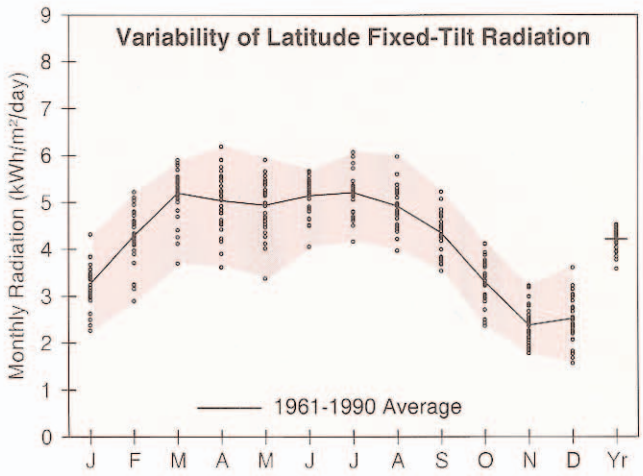
Caribou, ME

WBAN NO. 14607

LATITUDE: 46.87° N
LONGITUDE: 68.02° W
ELEVATION: 190 meters
MEAN PRESSURE: 991 millibars

STATION TYPE: Primary



Solar Radiation for Flat-Plate Collectors Facing South at a Fixed Tilt (kWh/m²/day), Uncertainty ±9%

Tilt (°)		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
0	Average	1.6	2.6	3.8	4.6	5.2	5.7	5.6	4.8	3.6	2.3	1.4	1.2	3.6
	Min/Max	1.3/1.8	1.9/2.9	3.0/4.3	3.5/5.4	3.6/6.2	4.7/6.4	4.6/6.5	4.0/5.7	3.1/4.2	1.8/2.7	1.1/1.7	0.9/1.5	3.1/3.7
Latitude -15	Average	2.9	3.9	5.0	5.1	5.3	5.6	5.6	5.2	4.3	3.1	2.2	2.2	4.2
	Min/Max	2.0/3.7	2.7/4.7	3.6/5.6	3.8/6.2	3.6/6.3	4.4/6.2	4.5/6.6	4.2/6.2	3.6/5.2	2.3/3.9	1.6/2.9	1.4/3.1	3.6/4.5
Latitude	Average	3.3	4.3	5.2	5.0	4.9	5.1	5.2	4.9	4.3	3.3	2.4	2.5	4.2
	Min/Max	2.3/4.3	2.9/5.2	3.7/5.9	3.6/6.2	3.4/5.9	4.1/5.7	4.2/6.1	4.0/6.0	3.5/5.2	2.4/4.1	1.8/3.2	1.6/3.6	3.6/4.5
Latitude +15	Average	3.5	4.5	5.2	4.7	4.4	4.5	4.6	4.5	4.1	3.3	2.5	2.7	4.0
	Min/Max	2.4/4.7	3.0/5.5	3.6/5.9	3.3/5.9	3.0/5.2	3.5/4.9	3.6/5.3	3.6/5.4	3.3/5.0	2.3/4.2	1.8/3.4	1.6/3.9	3.4/4.3
90	Average	3.4	4.2	4.6	3.7	2.9	2.8	2.9	3.0	3.2	2.8	2.3	2.7	3.2
	Min/Max	2.3/4.7	2.8/5.2	3.1/5.3	2.4/4.8	2.0/3.4	2.3/3.0	2.3/3.2	2.5/3.7	2.5/3.8	2.0/3.6	1.6/3.2	1.5/3.9	2.6/3.5

Solar Radiation for 1-Axis Tracking Flat-Plate Collectors with a North-South Axis (kWh/m²/day), Uncertainty ±9%

Axis Tilt (°)		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
0	Average	2.5	3.8	5.4	6.1	6.8	7.3	7.3	6.4	5.0	3.1	1.9	1.9	4.8
	Min/Max	1.8/3.2	2.7/4.6	3.7/6.2	4.1/7.6	4.2/8.1	5.4/8.6	5.8/9.2	5.1/7.8	3.9/5.8	2.3/4.0	1.5/2.6	1.1/2.6	4.0/5.1
Latitude -15	Average	3.4	4.8	6.3	6.6	7.0	7.4	7.4	6.7	5.5	3.8	2.5	2.6	5.3
	Min/Max	2.4/4.6	3.3/5.9	4.3/7.3	4.4/8.3	4.2/8.3	5.4/8.6	5.8/9.4	5.4/8.3	4.3/6.7	2.7/4.8	1.9/3.5	1.5/3.8	4.4/5.7
Latitude	Average	3.7	5.1	6.5	6.5	6.7	7.1	7.2	6.6	5.6	3.9	2.7	2.8	5.4
	Min/Max	2.6/5.1	3.4/6.4	4.3/7.5	4.3/8.3	4.1/8.1	5.1/8.3	5.6/9.1	5.2/8.2	4.3/6.7	2.8/5.1	2.0/3.8	1.7/4.2	4.4/5.8
Latitude +15	Average	3.9	5.2	6.5	6.3	6.3	6.6	6.7	6.3	5.4	3.9	2.8	3.0	5.2
	Min/Max	2.7/5.4	3.5/6.5	4.3/7.5	4.1/8.1	3.8/7.6	4.8/7.8	5.3/8.6	5.0/7.8	4.2/6.5	2.8/5.1	2.0/3.9	1.7/4.4	4.2/5.7

Solar Radiation for 2-Axis Tracking Flat-Plate Collectors (kWh/m²/day), Uncertainty ±9%

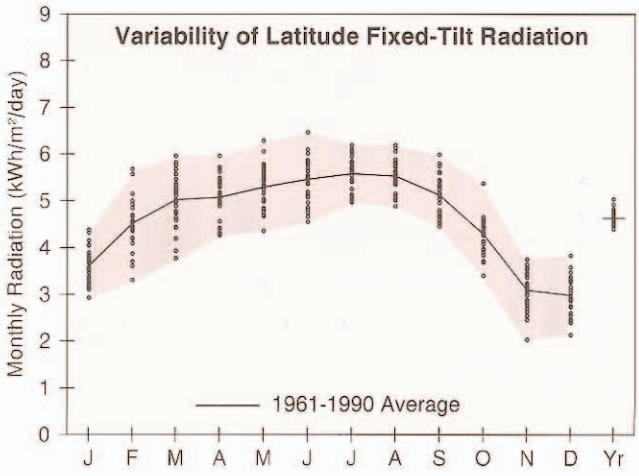
Tracker		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
2-Axis	Average	4.0	5.2	6.5	6.6	7.1	7.6	7.6	6.8	5.6	4.0	2.8	3.0	5.6
	Min/Max	2.7/5.4	3.5/6.5	4.3/7.5	4.4/8.3	4.3/8.4	5.6/8.9	6.0/9.6	5.4/8.4	4.3/6.7	2.8/5.1	2.0/3.9	1.7/4.5	4.5/6.0

Direct Beam Solar Radiation for Concentrating Collectors (kWh/m²/day), Uncertainty ±8%

Tracker		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
1-Axis, E-W Horiz Axis	Average	2.1	2.5	2.7	2.6	2.9	3.2	3.2	2.9	2.5	1.9	1.4	1.6	2.5
	Min/Max	1.1/3.5	1.4/3.6	1.5/3.7	1.4/3.6	1.5/4.0	1.7/4.1	2.4/4.7	2.2/4.1	1.7/3.4	1.0/2.8	0.8/2.5	0.8/2.7	1.9/2.8
1-Axis, N-S Horiz Axis	Average	1.3	2.1	2.9	3.3	3.9	4.2	4.3	3.8	3.0	1.8	0.9	0.9	2.7
	Min/Max	0.7/2.2	1.1/2.9	1.5/4.0	1.7/4.5	1.8/5.4	2.3/5.5	3.2/6.4	2.9/5.3	2.0/4.0	0.9/2.7	0.5/1.8	0.4/1.6	2.0/3.0
1-Axis, N-S Tilt=Latitude	Average	2.3	3.0	3.7	3.6	3.9	4.0	4.2	4.0	3.5	2.4	1.5	1.7	3.1
	Min/Max	1.3/3.7	1.6/4.3	1.9/4.9	1.9/5.0	1.8/5.4	2.2/5.3	3.1/6.2	3.1/5.6	2.3/4.7	1.3/3.6	0.9/2.8	0.8/2.9	2.3/3.5
2-Axis	Average	2.4	3.1	3.7	3.7	4.1	4.4	4.5	4.1	3.5	2.4	1.6	1.8	3.3
	Min/Max	1.3/4.0	1.7/4.4	2.0/4.9	1.9/5.1	1.9/5.7	2.3/5.8	3.3/6.7	3.2/5.8	2.3/4.7	1.3/3.7	0.9/3.0	0.9/3.1	2.4/3.7

Average Climatic Conditions

Element	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Temperature (°C)	-12.8	-11.2	-4.1	3.3	10.5	15.8	18.6	17.1	12.1	6.2	-0.7	-9.6	3.8
Daily Minimum Temp	-18.7	-17.4	-9.5	-1.7	4.5	9.5	12.5	11.2	6.2	1.3	-4.6	-14.7	-1.8
Daily Maximum Temp	-7.0	-5.0	1.3	8.2	16.5	22.2	24.7	23.1	17.8	11.1	3.1	-4.4	9.3
Record Minimum Temp	-35.6	-40.6	-28.9	-18.9	-7.8	-1.1	2.2	1.1	-5.0	-10.0	-20.6	-35.0	-40.6
Record Maximum Temp	11.1	11.1	22.8	30.0	35.6	35.6	35.0	35.0	32.8	26.1	20.0	14.4	35.6
HDD, Base 18.3°C	966	826	696	452	243	79	34	64	191	376	572	864	5362
CDD, Base 18.3°C	0	0	0	0	0	4	42	26	0	0	0	0	73
Relative Humidity (%)	72	70	69	69	66	70	75	78	78	77	80	77	73
Wind Speed (m/s)	5.1	5.0	5.3	5.1	4.8	4.4	4.1	3.8	4.2	4.5	4.7	4.9	4.6



Portland, ME

WBAN NO. 14764

LATITUDE: 43.65° N
LONGITUDE: 70.32° W
ELEVATION: 19 meters
MEAN PRESSURE: 1013 millibars

STATION TYPE: Secondary

Solar Radiation for Flat-Plate Collectors Facing South at a Fixed Tilt (kWh/m²/day), Uncertainty ±11%

Tilt (°)		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
0	Average	1.9	2.8	3.8	4.7	5.6	6.1	6.0	5.4	4.2	2.9	1.8	1.5	3.9
	Min/Max	1.7/2.2	2.2/3.3	3.1/4.5	4.1/5.4	4.6/6.6	5.2/7.2	5.4/6.7	4.8/5.9	3.9/4.8	2.5/3.5	1.4/2.0	1.2/1.8	3.7/4.2
Latitude -15	Average	3.1	4.1	4.8	5.2	5.7	6.0	6.0	5.8	5.1	4.0	2.8	2.6	4.6
	Min/Max	2.6/3.8	3.1/5.1	3.7/5.7	4.4/6.1	4.7/6.7	5.0/7.1	5.3/6.7	5.1/6.4	4.5/5.9	3.2/5.0	1.9/3.3	1.9/3.3	4.4/5.0
Latitude	Average	3.6	4.5	5.0	5.1	5.3	5.5	5.6	5.5	5.1	4.3	3.1	3.0	4.6
	Min/Max	2.9/4.4	3.3/5.7	3.8/6.0	4.3/6.0	4.4/6.3	4.6/6.5	5.0/6.2	4.9/6.2	4.4/6.0	3.4/5.4	2.0/3.8	2.1/3.8	4.4/5.0
Latitude +15	Average	3.9	4.7	5.0	4.7	4.7	4.7	4.9	5.0	4.9	4.3	3.2	3.2	4.4
	Min/Max	3.1/4.8	3.4/6.0	3.7/6.0	3.9/5.6	3.9/5.5	4.0/5.6	4.4/5.4	4.4/5.6	4.2/5.8	3.4/5.4	2.1/4.0	2.3/4.2	4.2/4.8
90	Average	3.8	4.4	4.1	3.2	2.8	2.7	2.8	3.2	3.6	3.6	2.9	3.1	3.4
	Min/Max	3.0/4.7	3.0/5.6	2.9/5.2	2.7/4.0	2.4/3.2	2.3/3.0	2.6/3.0	2.8/3.6	3.1/4.3	2.8/4.6	1.8/3.6	2.1/4.2	3.1/3.7

Solar Radiation for 1-Axis Tracking Flat-Plate Collectors with a North-South Axis (kWh/m²/day), Uncertainty ±11%

Axis Tilt (°)		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
0	Average	2.9	4.1	5.4	6.2	7.2	7.8	7.8	7.2	5.8	4.2	2.6	2.3	5.3
	Min/Max	2.4/3.5	3.0/5.1	4.0/6.4	5.1/7.5	5.7/9.0	6.1/9.7	6.4/9.0	6.3/8.2	5.0/6.8	3.3/5.3	1.7/3.1	1.6/2.9	5.0/5.8
Latitude -15	Average	3.8	5.1	6.1	6.7	7.4	7.9	7.9	7.5	6.5	5.0	3.3	3.1	5.9
	Min/Max	3.1/4.7	3.6/6.5	4.5/7.3	5.4/8.0	5.8/9.3	6.1/9.7	6.4/9.1	6.6/8.7	5.5/7.6	3.8/6.4	2.1/4.0	2.1/4.0	5.5/6.4
Latitude	Average	4.2	5.4	6.3	6.6	7.1	7.5	7.6	7.4	6.6	5.2	3.6	3.4	5.9
	Min/Max	3.4/5.2	3.8/6.9	4.6/7.6	5.3/8.0	5.5/9.0	5.8/9.4	6.2/8.8	6.4/8.6	5.5/7.7	4.0/6.7	2.2/4.4	2.3/4.4	5.5/6.5
Latitude +15	Average	4.4	5.6	6.2	6.3	6.7	7.0	7.1	7.0	6.4	5.2	3.7	3.6	5.8
	Min/Max	3.5/5.5	3.9/7.2	4.5/7.6	5.0/7.7	5.2/8.5	5.4/8.8	5.8/8.3	6.1/8.1	5.3/7.5	4.0/6.8	2.3/4.6	2.4/4.7	5.4/6.4

Solar Radiation for 2-Axis Tracking Flat-Plate Collectors (kWh/m²/day), Uncertainty ±11%

Tracker		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
2-Axis	Average	4.5	5.6	6.3	6.7	7.5	8.1	8.1	7.6	6.6	5.3	3.7	3.6	6.1
	Min/Max	3.6/5.5	3.9/7.2	4.6/7.6	5.4/8.1	5.8/9.4	6.3/10.0	6.6/9.3	6.6/8.8	5.6/7.7	4.0/6.8	2.3/4.6	2.5/4.8	5.7/6.7

Direct Beam Solar Radiation for Concentrating Collectors (kWh/m²/day), Uncertainty ±11%

Tracker		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
1-Axis, E-W Horiz Axis	Average	2.5	2.9	2.9	3.0	3.3	3.7	3.8	3.6	3.2	2.9	2.1	2.1	3.0
	Min/Max	1.8/3.2	2.0/4.1	1.8/3.8	2.1/4.0	2.2/4.9	2.3/5.2	2.6/4.6	2.9/4.4	2.4/4.1	1.9/4.1	1.1/2.8	1.2/2.9	2.8/3.4
1-Axis, N-S Horiz Axis	Average	1.7	2.5	3.2	3.8	4.4	4.9	4.9	4.6	3.8	2.7	1.5	1.3	3.3
	Min/Max	1.2/2.2	1.6/3.4	2.0/4.1	2.6/5.1	2.9/6.4	2.9/6.8	3.3/6.1	3.8/5.8	2.8/4.9	1.7/4.0	0.8/2.1	0.7/1.8	3.0/3.7
1-Axis, N-S Tilt=Latitude	Average	2.8	3.5	3.9	4.1	4.3	4.6	4.7	4.8	4.4	3.6	2.4	2.2	3.8
	Min/Max	1.9/3.5	2.3/4.8	2.4/5.0	2.8/5.5	2.9/6.4	2.8/6.5	3.2/5.9	3.9/6.0	3.2/5.7	2.3/5.2	1.2/3.2	1.3/3.1	3.4/4.3
2-Axis	Average	2.9	3.6	3.9	4.2	4.6	5.0	5.1	4.9	4.4	3.6	2.5	2.4	3.9
	Min/Max	2.1/3.8	2.4/5.0	2.4/5.0	2.9/5.6	3.1/6.7	3.0/7.0	3.4/6.3	4.0/6.2	3.3/5.7	2.4/5.3	1.3/3.3	1.4/3.3	3.6/4.5

Average Climatic Conditions

Element	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Temperature (°C)	-6.2	-4.8	0.6	6.3	11.8	16.9	20.3	19.6	15.1	9.2	3.7	-3.1	7.4
Daily Minimum Temp	-11.4	-10.3	-4.2	1.2	6.3	11.2	14.6	13.9	9.4	3.5	-0.9	-7.9	2.1
Daily Maximum Temp	-0.9	0.6	5.2	11.3	17.3	22.6	26.0	25.2	20.7	14.8	8.3	1.7	12.7
Record Minimum Temp	-32.2	-39.4	-29.4	-13.3	-5.0	0.6	4.4	0.6	-5.0	-9.4	-16.1	-29.4	-39.4
Record Maximum Temp	17.8	17.8	30.0	29.4	34.4	36.7	37.2	39.4	35.0	31.1	23.3	20.6	39.4
HDD, Base 18.3°C	761	649	551	362	202	56	6	22	105	284	438	663	4099
CDD, Base 18.3°C	0	0	0	0	0	12	68	62	7	0	0	0	149
Relative Humidity (%)	67	65	66	67	71	75	75	76	77	74	73	70	71
Wind Speed (m/s)	4.1	4.1	4.4	4.4	4.1	3.8	3.4	3.4	3.5	3.7	4.0	3.9	3.9