	30	-0.2
31	0.0			31	-0.2			31	9.6			31		31	20.0			31	11.1			31	-0.3

1994

Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.	
Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)
1	-0.4	1	-1.6	1	-1.4	1	-0.9	1		1	12.8	1	15.4	1		1	21.5	1		1		1	4.8
2	-0.4	2	-1.6	2	-1.3	2	-0.8	2		2	12.5	2	16.0	2	20.2	2	21.6	2		2		2	4.8
3	-0.3	3	-1.7	3	-1.2	3	-0.8	3		3	12.6	3	16.6	3	19.8	3	21.5	3		3		3	4.7
4	-0.5	4	-1.7	4	-1.4	4	-0.7	4		4	12.9	4	16.7	4	20.7	4	21.4	4		4		4	4.5
5	-0.5	5	-1.7	5	-1.5	5	-0.8	5		5	13.4	5	16.9	5	21.2	5	21.6	5		5		5	4.3
6	-0.3	6	-1.7	6	-1.5	6	-0.7	6	6.0	6	14.0	6	16.0	6	21.2	6	21.8	6		6		6	4.0
7	-0.6	7	-1.6	7	-1.5	7	-0.6	7		7	14.5	7	16.4	7	22.0	7	21.8	7		7		7	3.9
8	-1.0	8	-1.6	8	-1.5	8	-0.6	8		8	14.6	8	16.5	8	22.3	8	21.7	8		8		8	3.8
9	-1.3	9	-1.6	9	-1.4	9	-0.6	9	7.5	9	15.1	9	16.2	9	22.3	9	21.5	9		9	10.2	9	3.7
10	-1.5	10	-1.6	10	-1.4	10	-0.5	10	7.4	10	15.1	10	16.2	10	22.0	10	21.3	10		10	9.9	10	3.2
11	-1.5	11	-1.6	11	-1.4	11	-0.5	11	7.6	11	15.1	11	15.5	11	21.9	11	21.2	11		11	9.5	11	2.7
12	-1.6	12	-1.6	12	-1.3	12	-0.4	12	7.6	12	15.1	12	15.3	12	21.6	12	21.1	12		12	9.4	12	2.6
13	-1.6	13	-1.6	13	-1.3	13	0.5	13	7.8	13	15.6	13	16.2	13	21.6	13	21.0	13		13	9.2	13	2.5
14	-1.5	14	-1.6	14	-1.2	14	1.3	14	7.4	14	15.3	14	16.9	14	21.5	14	20.9	14		14	8.8	14	2.2
15	-1.5	15	-1.6	15	-1.2	15	1.6	15	7.6	15	14.0	15	17.3	15	21.3	15	20.6	15		15	8.0	15	2.0
16	-1.6	16	-1.6	16	-1.3	16	1.7	16	7.5	16	13.8	16	17.4	16	21.2	16	20.5	16		16	7.5	16	1.4
17	-1.6	17	-1.5	17	-1.3	17	1.8	17	7.9	17	14.4	17	17.6	17	21.0	17	20.6	17		17	7.4	17	1.1
18	-1.6	18	-1.5	18	-1.3	18	2.1	18	8.4	18	13.8	18	18.3	18	21.0	18	20.9	18		18	7.4	18	0.8
19	-1.7	19	-1.5	19	-1.3	19	2.4	19	8.5	19	13.6	19	19.0	19	21.5	19	20.4	19		19	7.2	19	0.4
20	-1.7	20	-1.5	20	-1.4	20	2.3	20	8.8	20	13.8	20	18.8	20	21.2	20	19.6	20		20	7.1	20	0.0
21	-1.4	21	-1.5	21	-1.3	21	2.9	21	9.3	21	14.0	21	18.7	21	20.8	21	18.7	21		21	6.8	21	-0.4
22	-1.5	22	-1.5	22	-1.3	22	3.1	22	8.9	22	14.2	22	17.9	22	20.8	22	18.7	22		22	6.2	22	-0.3
23	-1.6	23	-1.4	23	-1.3	23	3.0	23	9.6	23	14.8	23		23	21.3	23	18.4	23		23	6.0	23	-0.6
24	-1.7	24	-1.4	24	-1.3	24	3.5	24	10.6	24	15.3	24		24	21.4	24	18.1	24		24	5.5	24	-0.7
25	-1.6	25	-1.4	25	-1.2	25	4.4	25	10.7	25	15.6	25		25	21.1	25	18.2	25		25	5.3	25	-0.7
26	-1.6	26	-1.4	26	-1.1	26	4.6	26	11.1	26	15.8	26	19.8	26	21.0	26	17.7	26		26	5.2	26	-0.7
27	-1.6	27	-1.4	27	-1.1	27	4.8	27	11.0	27	14.3	27		27	20.6	27	17.3	27		27	5.1	27	-1.0
28	-1.6	28	-1.4	28	-1.1	28	5.2	28	11.7	28	14.9	28		28	21.1	28	17.5	28		28	5.3	28	-1.0
29	-1.6			29	-1.0	29	5.4	29	12.2	29	15.2	29		29	21.6	29		29		29	5.6	29	-1.1
30	-1.6			30	-1.0	30	5.4	30	12.3	30	15.2	30		30	21.9	30		30		30	5.2	30	-1.2
31	-1.6			31	-0.9			31	12.8			31		31	22.1			31				31	-1.3

1995

Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.	
Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)
1	-1.6	1	-1.8	1	-1.9	1	-1.6	1		1	11.1	1	15.4	1	18.1	1	20.3	1	17.4	1	11.9	1	
2	-1.9	2	-1.8	2	-1.9	2	-1.5	2		2	11.3	2	15.3	2	18.4	2	20.3	2	17.3	2	11.6	2	
3	-1.8	3	-1.8	3	-1.9	3	-1.2	3		3	11.8	3	15.2	3	18.7	3	20.3	3	17.1	3	10.8	3	
4	-1.8	4	-1.8	4	-1.9	4	-1.2	4		4	12.1	4	14.6	4	19.0	4	20.1	4	16.7	4	10.4	4	
5	-1.7	5	-1.8	5	-1.9	5	-0.2	5		5	12.0	5	14.6	5	19.6	5	19.9	5	16.6	5	10.4	5	
6	-1.7	6	-1.8	6	-1.8	6	0.3	6		6	12.1	6	15.5	6	19.8	6	19.6	6	16.2	6	10.2	6	4.6
7	-1.7	7	-1.8	7	-1.8	7	0.0	7		7	12.2	7	15.9	7	20.1	7	19.4	7	15.7	7	10.1	7	4.4
8	-1.6	8	-1.8	8	-1.8	8	0.1	8		8	12.4	8	16.8	8	19.8	8	19.1	8	15.3	8	10.0	8	3.7
9	-1.6	9	-1.8	9	-1.8	9	0.6	9		9	13.4	9	17.0	9	19.1	9	19.0	9	15.2	9	9.3	9	3.4
10	-1.5	10	-1.8	10	-1.9	10	1.3	10		10	13.2	10	17.8	10	18.9	10	19.1	10	15.1	10	9.0	10	2.8
11	-1.5	11	-1.8	11	-1.9	11	1.6	11		11	13.0	11	17.3	11	18.8	11	19.0	11	15.0	11	8.8	11	2.5
12	-1.6	12	-1.8	12	-1.8	12	1.7	12		12	13.3	12	17.3	12	19.0	12	18.7	12	14.9	12	8.4	12	2.6
13	-1.5	13	-1.8	13	-1.8	13	2.0	13		13	14.2	13	17.7	13	19.2	13	18.6	13	14.9	13	8.1	13	2.7
14	-1.8	14	-1.8	14	-1.9	14	1.9	14		14	14.3	14	17.0	14	19.2	14	18.8	14	14.9	14	8.3	14	2.6
15	-1.8	15	-1.9	15	-1.8	15	2.4	15		15	14.2	15	17.0	15	19.3	15	18.6	15	14.6	15	8.0	15	2.2
16	-1.8	16	-1.9	16	-1.8	16	3.0	16	10.0	16	14.7	16	16.6	16	19.8	16	18.5	16	14.6	16	7.5	16	1.9
17	-1.8	17	-1.9	17	-1.8	17	2.9	17	9.8	17	14.8	17	16.5	17	19.5	17	18.3	17	14.6	17	7.2	17	1.7
18	-1.8	18	-1.9	18	-1.8	18	3.3	18	9.9	18	14.9	18	16.6	18	19.6	18	17.9	18	14.5	18	7.3	18	1.4
19	-1.8	19	-1.9	19	-1.8	19	3.3	19	10.3	19	14.9	19	17.6	19	19.6	19	17.8	19	14.5	19		19	1.1
20	-1.8	20	-1.9	20	-1.8	20	3.3	20	10.8	20	14.5	20	17.5	20	19.7	20	17.8	20	14.4	20		20	0.8
21	-1.8	21	-1.8	21	-1.7	21	3.3	21	10.7	21	14.4	21	17.5	21	19.4	21	17.8	21	14.1	21		21	0.4
22	-1.8	22	-1.8	22	-1.7	22	3.8	22	10.8	22	14.5	22	18.0	22	19.4	22	17.9	22	13.9	22		22	0.4
23	-1.8	23	-1.9	23	-1.6	23	3.8	23	10.4	23	14.8	23	18.3	23	20.4	23	17.9	23	13.8	23		23	0.1
24	-1.8	24	-1.9	24	-1.6	24	4.0	24	10.4	24	14.9	24	18.9	24	19.5	24	17.9	24	13.8	24		24	-0.2
25	-1.8	25	-1.9	25	-1.5	25	4.1	25	10.5	25	15.2	25	19.3	25	19.6	25	17.6	25	13.8	25		25	0.3
26	-1.7	26	-1.9	26	-1.4	26	3.8	26	10.7	26	15.4	26	20.2	26	19.8	26	17.5	26	13.6	26		26	0.3
27	-1.8	27	-1.9	27	-1.4	27	4.1	27	10.6	27	15.2	27	20.8	27	19.8	27	17.6	27	13.3	27		27	0.1
28	-1.7	28	-1.9	28	-1.3	28		28	11.0	28	15.1	28	19.9	28	19.6	28	17.6	28	12.7	28		28	0.0
29	-1.7			29	-1.4	29		29	11.6	29	15.8	29	18.9	29	19.6	29	17.4	29	12.5	29		29	-0.1
30	-1.8			30	-1.5	30		30	11.3	30	15.7	30	20.2	30	19.8	30	17.3	30	12.4	30		30	-0.2
31	-1.7			31	-1.7			31	10.9			31	19.2	31	20.1			31	12.3			31	-0.2

1996

Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.	
Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)	Date	(°C)
1	-0.2	1	-1.8	1	-1.8	1	-0.6	1	5.1	1		1		1		1		1		1		1	
2	-0.2	2	-1.8	2	-1.8	2	-0.3	2	4.7	2		2		2		2		2		2		2	
3	-0.3	3	-1.7	3	-1.7	3	-0.2	3	4.9	3		3		3		3		3		3		3	
4	-0.4	4	-1.7	4	-1.7	4	-0.3	4	5.2	4		4		4		4		4		4		4	
5	-0.5	5	-1.7	5	-1.7	5	-0.2	5	5.2	5		5		5		5		5		5		5	
6	-0.4	6	-1.7	6	-1.8	6	0.0	6	4.9	6		6		6		6		6		6		6	
7	-0.4	7	-1.7	7	-1.7	7	0.2	7	5.1	7		7		7		7		7		7		7	
8	-0.7	8	-1.8	8	-1.7	8	0.7	8	5.3	8		8		8		8		8		8		8	
9	-0.7	9	-1.8	9	-1.7	9	1.2	9	7.4	9		9		9		9		9		9		9	
10	-0.7	10	-1.8	10	-1.7	10	0.6	10	6.2	10		10		10		10		10		10		10	
11	-0.7	11	-1.8	11	-1.7	11	0.4	11	5.1	11		11		11		11		11		11		11	
12	-0.7	12	-1.8	12	-1.7	12	1.0	12	7.0	12		12		12		12		12		12		12	
13	-1.0	13	-1.7	13	-1.6	13	0.5	13	6.4	13		13		13		13		13		13		13	
14	-1.4	14	-1.7	14	-1.7	14	1.1	14	6.3	14		14		14		14		14		14		14	
15	-1.4	15	-1.6	15	-1.7	15	1.3	15		15		15		15		15		15		15		15	
16	-1.4	16	-1.6	16	-1.6	16	2.1	16		16		16		16		16		16		16		16	
17	-1.5	17	-1.7	17	-1.6	17	2.2	17		17		17		17		17		17		17		17	
18	-1.6	18	-1.7	18	-1.6	18	1.9	18		18		18		18		18		18		18		18	
19	-1.7	19	-1.8	19	-1.4	19	1.6	19		19		19		19		19		19		19		19	
20	-1.6	20	-1.7	20	-1.2	20	2.0	20		20		20		20		20		20		20		20	
21	-1.6	21	-1.7	21	-0.9	21	2.2	21		21		21		21		21		21		21		21	
22	-1.7	22	-1.7	22	-0.9	22	2.7	22		22		22		22		22		22		22		22	
23	-1.7	23	-1.7	23	-1.0	23	2.8	23		23		23		23		23		23		23		23	
24	-1.7	24	-1.7	24	-1.0	24	3.1	24		24		24		24		24		24		24		24	
25	-1.8	25	-1.7	25	-0.9	25	3.2	25		25		25		25		25		25		25		25	
26	-1.8	26	-1.8	26	-1.0	26	3.9	26		26		26		26		26		26		26		26	
27	-1.8	27	-1.8	27	-1.0	27	5.4	27		27		27		27		27		27		27		27	
28	-1.7	28	-1.8	28	-0.9	28	4.8	28		28		28		28		28		28		28		28	
29	-1.7		-1.8	29	-0.8	29	6.2	29		29		29		29		29		29		29		29	
30	-1.7			30	-0.8	30	6.1	30		30		30		30		30		30		30		30	
31	-1.8			31	-0.6			31				31		31				31				31	

Table 3. Daily values of air temperature, wind speed and azimuth, and solar radiation obtained at Kimuaneppu during the period between December 1995 and November 1996.

December 1995 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1	2.7	4.5	1.2	3.7	6.5	2.0	W	3.82	0.34	0.00
2	3.8	4.4	3.0	9.5	16.2	3.3	NNW	2.16	0.15	0.00
3	2.8	3.7	1.6	14.9	18.8	10.5	NNW	1.24	0.06	0.00
4	3.6	4.2	2.2	8.2	12.7	3.8	N	2.09	0.14	0.00
5	3.7	3.9	3.2	4.6	7.3	2.1	NE	2.21	0.13	0.00
6	2.9	3.5	1.8	6.1	9.9	2.7	NNE	3.95	0.36	0.00
7										
8										
9	-1.8	0.0	-4.5	7.9	13.5	2.1	WNW	2.64	0.54	0.00
10	-0.3	3.3	-5.3	7.3	10.9	2.0	SSW	6.13	0.46	0.00
11	-1.0	1.7	-2.5	4.6	10.7	2.0	WNW	1.37	0.09	0.00
12	-2.0	-0.8	-5.5	6.7	10.7	2.1	WNW	8.75	0.51	0.00
13	-2.0	-1.1	-3.3	10.5	15.5	3.0	WNW	7.66	0.50	0.00
14	-2.4	-1.2	-4.2	7.7	11.8	2.0	WNW	6.51	0.43	0.00
15	-4.2	-2.2	-6.2	3.3	7.1	2.0	SSW	4.17	0.35	0.00
16	-4.1	-2.7	-7.1	7.4	15.1	2.2	W	4.81	0.38	0.00
17	-5.0	-3.4	-7.3	7.1	11.6	2.5	WNW	7.92	0.49	0.00
18	-3.9	-2.7	-4.8	11.0	16.1	7.2	WNW	6.67	0.48	0.00
19	-4.3	-3.4	-5.1	10.6	14.8	6.7	WNW	9.21	0.59	0.00
20	-2.9	0.5	-5.7	5.2	11.6	2.0	W	8.12	0.44	0.00
21	-2.1	1.2	-5.7	2.7	4.7	2.0	S	5.73	0.57	0.00
22	-3.2	-1.6	-7.5	5.8	11.2	2.1	NW	6.02	0.62	0.00
23	-2.9	-0.3	-5.6	3.7	7.3	2.0	WNW	2.80	0.20	0.00
24	-2.4	-0.8	-4.9	5.2	12.3	2.0	SSW	4.49	0.29	0.00
25	-1.7	-0.3	-3.5	13.0	19.1	6.0	NNE	2.57	0.24	0.00
26	-1.6	-0.2	-3.5	12.6	18.3	7.5	NNW	3.78	0.59	0.00
27	-1.5	-0.4	-4.1	9.2	14.3	2.9	NNW	3.52	0.31	0.00
28	-1.6	2.0	-5.7	3.9	7.5	2.0	WNW	8.05	0.43	0.00
29	0.0	3.8	-3.8	5.7	10.5	2.0	S	5.79	0.47	0.00
30	-0.8	1.9	-5.2	3.8	8.2	2.0	S, W	7.58	0.41	0.00
31	0.8	3.1	-1.3	5.5	10.1	2.1	S	6.39	0.46	0.00

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1	0	0	0	0	1	0	1	2	10	3	4	2	23	16	0	0	62
2	42	0	0	0	0	0	0	0	0	0	0	0	0	17	2	83	144
3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	52	90	144
4	63	3	0	0	0	0	0	0	0	0	0	0	4	17	17	40	144
5	18	10	73	14	0	0	0	0	0	0	0	0	0	0	1	28	144
6	38	69	33	0	0	0	0	0	0	0	0	0	0	0	0	4	144
7																	
8																	
9	5	0	0	0	0	0	0	0	3	15	5	1	6	67	24	13	139
10	0	0	0	0	0	0	0	0	25	40	2	0	4	33	29	3	136
11	22	19	2	0	0	0	0	0	0	0	0	2	8	31	15	9	108
12	0	0	0	0	0	0	0	0	0	1	2	5	52	57	27	0	144
13	0	0	0	0	0	0	0	0	0	0	0	1	33	84	26	0	144
14	0	0	0	0	0	0	0	0	0	1	3	3	22	63	41	6	139
15	0	0	0	0	0	0	2	2	27	34	7	8	7	0	0	0	87
16	5	0	0	0	0	0	0	0	0	1	3	13	52	43	13	14	144
17	0	0	0	0	0	0	0	0	0	0	10	35	29	43	24	0	141
18	0	0	0	0	0	0	0	0	0	0	0	0	9	107	28	0	144
19	0	0	0	0	0	0	0	0	0	0	0	1	28	108	7	0	144
20	0	0	0	0	1	1	2	3	7	19	6	4	44	18	0	0	105
21	2	8	7	6	0	2	4	5	13	8	1	0	0	2	2	0	60
22	25	1	7	1	0	0	3	3	15	14	3	1	0	6	39	15	133
23	3	0	0	0	0	3	14	16	10	8	4	3	10	20	15	8	114
24	1	12	3	6	10	11	7	8	30	46	2	0	0	0	0	0	136
25	36	44	17	12	0	0	0	0	0	0	0	0	0	0	0	35	144
26	26	0	0	0	0	0	0	0	0	0	0	0	0	27	17	74	144
27	30	0	0	0	0	0	0	0	0	0	0	1	31	21	15	44	142
28	0	0	0	0	3	20	3	4	16	12	1	0	3	40	13	0	115
29	0	0	0	2	0	5	17	20	49	17	1	0	4	0	2	0	117
30	0	0	2	11	0	1	6	3	14	9	8	1	14	13	1	0	83
31	0	0	0	0	0	3	9	6	37	9	1	2	36	23	1	0	127
Total	316	166	144	52	15	46	68	72	256	237	63	83	419	858	411	466	3672

January 1996 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1	-3.4	0.7	-5.5	11.2	19.0	4.1	WNW	5.85	0.52	0.00
2	-2.3	0.1	-5.0	8.7	22.3	2.0	WNW	3.97	0.37	0.00
3	0.6	4.6	-4.7	10.1	18.3	3.8	S	5.96	0.44	0.00
4	-2.0	4.0	-4.3	9.0	19.9	2.0	WSW	6.44	0.45	0.00
5	-3.6	-1.5	-7.1	9.6	13.4	2.2	WNW	5.93	0.49	0.00
6	-2.1	-1.1	-3.3	9.3	13.0	4.9	W	6.32	0.43	0.00
7	-2.0	-0.9	-2.8	11.0	17.1	6.4	WNW	9.01	0.50	0.00
8	-4.1	-1.4	-6.5	5.1	10.2	2.0	ESE	1.81	0.13	0.00
9	-3.7	-2.6	-5.0	13.3	21.2	7.0	W	5.56	0.40	0.00
10	-1.3	0.3	-3.8	11.2	21.0	4.8	WSW	3.39	0.47	0.00
11	-0.5	0.1	-1.9	11.2	17.3	5.7	NNW	2.98	0.32	0.00
12	-2.7	-0.4	-5.5	13.5	18.6	10.2	NNW	4.00	0.36	0.00
13	-4.9	-2.9	-8.5	10.0	18.3	2.0	NNW	4.72	0.45	0.00
14	-2.5	1.8	-7.6	5.9	9.4	2.4	SSW	9.10	0.50	0.00
15	0.0	2.6	-1.5	3.5	6.1	2.0	SSW	5.06	0.44	0.00
16	-3.0	-1.1	-6.5	7.7	15.0	2.0	NW	3.07	0.21	0.00
17	-7.3	-5.6	-9.6	5.0	11.4	2.0	W	7.71	0.51	0.00
18	-7.6	-5.2	-9.5	7.5	14.3	2.0	WNW	4.85	0.44	0.00
19	-8.3	-3.9	-13.1	4.5	9.4	2.0	S	9.30	0.52	0.00
20	-4.5	-0.9	-9.4	4.8	11.8	2.0	SSW	9.61	0.52	0.00
21	-4.0	0.0	-7.7	7.4	13.5	2.0	NNW	4.89	0.36	0.00
22	-6.8	-2.7	-12.5	5.8	10.7	2.0	S	10.40	0.59	0.00
23	-6.4	-1.1	-10.5	4.5	12.0	2.0	NNW	8.68	0.58	0.00
24	-11.5	-7.2	-16.3	7.6	15.9	2.2	NW	8.78	0.55	0.00
25	-11.8	-10.0	-14.9	4.8	11.2	2.1	WNW	5.26	0.27	0.00
26	-7.1	-3.3	-13.4	9.2	13.2	4.1	WNW	6.79	0.45	0.00
27	-2.4	1.3	-6.0	5.8	10.0	2.1	W	11.26	0.58	0.00
28	-5.9	-2.6	-11.3	4.2	9.7	2.0	WNW	11.03	0.60	0.00
29	-5.5	0.5	-11.9	4.5	9.8	2.0	SSW	8.66	0.63	0.00
30	-8.8	-5.5	-12.9	6.5	10.3	2.0	WNW	7.01	0.60	0.00
31	-13.1	-12.3	-14.4	6.7	10.9	2.2	W	7.92	0.58	0.00

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1	0	0	0	0	0	0	0	0	0	0	2	7	26	90	19	0	144
2	6	0	0	0	1	1	1	2	3	14	4	0	0	64	16	9	121
3	0	0	0	0	1	0	1	11	96	32	1	0	0	0	0	0	142
4	0	0	0	0	0	0	0	1	0	8	16	55	50	10	1	0	141
5	0	0	0	0	0	0	0	1	4	5	3	1	6	63	43	0	126
6	0	0	0	0	0	0	0	0	0	0	0	1	79	64	0	0	144
7	0	0	0	0	0	0	0	0	0	1	5	4	39	82	13	0	144
8	0	1	3	3	6	30	6	5	15	18	3	9	19	3	6	1	128
9	0	0	0	0	0	0	0	0	0	0	2	28	57	51	6	0	144
10	6	1	0	0	0	0	0	0	0	0	9	40	22	11	34	21	144
11	17	1	0	0	0	0	0	0	0	0	0	0	0	20	33	73	144
12	13	0	0	0	0	0	0	0	0	0	0	0	0	3	47	81	144
13	1	0	0	0	0	0	0	0	0	20	2	0	1	34	39	46	143
14	0	0	0	0	0	0	0	0	42	97	4	1	0	0	0	0	144
15	9	1	0	0	1	0	2	5	15	21	2	1	2	0	3	5	67
16	2	0	0	2	20	3	2	0	0	0	0	0	1	13	31	24	98
17	0	0	0	0	3	10	2	1	10	18	5	17	31	24	4	1	126
18	1	0	1	0	0	0	5	6	24	15	1	0	4	34	28	4	123
19	0	0	0	0	3	5	11	14	34	33	4	0	8	12	2	0	126
20	0	0	2	0	4	10	7	13	33	35	5	0	0	0	0	0	109
21	1	0	0	0	0	0	0	1	1	5	4	3	9	3	46	50	123
22	0	2	0	0	0	1	2	6	57	23	4	3	6	7	8	2	121
23	6	1	0	1	0	0	1	5	19	4	4	10	11	16	12	31	121
24	0	0	0	0	0	0	0	6	22	24	10	6	7	26	33	5	139
25	0	0	0	0	0	0	0	3	14	27	2	10	32	39	8	1	136
26	0	0	0	0	0	0	0	0	2	0	2	29	32	51	27	1	144
27	0	0	0	0	0	0	1	5	5	1	10	26	50	28	0	0	126
28	1	1	0	2	2	1	1	2	2	6	0	4	16	24	9	16	87
29	0	6	7	3	3	1	2	4	27	28	5	0	16	7	3	2	114
30	0	0	0	0	1	0	0	0	6	11	7	16	23	30	26	18	138
31	0	0	0	0	0	1	1	0	4	3	3	12	68	40	2	0	134
Total	63	14	13	11	45	63	45	91	435	449	119	283	615	849	499	391	3985

February 1996 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1	-12.3	-10.0	-14.5	5.9	13.0	2.0	W	8.43	0.77	0.00
2	-8.0	-6.2	-10.2	8.3	12.4	5.6	W	11.41	0.64	0.00
3	-6.2	-4.4	-8.5	7.6	12.8	4.7	W	8.92	0.73	0.00
4	-5.6	-2.1	-10.5	4.2	7.3	2.1	W	11.55	0.77	0.00
5										
6										
7	-5.9	-3.9	-10.8	4.9	11.2	2.0	W	7.78	0.48	0.00
8	-5.4	-2.1	-11.4	2.9	4.9	2.0	SE	9.85	0.71	0.00
9	-5.7	-3.3	-9.1	5.8	10.6	2.1	WNW	8.18	0.53	0.00
10	-8.8	-5.9	-12.8	5.1	12.4	2.1	WSW	13.63	0.67	0.00
11	-3.2	1.6	-11.2	5.5	11.5	2.1	W	14.13	0.74	0.00
12	2.4	6.7	-3.4	5.4	11.3	2.0	S	13.76	0.68	0.00
13	-2.2	3.2	-8.2	6.1	17.1	2.0	NW	13.03	0.63	0.00
14	1.8	6.1	-4.5	10.4	17.6	2.6	SSE	10.20	0.57	0.00
15	-5.1	-1.3	-11.5	6.6	14.8	2.0	WNW	10.67	0.71	0.00
16	-11.1	-8.9	-14.1	5.0	9.2	2.0	WNW	9.02	0.59	0.00
17	-9.8	-5.2	-16.7	5.0	10.1	2.0	N	12.05	0.64	0.00
18	-9.1	-1.7	-18.4	4.7	10.7	2.1	WNW	13.91	0.66	0.00
19	-11.5	-3.6	-20.4	3.6	7.6	2.1	N	16.21	0.73	0.00
20	-14.7	-8.5	-23.0	2.8	4.3	2.0	E	15.60	0.71	0.00
21	-12.6	-7.2	-18.5	3.0	5.8	2.0	W	15.92	0.73	0.00
22	-11.0	-4.2	-18.0	3.4	5.0	2.0	E	15.84	0.77	0.00
23	-12.2	-6.7	-18.9	3.3	4.7	2.0	ENE	14.95	0.68	0.00
24	-9.7	-0.4	-18.5	3.1	5.4	2.0	WNW	16.72	0.71	0.00
25	-2.7	3.5	-8.2	4.9	10.1	2.0	S	16.63	0.71	0.00
26	-1.4	4.4	-7.6	3.3	5.8	2.0	SSW	15.49	0.72	0.00
27	-0.4	6.3	-4.8	4.2	6.9	2.0	S	16.11	0.74	0.00
28	-3.7	-1.4	-9.1	5.1	7.5	2.0	NNW	10.25	0.88	0.00
29	-1.4	3.9	-8.9	4.9	10.0	2.0	SE	14.49	0.79	0.00

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1	0	0	0	1	0	2	3	1	18	15	10	22	62	1	1	1	137
2	0	0	0	0	0	1	0	2	3	2	4	26	82	10	13	1	144
3	2	0	0	0	0	0	0	0	1	2	5	7	76	13	15	23	144
4	6	1	2	1	0	0	1	0	6	11	1	2	56	3	2	5	97
5																	
6																	
7	9	9	0	0	0	0	0	0	0	0	8	9	37	34	11	9	126
8	0	0	3	11	9	11	12	8	9	8	6	5	1	0	0	0	83
9	26	1	0	0	1	2	0	0	3	1	1	3	27	30	13	11	119
10	0	0	0	0	0	0	0	0	0	4	17	49	29	21	12	1	133
11	1	2	1	0	1	2	2	19	23	6	4	23	28	13	0	0	125
12	1	0	1	0	0	2	7	29	41	12	7	8	18	3	1	0	130
13	11	2	8	11	13	8	4	2	0	0	1	0	3	20	26	4	113
14	0	0	1	5	4	10	19	47	11	13	3	13	15	3	0	0	144
15	13	4	4	0	0	0	0	0	0	1	8	10	26	38	22	16	142
16	7	0	0	0	0	0	0	1	1	0	5	6	16	24	4	5	69
17	18	3	1	0	0	0	0	1	11	12	5	3	2	12	14	12	94
18	0	0	0	2	1	8	15	12	11	7	3	14	11	19	9	3	115
19	18	6	9	3	0	1	2	11	2	3	1	0	0	2	0	1	59
20	0	3	2	10	16	7	5	7	1	5	3	0	0	0	0	0	59
21	0	5	7	1	0	0	0	1	4	9	9	6	23	10	0	1	76
22	0	1	3	16	17	2	1	6	6	9	0	2	2	0	0	0	65
23	0	3	16	21	0	0	1	0	0	0	7	1	0	1	1	1	52
24	0	0	0	0	0	0	0	3	11	5	1	1	0	14	1	1	37
25	0	0	0	0	0	1	4	25	35	11	1	16	21	7	1	0	122
26	0	2	5	2	0	2	2	7	5	24	16	1	6	3	13	6	94
27	0	0	5	3	0	0	2	8	32	22	12	9	19	6	2	0	120
28	1	0	0	0	0	0	2	0	0	1	1	1	19	6	26	32	89
29	0	0	1	1	2	8	43	9	9	2	0	0	21	6	1	0	103
Total	113	42	69	88	64	67	125	199	243	185	139	237	600	299	188	133	2791

March 1996 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1	1.7	5.2	-0.9	4.5	11.3	2.0	SSE	12.36	0.71	0.00
2	-2.4	-0.9	-3.5	13.2	17.6	7.1	NW	8.18	0.42	0.00
3	-4.3	-3.3	-5.5	8.5	13.1	3.2	NNW	14.17	1.11	0.00
4	-6.2	-2.4	-8.7	2.8	4.2	2.0	NE	12.21	0.67	0.00
5	-7.6	-3.8	-12.1	5.1	9.6	2.0	WSW	10.63	0.61	0.00
6	-8.5	-2.9	-16.6	4.1	6.0	2.0	SSW	17.83	0.87	0.00
7	-8.5	-4.4	-15.1	4.7	10.6	2.0	WSW	20.40	0.80	0.00
8	-9.7	-6.1	-15.5	3.6	5.6	2.0	WSW	21.11	0.81	0.00
9	-9.5	-6.1	-14.3	3.8	6.5	2.0	SSW	18.59	1.05	0.00
10	-10.4	-5.8	-16.8	2.7	4.5	2.0	S	19.41	0.80	0.00
11	-7.4	2.3	-16.7	4.5	9.3	2.1	S	16.70	0.80	0.00
12	-6.2	-3.6	-10.5	6.1	11.5	2.1	WSW	16.75	0.93	0.00
13	-2.4	5.9	-9.5	3.8	7.0	2.0	ESE	18.77	0.87	0.00
14	0.2	3.5	-6.4	4.5	9.3	2.0	ESE	20.01	0.82	0.00
15	3.1	7.0	-0.5	4.2	8.0	2.0	S	17.80	0.87	0.00
16	0.3	3.3	-3.8	5.1	11.8	2.1	WNW	19.13	0.79	0.00
17	0.4	3.5	-1.9	4.7	9.9	2.2	ESE	10.79	0.54	0.00
18	-0.1	3.9	-1.8	7.6	16.3	2.0	NW	13.34	0.96	0.00
19	-2.2	-0.7	-4.1	7.2	15.2	2.0	NW	14.02	0.77	0.00
20	-1.9	1.1	-6.3	5.8	15.0	2.0	W	19.77	1.12	0.00
21	0.4	4.9	-5.2	5.2	14.5	2.0	SE	18.16	0.89	0.00
22	-1.0	2.0	-2.5	5.5	12.0	2.0	E	4.66	0.19	0.00
23	-3.1	-1.4	-5.4	9.8	20.0	2.3	NNW	18.51	0.87	0.00
24	-1.8	1.4	-5.1	3.6	5.9	2.0	SSE	19.61	0.92	0.00
25	1.2	4.3	-0.8	3.5	8.1	2.0	S	12.91	1.07	0.00
26	-0.6	1.9	-3.7	6.4	13.3	2.2	WNW	16.75	1.06	0.00
27	-1.5	1.9	-4.1	3.8	8.2	2.0	W	17.71	1.07	0.00
28	-0.4	2.2	-3.1	4.1	9.5	2.0	SSW	20.03	1.01	0.00
29	1.6	5.4	-1.4	4.8	10.0	2.1	W	20.94	0.86	0.00
30	2.7	5.9	0.4	5.4	11.4	2.0	SE	15.97	0.70	0.00
31	3.2	7.3	0.7	5.1	13.7	2.3	SSE	7.03	0.51	0.00

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1	1	3	8	7	10	7	20	26	20	9	1	0	0	6	9	2	129
2	0	0	0	0	0	0	0	0	0	0	0	0	0	10	111	23	144
3	0	0	0	0	0	0	0	0	0	2	20	8	4	8	48	54	144
4	9	9	23	2	0	0	2	3	5	7	0	9	0	2	0	1	72
5	0	2	1	1	0	0	0	2	32	27	15	53	9	0	0	0	142
6	0	0	1	3	2	2	0	2	11	25	0	0	1	1	3	1	52
7	0	0	0	0	1	1	1	6	31	15	10	33	0	0	0	0	98
8	0	0	0	0	0	2	1	6	18	2	4	35	12	0	0	0	80
9	0	1	0	0	0	3	0	3	29	32	8	13	6	7	5	0	107
10	6	6	0	0	0	0	1	3	17	10	7	1	2	5	0	1	59
11	0	2	2	6	7	3	2	1	12	5	3	11	7	2	0	0	63
12	0	2	0	0	0	0	3	0	10	8	14	42	18	7	6	0	110
13	0	5	8	14	4	27	25	6	3	5	0	0	0	0	0	0	97
14	0	6	8	15	17	29	16	12	13	7	1	0	0	0	0	0	124
15	1	2	2	5	10	18	8	11	21	20	6	6	4	4	3	0	121
16	5	1	0	0	0	0	0	1	0	1	0	5	14	46	32	15	120
17	0	0	0	3	24	36	13	11	20	9	9	7	2	0	0	0	134
18	0	0	0	0	3	25	8	2	7	7	3	2	7	4	58	7	133
19	0	0	0	0	0	0	0	0	2	3	3	5	12	13	80	9	127
20	0	0	0	1	1	1	1	5	10	5	14	19	28	20	1	0	106
21	1	4	3	1	2	13	22	12	3	7	3	12	11	11	6	7	118
22	12	3	11	14	18	10	10	15	6	0	0	0	0	0	0	10	109
23	13	0	0	0	0	0	0	0	0	0	0	8	14	11	38	58	142
24	4	1	2	10	5	15	7	31	19	9	3	1	1	5	2	2	117
25	0	4	7	8	1	1	4	7	24	18	9	3	2	4	2	0	94
26	0	0	0	0	0	0	0	1	3	1	5	12	14	52	41	8	137
27	2	2	1	3	4	4	2	0	1	15	8	15	18	15	7	5	102
28	5	1	0	0	0	1	1	0	2	24	22	9	5	17	13	9	109
29	0	0	1	8	9	13	2	2	1	1	4	26	30	10	5	0	112
30	0	0	1	12	11	37	41	8	3	0	0	0	0	0	0	0	113
31	0	0	0	0	1	18	14	39	6	0	4	13	31	5	0	0	131
Total	59	54	79	113	130	266	204	215	329	274	176	348	252	265	470	212	3446

April 1996 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1	1.8	4.4	-0.7	5.7	12.2	2.0	W	20.71	1.16	0.00
2	-0.2	2.3	-2.1	3.7	6.9	2.0	S	19.05	0.88	0.00
3	0.6	4.1	-1.7	3.5	5.3	2.0	SSE	11.69	0.63	0.00
4										
5										
6	1.0	3.1	-2.1	4.7	9.0	2.0	WNW	16.61	1.08	0.00
7	0.4	2.9	-1.1	2.7	5.6	2.0	WSW	12.45	0.82	0.00
8	-0.2	2.4	-3.3	3.2	6.6	2.0	WSW	21.82	1.01	0.00
9	-0.9	-0.3	-1.3	3.2	5.1	2.0	N	18.28	1.09	0.00
10	-1.2	-0.3	-2.2	3.6	6.9	2.0	ENE	13.20	1.04	0.00
11	-2.2	-0.9	-4.8	3.4	5.3	2.0	NE	13.40	0.74	0.00
12	-3.3	-1.4	-5.8	4.3	6.5	2.0	N	25.43	0.97	0.00
13	-1.7	0.9	-2.9	5.7	13.9	2.0	NNW	15.69	0.98	0.00
14	3.8	8.7	-2.2	5.2	9.2	2.3	S	22.84	0.91	0.00
15	3.9	8.8	-1.3	9.6	17.8	2.1	WNW	23.57	0.93	0.00
16	4.4	10.6	-1.4	3.9	7.5	2.0	S	20.41	0.83	0.00
17	0.9	2.5	-0.2	3.9	7.7	2.0	NE	18.09	0.75	0.00
18	0.9	4.3	-0.9	5.7	9.7	2.0	ESE	10.31	0.68	0.00
19	-0.7	-0.1	-1.1	5.9	10.0	2.0	NE	11.23	0.75	0.00
20	-0.2	0.6	-1.5	5.1	8.7	2.0	ENE	13.13	0.85	0.00
21	0.1	1.6	-1.0	3.1	5.3	2.0	NNE	13.93	0.80	0.00
22	2.7	5.7	-2.2	5.0	10.2	2.0	ENE	25.14	1.20	0.00
23	7.9	15.9	3.3	7.9	15.0	2.0	S	12.37	0.84	0.00
24	6.7	10.7	1.9	4.8	7.9	2.0	ENE	21.49	0.83	0.00
25	12.3	19.3	5.6	6.0	11.1	2.1	SSW	10.29	0.52	0.00
26	10.7	20.7	2.9	4.1	8.3	2.0	NNE	19.68	0.84	0.00
27	8.2	13.1	5.0	3.3	6.2	2.0	NNE	15.33	0.79	0.00
28	3.6	7.4	2.1	4.3	7.9	2.0	NW	16.49	0.98	0.00
29	7.4	16.6	2.1	4.0	8.8	2.0	N	5.91	0.62	0.00
30	6.5	15.9	2.0	3.8	7.2	2.0	NNE	24.74	0.92	0.00

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1	0	0	1	0	0	2	9	4	1	5	17	34	37	7	5	0	122
2	1	1	2	1	0	0	7	6	25	19	6	8	0	3	6	17	102
3	3	3	6	5	9	7	3	29	16	8	2	0	0	1	0	0	92
4																	
5																	
6	1	0	0	0	0	0	0	2	2	2	1	7	21	41	29	26	132
7	2	8	6	2	3	5	8	5	0	6	8	9	1	2	1	1	67
8	9	8	4	2	4	4	4	5	6	7	9	14	4	8	5	5	98
9	18	8	12	2	2	0	1	2	0	1	0	3	4	1	12	5	71
10	0	0	14	53	15	22	7	0	0	0	0	0	0	0	0	0	111
11	0	4	53	22	2	0	0	0	0	0	0	1	0	0	0	0	82
12	41	5	0	0	0	0	0	0	0	0	10	9	3	3	4	14	89
13	11	0	1	0	0	0	0	0	1	19	3	2	1	3	30	47	118
14	0	0	0	0	0	1	0	3	47	11	10	17	21	29	0	0	139
15	9	1	1	3	3	2	0	1	6	22	4	9	5	30	12	19	127
16	0	0	0	1	1	4	21	20	50	16	1	1	0	0	0	0	115
17	0	7	63	9	3	6	12	7	1	0	0	0	0	0	0	0	108
18	0	0	14	24	24	27	20	4	0	0	0	0	0	0	0	0	113
19	1	57	58	28	0	0	0	0	0	0	0	0	0	0	0	0	144
20	0	0	8	57	25	5	1	1	0	0	0	0	0	0	0	0	97
21	11	22	4	0	0	1	0	1	1	2	0	0	1	6	18	14	81
22	0	1	10	39	3	0	0	4	29	18	1	0	0	0	0	2	107
23	1	2	3	3	3	4	1	12	66	24	2	3	0	0	0	0	124
24	0	2	25	29	7	4	4	0	9	3	2	0	0	0	2	1	88
25	2	3	8	0	7	4	14	24	16	25	0	0	2	1	1	3	110
26	4	13	6	2	4	5	11	9	2	6	10	4	4	4	3	1	88
27	4	21	12	0	1	2	2	0	0	1	2	1	1	4	5	13	69
28	4	5	2	0	1	1	0	1	2	4	4	8	5	9	29	24	99
29	17	13	13	7	1	5	2	5	1	12	9	6	2	2	2	14	111
30	1	36	18	15	7	5	2	3	3	2	5	8	1	1	0	1	108
Total	140	220	344	304	125	116	129	148	284	213	106	144	113	155	164	207	2912

May 1996 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1	5.9	8.1	1.9	6.3	12.3	2.0	ENE	26.17	0.95	0.00
2	10.0	15.3	6.8	6.1	12.6	2.2	SE	14.03	0.87	0.00
3	9.2	13.4	5.5	6.5	10.9	2.1	SE	8.42	0.52	0.00
4	4.1	6.8	1.9	7.6	10.9	2.2	NW	8.93	0.64	0.00
5	1.2	2.0	0.0	5.1	8.5	2.1	N	14.43	1.10	0.00
6	1.1	1.5	0.7	8.2	11.6	4.4	NNW	4.86	0.26	0.00
7	1.1	3.0	-0.5	4.9	8.2	2.1	NNW	16.85	1.01	0.00
8	1.8	4.0	-1.1	4.2	7.0	2.0	NE	26.89	0.89	0.00
9	5.7	10.9	-0.1	5.1	9.4	2.1	SSE	17.35	0.82	0.00
10	1.5	3.6	0.4	9.5	15.4	3.9	NW	5.57	0.39	0.00
11	1.5	1.8	1.1	10.9	18.4	2.2	NNW	4.61	0.22	0.00
12	1.3	5.2	-0.2	4.4	8.8	2.1	ENE	24.44	1.05	0.00
13	1.3	4.3	-0.5	4.3	6.6	2.0	NNW	18.74	1.03	0.00
14	2.4	5.3	0.3	5.1	8.5	2.1	ENE	19.70	1.02	0.00
15	1.9	4.5	0.7	4.2	8.3	2.1	NE	8.43	1.01	0.00
16	2.0	3.8	1.0	4.5	7.2	2.3	ESE	5.49	0.28	0.00
17	2.1	3.1	0.2	3.3	5.1	2.0	NNE	20.61	1.00	0.00
18	5.0	7.8	-0.3	4.8	7.1	2.0	ENE	28.95	0.98	0.00
19	8.5	16.4	4.2	4.7	11.0	2.0	SSW	23.12	0.93	0.00
20	8.9	13.1	6.3	4.5	10.2	2.0	SSW	21.16	0.93	0.00
21	11.1	15.7	7.7	4.8	8.8	2.0	SSW	7.28	0.42	0.00
22	15.4	21.3	11.2	7.8	13.9	2.4	S	17.76	1.10	0.00
23	11.1	13.9	7.0	5.1	11.3	2.0	ESE	6.85	0.33	0.00
24	6.3	7.7	5.6	4.8	6.8	2.3	NW	12.27	0.82	0.00
25	5.5	7.0	4.9	5.6	8.5	2.0	NW	9.38	0.47	0.00
26	11.4	19.1	5.8	5.7	12.1	2.0	S	26.57	0.92	0.00
27	10.5	12.7	8.9	4.3	9.9	2.1	SSW	16.09	1.00	0.00
28	12.5	18.3	8.4	4.1	7.3	2.0	ENE	24.30	0.99	0.00
29	17.6	25.2	11.6	3.6	6.7	2.0	S	26.01	0.96	0.00
30	19.7	27.4	11.9	5.6	13.2	2.1	WSW	26.11	0.97	0.00
31	9.5	23.5	3.1	5.2	16.2	2.1	NNE	21.51	1.09	0.00

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1	0	1	9	49	19	11	0	4	4	0	1	1	0	0	0	0	99
2	0	0	0	0	2	11	45	45	34	6	0	0	0	0	0	0	143
3	13	1	0	0	0	8	44	32	13	0	0	0	0	1	0	6	118
4	15	0	0	0	3	2	6	1	0	0	0	0	0	10	38	37	112
5	55	25	2	0	0	0	0	0	0	0	1	0	0	1	1	53	138
6	48	7	0	0	0	0	0	0	0	0	0	0	0	0	0	89	144
7	4	0	0	0	0	0	0	0	1	2	1	0	0	2	15	74	99
8	0	14	34	18	5	10	3	0	1	0	0	0	0	0	0	0	85
9	0	0	0	0	1	8	27	47	31	12	1	0	0	0	0	0	127
10	0	0	36	23	8	7	4	0	0	0	0	1	4	3	56	1	143
11	4	1	0	0	0	0	0	0	0	0	0	0	0	1	54	64	124
12	2	2	20	26	10	10	2	2	0	1	0	0	0	0	0	0	75
13	14	15	9	0	0	0	0	0	0	1	0	0	0	0	12	30	81
14	18	12	19	41	14	6	1	0	0	0	0	0	0	0	2	8	121
15	13	16	31	3	4	10	4	2	1	3	2	0	0	0	1	8	98
16	2	3	19	5	23	39	15	14	19	0	0	0	0	0	0	0	139
17	11	40	36	19	3	1	0	0	0	3	3	0	0	0	0	0	116
18	0	8	14	32	8	14	2	3	7	2	0	1	0	0	0	0	91
19	1	0	0	1	2	3	1	2	17	34	8	3	4	16	15	2	109
20	8	6	10	2	0	0	0	0	2	29	13	5	1	3	13	4	96
21	2	2	1	0	0	1	2	2	20	30	11	0	2	2	0	0	75
22	0	0	0	0	0	0	1	10	88	40	3	0	0	0	0	0	142
23	0	0	1	12	13	45	10	11	35	8	0	0	0	0	0	0	135
24	3	0	5	7	1	0	0	0	0	0	0	0	3	45	47	24	135
25	0	0	0	0	0	0	0	0	0	0	0	0	2	23	99	2	126
26	1	4	15	19	13	14	6	7	20	20	1	0	0	0	0	0	120
27	4	9	8	1	0	0	0	0	5	22	6	0	3	8	16	1	83
28	2	0	21	22	4	3	1	3	3	0	0	0	5	7	2	0	73
29	0	4	23	15	1	5	2	13	30	11	1	3	0	0	0	0	108
30	2	7	3	1	0	5	5	4	18	15	7	25	12	3	1	0	108
31	12	30	25	14	15	1	0	0	0	2	1	3	7	0	4	13	127
Total	234	207	341	310	149	214	181	202	349	241	60	42	43	125	376	416	3490

June 1996 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1	7.2	10.3	2.7	5.1	8.0	2.0	NE	30.03	1.09	0.00
2	11.6	15.0	5.4	3.8	9.3	2.1	S	10.14	0.97	0.00
3	13.8	17.0	10.3	4.2	10.2	2.0	ESE	9.01	0.88	0.00
4	12.0	16.7	7.6	4.0	8.2	2.0	NNE	11.92	1.01	0.00
5	6.7	7.8	4.7	3.3	5.7	2.0	NNW	7.09	0.51	0.00
6										
7										
8	16.2	24.0	10.0	7.6	14.8	2.2	S	25.61	1.07	0.00
9	12.3	15.0	8.0	3.0	5.3	2.0	NW	28.38	1.16	0.00
10	9.7	12.7	7.5	3.4	5.6	2.0	NE	28.48	1.00	0.00
11	8.6	9.5	7.6	4.4	7.1	2.1	NW	12.93	0.67	0.00
12	9.3	10.2	8.4	5.8	8.3	2.1	NW	6.57	0.28	0.00
13	9.7	10.6	9.2	5.0	7.6	2.0	NW	11.90	0.67	0.00
14	12.9	14.7	10.4	4.2	7.0	2.0	ENE	23.55	1.12	0.00
15	18.1	25.4	13.4	5.2	9.5	2.0	S	25.75	1.00	0.00
16	15.8	20.3	13.6	4.4	10.3	2.0	S	12.68	0.71	0.00
17	14.4	17.0	13.1	3.4	5.9	2.0	WNW	14.89	1.00	0.00
18	15.3	19.9	11.7	4.5	8.4	2.0	S	16.57	0.94	0.00
19	10.3	11.8	9.7	6.4	10.3	2.1	NW	7.02	0.54	0.00
20	9.7	10.2	8.8	5.4	10.0	2.1	NW	6.50	0.39	0.00
21	10.3	12.0	9.2	3.0	4.1	2.0	NE	12.89	0.83	0.00
22	10.5	11.2	9.8	3.7	5.9	2.0	NE	10.98	0.46	0.00
23	10.5	11.4	9.9	2.6	3.7	2.0	NNW	13.14	0.70	0.00
24	11.5	13.9	9.7	4.3	9.2	2.0	NE	24.62	1.00	0.00
25	14.6	18.7	11.4	3.4	7.0	2.0	SSE	9.86	0.62	0.00
26	18.9	24.7	15.5	6.8	12.5	2.0	S	27.22	0.98	0.00
27	20.1	26.3	14.7	6.0	11.7	2.0	SSW	23.83	1.11	0.00
28	15.1	18.0	11.8	4.6	8.2	2.0	ENE	15.11	0.53	0.00
29	11.4	13.8	10.0	5.6	9.2	2.0	NW	4.62	0.19	0.00
30	11.4	13.1	10.0	4.5	9.5	2.1	E	6.97	0.28	0.00

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1	1	0	29	28	0	0	2	6	3	0	0	0	0	0	0	1	70
2	0	0	16	17	4	13	6	6	19	6	1	0	0	0	0	0	88
3	5	1	0	0	3	18	6	8	7	11	2	2	5	9	5	3	85
4	6	12	10	10	7	5	5	7	10	4	7	4	4	8	5	5	109
5	26	13	2	0	0	0	0	0	0	7	3	1	0	1	25	30	108
6																	
7																	
8	0	0	0	1	0	1	1	7	79	37	3	2	1	3	2	1	138
9	7	11	4	0	0	0	5	2	7	1	7	2	3	7	28	15	99
10	6	16	23	0	0	2	1	0	0	0	0	2	2	7	8	3	70
11	7	5	5	3	0	0	1	0	0	0	0	0	2	13	54	22	112
12	0	0	0	0	0	0	0	1	2	0	0	0	4	20	88	22	137
13	3	4	0	0	0	0	0	0	0	0	0	0	0	11	76	13	107
14	0	2	25	27	1	5	2	1	0	0	0	0	0	0	0	0	63
15	0	0	0	0	1	3	6	37	63	12	1	1	0	0	0	1	125
16	0	0	0	2	1	6	18	38	42	6	2	0	0	0	0	0	115
17	3	0	1	0	0	4	10	14	12	5	2	0	3	29	12	3	98
18	0	0	4	3	11	22	11	25	34	2	0	0	0	0	0	0	112
19	0	2	8	22	8	2	0	0	0	0	0	0	0	14	77	5	138
20	1	9	3	0	0	0	0	0	0	0	0	0	2	6	52	41	114
21	3	20	25	3	0	0	0	0	0	0	0	0	0	0	0	0	51
22	4	6	36	22	15	4	0	0	0	0	0	0	0	1	14	10	112
23	12	3	2	0	0	0	0	0	0	0	0	0	0	1	21	28	67
24	10	12	28	5	1	0	0	0	0	0	0	0	0	3	10	11	80
25	3	2	1	0	1	2	9	29	15	5	2	0	2	13	3	10	97
26	0	0	1	1	0	1	2	13	85	31	2	0	0	0	0	0	136
27	1	2	1	0	0	0	0	2	54	56	6	0	1	0	1	0	124
28	0	0	19	35	28	5	2	0	1	0	0	0	0	4	17	1	112
29	5	1	0	0	0	0	0	0	0	0	0	0	4	15	63	38	126
30	0	0	3	28	30	25	16	18	5	1	0	0	0	0	0	0	126
Total	103	121	246	207	111	118	103	214	438	184	38	14	33	165	561	263	2919

July 1996 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1	12.7	18.3	11.0	4.7	8.2	2.0	NW	20.00	1.27	0.00
2	12.5	14.2	10.9	3.1	5.2	2.0	NNE	21.57	1.06	0.00
3	13.4	15.1	12.3	2.8	4.2	2.0	NNE	19.78	1.17	0.00
4	14.3	16.6	12.6	3.5	6.0	2.0	NE	18.47	0.98	0.00
5	13.5	14.6	12.7	2.8	4.9	2.0	NE	8.74	0.47	0.00
6	11.5	13.3	9.4	5.4	9.1	2.1	N	3.11	0.11	0.00
7	10.0	11.1	8.8	4.8	8.3	2.1	N	16.81	0.75	0.00
8	14.0	21.3	10.2	4.2	8.0	2.0	NNE	28.03	1.02	0.00
9	14.4	18.3	12.2	3.3	7.3	2.0	SSW	8.95	0.37	0.00
10	13.5	14.9	12.7	3.0	5.7	2.0	N	11.32	0.57	0.00
11	13.3	14.5	12.7	5.9	12.1	2.0	NW	7.76	0.45	0.00
12	13.8	15.0	12.7	10.6	15.5	4.3	NW	5.85	0.30	0.00
13	18.3	24.7	13.8	3.8	5.8	2.1	WNW	20.58	1.00	0.00
14	19.6	24.6	14.3	3.4	5.6	2.1	ENE	21.83	0.75	0.00
15	18.8	20.7	16.7	2.7	4.4	2.0	NE	15.46	0.95	0.00
16	18.1	20.1	16.2	3.5	6.0	2.0	NE	19.35	0.90	0.00
17	20.6	27.1	15.8	4.8	8.0	2.0	WNW	13.34	1.11	0.00
18	14.0	16.4	13.3	5.8	8.6	3.2	NW	5.22	0.21	0.00
19	14.0	15.2	13.2	3.6	6.3	2.0	NNW	12.81	0.70	0.00
20	13.9	14.8	13.0	2.8	4.2	2.0	NNE, NE	11.84	0.78	0.00
21	14.2	14.8	13.1	2.8	4.1	2.0	NE	8.52	0.50	0.00
22	18.4	24.1	14.6	4.0	8.1	2.0	S	16.16	1.01	0.00
23	19.4	26.2	15.3	4.6	8.7	2.1	S	28.90	0.98	0.00
24	20.2	24.8	15.7	6.5	11.2	3.3	S	24.03	0.99	0.00
25	21.1	24.1	18.4	7.2	12.0	2.5	SSW	14.58	0.70	0.00
26	20.7	22.1	18.9	3.8	9.4	2.0	SSW	3.64	0.20	0.00
27	20.6	24.4	18.7	2.9	6.7	2.0	NE	11.18	0.57	0.00
28	19.3	20.9	18.2	3.5	5.5	2.0	ENE	13.76	0.79	0.00
29	22.6	27.5	18.6	3.9	9.7	2.0	NE	22.84	0.99	0.00
30	21.2	29.2	15.5	4.5	8.8	2.0	SSW	6.24	0.42	0.00
31	15.3	16.2	14.5	3.3	6.3	2.0	NNW	11.88	0.65	0.00

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1	4	0	13	16	1	4	9	21	19	3	0	1	1	6	28	7	133
2	9	24	1	0	0	0	0	0	0	0	0	0	0	8	22	23	87
3	4	29	10	1	0	0	0	0	0	0	0	0	0	0	0	7	51
4	0	9	36	8	0	0	0	0	0	0	0	0	0	5	19	10	87
5	12	18	24	4	1	0	0	0	0	0	0	0	0	1	9	8	77
6	43	11	20	4	3	0	0	0	0	0	0	0	0	0	1	37	119
7	43	15	20	19	12	14	8	0	0	0	0	0	0	0	0	5	136
8	4	28	13	7	0	0	0	0	14	21	9	1	1	0	0	0	98
9	2	1	0	0	0	0	0	0	6	23	9	1	3	14	6	3	68
10	19	4	3	1	0	0	0	0	0	0	0	0	0	11	13	14	65
11	6	9	5	0	1	0	0	1	0	0	0	0	0	11	39	12	84
12	1	0	0	0	0	0	0	0	0	0	0	0	0	18	109	16	144
13	0	0	8	5	1	0	2	1	0	0	2	0	19	53	5	4	100
14	0	1	16	17	3	1	6	0	0	0	0	1	2	6	2	1	56
15	2	8	11	6	1	1	1	0	0	3	2	1	1	2	0	3	42
16	1	10	18	13	0	1	0	0	0	0	0	0	1	5	11	7	67
17	0	0	0	0	0	1	4	22	24	12	3	1	5	34	8	0	114
18	0	0	0	0	0	0	0	0	0	0	0	0	0	28	97	19	144
19	9	14	22	4	1	0	0	0	0	0	0	0	0	1	17	43	111
20	11	26	26	14	2	1	2	0	0	0	0	0	0	0	3	15	100
21	0	3	37	32	8	2	0	0	0	0	0	0	0	0	0	0	82
22	0	0	0	0	1	1	3	21	41	26	6	0	0	2	0	0	101
23	0	0	6	0	0	0	2	22	56	36	6	0	1	4	2	0	135
24	0	0	0	0	0	0	0	3	70	63	8	0	0	0	0	0	144
25	0	0	0	0	0	0	0	0	60	78	6	0	0	0	0	0	144
26	0	0	6	9	6	6	8	3	20	25	2	1	0	0	0	0	86
27	1	2	8	3	3	1	4	2	6	3	1	2	2	5	4	0	47
28	0	1	12	39	35	9	0	0	0	0	0	1	1	0	0	0	98
29	1	2	22	14	2	2	2	0	12	10	6	7	4	0	1	1	86
30	5	16	12	5	4	6	1	1	18	33	3	8	1	0	3	3	119
31	20	18	10	10	2	3	1	1	0	0	0	0	0	0	12	25	102
Total	197	249	359	231	87	53	53	98	346	336	63	25	42	214	411	263	3027

August 1996 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1	14.9	15.7	14.2	3.4	5.7	2.1	N	10.09	0.71	0.00
2	14.8	16.0	14.0	4.0	7.2	2.0	ENE	10.45	0.66	0.00
3	16.2	20.4	14.2	7.9	16.2	2.0	S	11.69	0.86	0.00
4	18.0	26.2	14.2	8.0	15.8	2.0	S	11.32	1.20	0.00
5										
6										
7	16.3	17.9	13.8	4.3	7.0	2.1	NE	23.96	0.95	0.00
8	19.7	23.1	16.2	8.0	15.2	2.2	S	15.51	0.94	0.00
9	20.0	23.4	17.5	7.2	15.5	2.1	S	20.44	1.03	0.00
10	23.7	29.0	18.5	6.8	13.0	2.3	S	27.58	0.94	0.00
11	21.9	24.6	19.5	4.8	8.9	2.0	SSW	9.94	0.53	0.00
12	21.3	25.4	18.9	3.9	8.6	2.0	S	12.91	0.67	0.00
13	21.1	22.7	18.9	3.7	6.2	2.0	NE	23.94	1.02	0.00
14	21.5	25.8	19.1	3.5	6.1	2.0	NE	25.25	0.88	0.00
15	23.2	27.5	18.9	4.0	7.8	2.0	SE	11.84	0.78	0.00
16	16.7	19.3	15.0	6.4	9.4	2.1	NNW	4.32	0.21	0.00
17	15.8	18.5	14.0	4.2	6.6	2.1	ENE	21.09	1.12	0.00
18	18.7	24.1	16.5	5.3	10.8	2.0	NW	11.96	1.05	0.00
19	19.5	26.4	16.0	5.3	12.9	2.0	SSW	20.39	0.97	0.00
20	22.9	27.6	19.4	6.3	12.1	2.2	S	23.54	0.89	0.00
21	23.0	28.1	19.6	4.6	9.3	2.0	S	22.08	1.09	0.00
22	20.4	21.9	19.5	3.3	6.1	2.0	SSW	4.29	0.34	0.00
23	17.3	19.4	14.5	6.4	12.5	2.0	NW	2.34	0.22	0.00
24	14.8	17.5	11.1	4.1	6.1	2.0	N	15.51	0.74	0.00
25	15.5	19.2	11.0	2.9	4.9	2.0	SSW	26.25	0.92	0.00
26	18.0	21.9	12.9	2.6	5.1	2.0	NE	24.34	0.92	0.00
27	18.5	21.5	15.3	3.2	5.2	2.0	NE	23.92	0.92	0.00
28	18.0	20.9	14.0	4.7	9.3	2.0	NE	25.15	0.89	0.00
29	17.2	19.6	14.7	4.4	8.8	2.1	SSE	9.68	0.52	0.00
30	18.1	20.6	15.0	2.8	5.8	2.0	NE	23.70	0.87	0.00
31	18.9	23.6	14.8	3.2	6.0	2.0	SSW	17.36	1.07	0.00

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1	40	11	7	2	2	0	2	2	2	0	0	0	0	0	6	32	106
2	0	0	13	41	25	15	15	2	5	1	0	0	0	0	0	0	117
3	0	0	0	0	0	1	1	5	77	49	6	0	0	0	0	0	139
4	3	0	2	4	4	0	1	4	42	26	1	2	1	7	6	25	128
5																	
6																	
7	0	0	40	24	3	4	5	3	1	0	2	0	0	0	0	0	82
8	0	0	0	0	1	0	3	34	75	27	1	0	0	0	0	0	141
9	0	0	0	0	0	0	6	47	75	14	1	0	0	0	0	0	143
10	0	0	0	0	0	0	6	36	57	44	0	0	0	0	0	0	143
11	0	0	0	0	0	0	1	7	38	61	13	3	2	0	1	0	126
12	0	0	0	0	0	0	2	13	41	36	12	2	1	2	4	1	114
13	1	3	28	15	1	3	0	0	0	0	1	0	1	4	4	2	63
14	4	3	34	6	2	2	1	0	0	0	0	0	0	0	1	5	58
15	0	3	9	7	11	13	32	14	17	2	0	3	0	1	1	0	113
16	28	4	0	0	0	0	0	0	0	0	0	0	0	0	12	100	144
17	20	12	29	32	8	18	0	0	0	2	0	0	0	0	0	13	134
18	3	0	0	0	0	0	0	1	13	31	11	2	2	2	39	24	128
19	12	2	6	15	4	1	2	2	21	23	0	0	1	4	6	14	113
20	0	0	0	0	0	0	0	12	75	54	3	0	0	0	0	0	144
21	1	2	1	1	0	1	10	35	46	8	0	2	7	3	4	1	122
22	0	0	1	10	6	6	5	9	14	16	3	0	1	0	0	0	71
23	6	6	6	5	0	4	1	1	0	0	0	0	3	14	23	18	87
24	43	8	0	0	2	3	1	1	0	5	0	0	0	0	7	29	99
25	14	5	1	3	3	1	0	1	8	27	5	0	0	5	9	11	93
26	0	1	19	10	2	0	0	4	16	6	1	0	0	1	3	0	63
27	0	4	26	23	2	1	0	0	5	17	2	0	0	0	0	0	80
28	0	6	26	24	3	4	2	6	24	10	6	0	0	0	0	0	111
29	0	0	0	0	0	0	15	66	55	3	0	0	0	0	0	0	139
30	5	7	23	5	0	1	0	4	13	11	2	1	0	0	0	6	78
31	0	1	19	4	6	12	4	5	6	34	12	2	0	0	0	0	105
Total	180	78	290	231	85	90	115	314	726	507	82	17	19	43	126	281	3184

September 1996 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1	16.4	18.7	13.9	3.7	7.8	2.0	SSW	3.42	0.24	0.00
2	15.4	16.5	13.6	4.7	8.4	2.0	ENE	5.47	0.38	0.00
3	15.8	16.7	14.7	4.2	6.9	2.1	N	8.58	0.45	0.00
4	15.2	16.6	11.9	4.9	10.7	2.0	NE	20.76	0.98	0.00
5	14.1	17.8	12.0	5.4	10.3	2.0	S	6.22	1.10	0.00
6	14.8	17.0	10.4	7.6	14.1	2.0	WNW	16.50	1.06	0.00
7	13.4	16.9	9.3	4.3	8.3	2.0	ENE	22.20	0.90	0.00
8	14.7	19.0	12.0	3.3	6.5	2.0	NNW	16.72	1.00	0.00
9	16.8	21.0	11.6	7.8	14.7	2.0	S	17.53	0.82	0.00
10	17.6	21.3	15.9	7.5	12.0	3.4	S	12.77	0.99	0.00
11	16.3	20.7	12.8	5.1	10.9	2.0	SSW	11.10	1.05	0.00
12	14.8	18.4	9.5	3.1	6.6	2.0	SW	22.32	0.84	0.00
13	16.2	20.0	10.5	4.6	9.5	2.0	ENE	20.63	0.79	0.00
14	19.0	24.5	14.0	4.9	9.8	2.1	SSW	20.82	0.80	0.00
15	19.4	24.3	16.3	4.2	7.1	2.1	SSE	16.23	0.89	0.00
16	17.7	21.0	15.1	7.9	13.0	3.8	S	16.47	0.87	0.00
17	18.0	21.0	16.3	4.8	9.4	2.0	SSW	11.46	0.87	0.00
18	18.7	21.6	16.6	4.1	7.3	2.1	SSE	9.71	0.53	0.00
19	18.8	22.0	16.4	4.0	8.2	2.0	SSE	13.14	0.84	0.00
20	18.6	21.8	15.7	7.0	13.5	2.7	S	12.24	0.90	0.00
21	16.4	21.0	12.7	4.6	9.8	2.0	SSE	6.50	0.99	0.00
22	15.2	17.6	12.0	4.5	7.5	2.0	ESE	14.48	0.80	0.00
23	14.6	15.9	13.2	7.8	12.3	2.1	NE	5.34	0.32	0.00
24	15.8	19.0	13.2	5.2	12.0	2.0	WNW	17.36	0.88	0.00
25	17.4	23.3	14.1	4.4	10.5	2.0	SSW	11.39	0.77	0.00
26	16.0	18.8	10.5	5.6	11.2	2.0	SSW	7.39	0.70	0.00
27	12.0	14.6	8.2	6.6	13.8	2.0	NNW	11.12	1.02	0.00
28	14.6	16.9	12.2	9.4	14.6	5.1	WNW	19.76	0.85	0.00
29	13.4	15.4	9.5	5.2	10.5	2.0	NNW	18.54	0.75	0.00
30										

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1	0	0	0	0	5	23	16	24	17	31	8	0	0	0	0	0	124
2	4	18	23	33	2	2	3	7	1	0	1	0	0	0	0	0	94
3	49	33	3	0	0	0	0	0	1	3	2	0	2	2	0	18	113
4	16	22	32	16	8	8	4	9	6	2	0	0	1	2	0	0	126
5	0	0	0	0	0	4	22	41	50	18	1	1	0	0	0	0	137
6	13	0	0	0	0	0	0	0	0	10	8	3	8	37	32	28	139
7	0	0	2	27	23	7	4	2	25	24	2	0	0	0	0	0	116
8	5	3	0	1	0	0	0	2	6	8	1	0	1	4	6	13	50
9	0	0	0	0	0	1	8	7	71	31	4	0	0	0	0	0	122
10	0	0	0	0	0	0	0	4	92	41	2	0	1	1	0	0	141
11	4	5	4	0	0	0	1	4	47	48	3	2	2	2	3	0	125
12	6	5	3	9	6	1	2	0	0	10	11	0	4	10	1	8	76
13	0	0	13	30	10	2	6	4	2	14	4	1	0	1	0	0	87
14	0	0	0	1	0	0	1	16	53	61	7	0	0	0	0	0	139
15	0	0	0	0	1	0	4	75	49	2	1	0	0	0	0	0	132
16	0	0	0	0	0	0	0	13	74	55	2	0	0	0	0	0	144
17	0	6	10	7	7	2	0	0	26	28	2	0	4	0	2	0	94
18	0	0	0	0	4	28	29	30	20	5	0	0	0	0	0	0	116
19	0	2	3	0	3	5	11	46	39	10	1	0	0	0	0	0	120
20	0	0	0	0	0	0	6	63	66	8	1	0	0	0	0	0	144
21	1	2	0	0	7	13	13	34	19	5	1	0	0	1	3	4	103
22	0	0	5	17	11	20	5	0	6	7	0	0	0	0	0	0	71
23	15	10	32	27	11	7	3	2	2	0	0	0	0	0	1	12	122
24	0	2	10	9	5	2	3	2	4	13	1	1	16	31	11	8	118
25	0	0	3	4	3	5	6	5	24	33	7	3	3	1	1	1	99
26	5	0	0	0	0	0	0	1	12	33	15	5	5	27	18	12	133
27	2	0	0	0	0	0	0	2	10	21	7	0	11	31	22	33	139
28	7	0	0	0	0	0	0	0	0	0	0	0	31	44	20	42	144
29	8	8	3	3	0	0	0	1	7	15	2	0	2	16	23	30	118
30																	
Total	135	116	146	184	106	130	147	394	729	536	94	16	91	210	143	209	3386

October 1996 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1										
2	12.3	13.6	8.9	5.0	8.8	2.1	NE	13.83	0.91	0.00
3	13.0	18.5	8.2	5.1	11.6	2.1	SSW	13.17	0.69	0.00
4	13.9	16.4	11.7	8.4	15.8	2.1	S	3.04	0.27	0.00
5	10.4	12.5	7.3	4.4	10.0	2.0	WNW	17.93	0.82	0.00
6	11.3	15.4	7.1	4.2	8.9	2.1	S	10.41	0.64	0.00
7	13.3	17.0	9.0	8.1	15.4	2.2	S, SSW	2.43	0.14	0.00
8	11.6	16.0	6.6	5.4	10.9	2.0	SSW	17.01	0.77	0.00
9	11.1	15.2	6.4	5.4	12.8	2.0	WSW	12.72	0.91	0.00
10	10.6	13.5	7.8	4.4	8.4	2.0	W	5.37	0.58	0.00
11	10.3	14.3	6.0	3.2	6.5	2.0	S	16.96	0.81	0.00
12	12.8	19.4	7.0	4.7	7.6	2.0	SSW	14.26	0.76	0.00
13	11.8	15.0	8.1	3.1	5.2	2.0	SSW	14.28	0.63	0.00
14	12.6	18.5	7.9	5.9	12.8	2.1	SSW	12.89	0.68	0.00
15	12.0	15.1	9.6	6.5	13.2	2.4	S	6.03	0.54	0.00
16	8.0	10.8	4.6	6.0	12.5	2.9	W	10.00	0.83	0.00
17	7.4	10.8	4.5	7.6	14.5	2.0	W	15.06	0.83	0.00
18	9.3	11.5	5.5	4.4	8.3	2.1	E	9.65	0.53	0.00
19	8.5	9.1	7.8	5.2	11.4	2.1	NNE	4.25	0.62	0.00
20	8.0	8.9	6.5	7.9	11.5	3.0	N	7.77	0.73	0.00
21	8.5	12.8	3.3	4.9	10.0	2.0	WNW	11.79	0.85	0.00
22	9.0	14.0	4.3	4.9	12.9	2.0	SSW	12.38	0.61	0.00
23	9.6	15.2	4.0	5.3	11.2	2.1	S	14.19	0.64	0.00
24	13.1	17.5	9.4	5.8	10.2	2.0	SSW	8.67	0.56	0.00
25	12.0	16.2	10.3	5.5	10.5	2.1	NW	4.01	0.29	0.00
26	7.4	10.7	4.0	8.5	21.9	2.0	W	3.03	0.19	0.00
27	3.7	6.3	1.6	9.6	21.1	2.2	WNW	11.24	0.75	0.00
28	10.1	15.0	2.8	8.3	12.9	2.1	S	12.28	0.57	0.00
29	14.0	18.9	10.7	5.3	12.6	2.0	S	8.70	0.74	0.00
30	12.6	22.5	6.8	8.8	17.1	2.5	S	7.25	0.54	0.00
31	3.5	6.7	-1.7	7.5	15.7	2.1	NW	6.39	0.42	0.00

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1																	
2	0	11	61	19	10	6	0	3	7	6	0	0	0	0	0	0	123
3	0	0	0	0	0	0	4	16	44	60	10	1	0	0	0	0	135
4	0	0	0	0	0	0	10	6	30	26	2	0	5	16	22	8	125
5	5	5	6	5	8	5	0	0	8	10	6	6	7	27	10	6	114
6	0	0	0	0	0	0	2	24	53	52	6	0	0	0	0	0	137
7	1	0	0	0	0	1	2	5	35	35	20	10	7	14	3	6	139
8	0	0	0	0	0	0	0	3	21	31	26	23	22	13	0	0	139
9	0	0	0	0	0	0	2	3	15	20	19	39	24	4	0	4	130
10	4	1	0	0	0	0	1	5	18	17	25	24	27	5	1	0	128
11	0	0	0	6	0	2	8	2	23	15	14	15	4	6	0	0	95
12	0	0	0	0	0	0	2	4	44	74	8	0	0	0	0	0	132
13	0	2	8	21	5	4	3	2	8	29	4	0	0	0	0	0	86
14	0	0	0	0	0	0	0	4	53	62	21	1	0	0	0	0	141
15	29	14	1	1	2	2	3	3	42	11	2	1	0	0	4	9	124
16	6	1	0	0	0	0	0	0	1	5	14	36	44	24	6	6	143
17	0	0	0	0	0	0	0	2	5	3	18	33	55	10	0	0	126
18	0	0	0	9	34	19	10	6	8	7	3	1	2	3	7	5	114
19	29	46	26	5	0	4	0	0	0	0	0	0	2	6	1	19	138
20	56	4	0	0	0	0	0	0	0	0	0	2	10	26	9	37	144
21	0	0	1	1	1	4	1	1	9	14	4	7	14	42	9	11	119
22	8	14	15	0	0	0	0	3	23	28	4	2	4	3	5	21	130
23	0	0	0	0	0	3	6	16	58	39	0	0	0	0	0	0	122
24	0	0	0	0	0	0	0	0	50	67	13	0	0	0	0	0	130
25	3	1	0	0	0	0	0	0	13	28	6	4	3	4	29	16	107
26	14	4	0	1	7	6	2	0	0	0	1	5	26	24	22	19	131
27	0	0	0	0	1	1	0	1	19	16	5	11	24	30	25	8	141
28	0	0	1	1	1	9	17	24	70	20	1	0	0	0	0	0	144
29	2	2	0	1	1	8	14	25	39	21	3	0	1	0	0	2	119
30	11	3	0	0	0	0	1	4	54	15	0	0	3	5	20	23	139
31	7	3	3	0	1	1	1	0	2	3	8	7	6	17	54	27	140
Total	175	111	122	70	71	75	89	162	752	714	243	228	290	279	227	227	3835

November 1996 Kimuaneppu, Saroma-ko Lagoon

Date	Air Temperature			Wind				Solar Radiation		
	Mean °C	Max. °C	Min. °C	Mean m/s	Max. m/s	Min. m/s	Most Freq. Dir.	Cumulative MJ/m²	Max. kW/m²	Min. kW/m²
1	3.6	7.8	-0.9	3.4	5.9	2.0	NNE	8.60	0.64	0.00
2	5.5	6.7	2.3	5.7	8.8	2.0	WNW	8.39	0.65	0.00
3	5.1	9.3	0.6	3.5	7.4	2.0	S	10.34	0.58	0.00
4	8.0	12.1	3.3	3.9	9.1	2.0	WSW	7.67	0.58	0.00
5	11.5	14.8	8.2	8.3	11.6	3.7	S	3.13	0.29	0.00
6	6.8	13.6	0.0	12.1	21.4	2.3	NNW	2.33	0.41	0.00
7	3.2	5.7	0.3	6.6	14.9	2.0	WSW	9.85	0.68	0.00
8	4.0	7.2	0.6	4.8	10.5	2.0	NW	11.43	0.53	0.00
9	4.5	7.8	0.8	5.2	15.6	2.0	S	2.97	0.24	0.00
10	5.6	8.8	1.6	5.2	11.5	2.0	NNW	7.81	0.53	0.00
11	4.2	6.9	2.2	6.5	13.9	2.0	ESE	8.70	0.50	0.00
12	-1.1	2.2	-4.0	9.9	14.7	6.2	WNW	3.48	0.29	0.00
13	-4.5	-3.1	-7.5	8.0	14.3	2.2	WNW	5.63	0.62	0.00
14	-1.0	3.8	-7.3	4.6	10.6	2.0	NE	6.16	0.48	0.00
15	0.2	2.2	-2.5	7.6	13.1	2.2	WNW	8.02	0.64	0.00
16	0.7	2.8	-2.7	7.7	18.7	2.2	W	6.19	0.54	0.00
17	3.6	7.9	-1.6	3.4	10.6	2.0	S	7.42	0.52	0.00
18	2.3	3.6	0.6	4.3	8.8	2.0	WNW	4.71	0.42	0.00
19	1.1	3.1	-0.7	7.2	15.7	2.0	WNW	7.38	0.61	0.00
20	2.0	5.6	-1.8	4.0	10.6	2.1	SSE, WNW	9.46	0.50	0.00
21	6.0	9.9	0.8	5.7	10.8	2.2	S	5.53	0.54	0.00
22	4.1	7.6	-0.2	7.0	15.8	2.2	WSW, W	9.61	0.65	0.00
23	3.1	4.4	-1.3	9.7	15.9	2.2	WNW	8.64	0.51	0.00
24	1.9	5.7	-1.3	2.9	5.9	2.0	SSW	8.82	0.48	0.00
25	4.1	6.3	1.9	6.8	17.4	2.0	WNW	2.83	0.24	0.00
26	2.6	3.9	-0.1	6.5	15.3	2.0	NW	6.23	0.62	0.00
27	2.8	5.0	-0.3	5.1	10.1	2.1	SSE	4.78	0.34	0.00
28										
29										
30										

Frequency of Wind Direction

Date	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1	0	14	10	8	7	13	9	8	7	5	4	0	0	1	9	2	97
2	30	16	3	2	0	0	0	0	1	1	0	0	1	45	9	8	116
3	2	8	3	6	3	4	4	3	17	10	9	4	12	0	2	3	90
4	0	7	6	3	3	4	4	7	3	5	14	19	15	7	8	0	105
5	0	0	0	0	3	2	9	38	80	11	1	0	0	0	0	0	144
6	1	0	0	0	0	0	1	11	15	9	2	5	5	17	30	38	134
7	0	5	1	2	1	0	0	0	0	2	16	37	24	29	3	2	122
8	3	6	1	3	1	2	1	2	4	9	14	3	1	7	38	5	100
9	0	0	2	2	0	11	24	32	37	10	1	0	0	0	0	0	119
10	11	5	13	11	4	1	3	0	2	1	4	3	2	9	6	25	100
11	4	3	3	2	8	25	13	4	1	1	0	1	7	23	16	18	129
12	14	0	0	0	0	0	0	0	0	0	0	0	2	41	37	41	135
13	0	6	0	0	2	2	0	0	2	4	7	12	29	43	31	1	139
14	0	12	18	10	6	8	4	10	6	8	13	7	13	5	5	0	125
15	0	0	0	0	0	0	0	0	0	1	14	12	23	64	23	0	137
16	0	0	0	0	0	1	0	0	3	6	13	17	61	36	0	0	137
17	1	11	7	7	4	4	10	12	13	10	4	9	3	3	1	2	101
18	3	14	4	0	1	1	5	3	0	3	11	6	22	34	9	7	123
19	0	9	5	0	0	0	0	0	3	1	3	2	31	58	19	6	137
20	2	3	5	2	0	3	7	19	16	10	2	2	14	19	8	1	113
21	0	0	0	4	4	2	12	49	50	7	1	0	0	0	0	0	129
22	0	0	0	0	0	0	2	0	7	8	33	45	45	3	1	0	144
23	0	0	0	0	0	0	0	1	0	2	0	3	36	67	23	0	132
24	5	4	7	8	1	3	12	13	15	28	2	1	2	0	0	0	101
25	1	0	0	1	2	5	6	28	28	0	0	0	5	29	18	2	125
26	22	9	4	4	4	0	0	0	0	0	0	0	0	11	31	16	101
27	0	0	1	0	0	1	51	52	6	0	0	0	0	0	0	0	111
28																	
29																	
30																	
Total	99	132	93	75	54	92	177	292	316	152	168	188	353	551	327	177	3246