



8 August 2017

**CLIMATE STATISTICS FOR DUNEDIN
PROVIDED TO ASSIST THE HEARINGS PANEL IN THE CONSIDERATION OF LUC-2017-48**

1 GENERAL

The majority of the data described in the graphs below has been sourced from the 'World Weather & Climate Information' website, at: <https://weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine,Dunedin,New-Zealand>

The data used by the website is stated as being sourced from "... nearest weather station: Dunedin, New Zealand (0.0 KM)".

Selected data, specifically the monthly sunshine hours, has been verified against data from National Institute of Water & Atmospheric Research (NIWA), refer Appendix A. The two sets of data compared for verification purposes match reasonably closely.

The NIWA website states that the Dunedin Weather Station, located in Musselburgh, has been collecting climate data for 27 years.

The only exception to the above data source is the information which described in Section 3.2 relating to sunshine days. This data has been sourced from the 'Meteoblue' website, at: https://www.meteoblue.com/en/weather/forecast/modelclimate/dunedin_new-zealand_2191562

According to the Meteoblue website, the climate data is based on 30 years of hourly weather model simulations. These simulations use historical data from 1985 onwards.

The simulated weather data has a spatial resolution of approximately 30km and provides "a good indication of typical climate patterns and expected conditions (temperature, precipitation, sunshine and wind)". The website acknowledges that the simulations may not reproduce all local weather effects.

The potential limitations of the Meteoblue simulated weather data need to be kept in mind.

DUNEDIN:

P.O. Box 5933,
Dunedin 9058.

T 03 477 3245

CHRISTCHURCH:

P.O. Box 160094,
Christchurch 8441.

T 03 928 1533

ALEXANDRA:

P.O. Box 103,
Alexandra 9340.

T 03 448 8775

CROMWELL:

P.O. Box 84,
Cromwell 9342.

T 03 445 1826

QUEENSTOWN:

P.O. Box 2645,
Queenstown 9349.

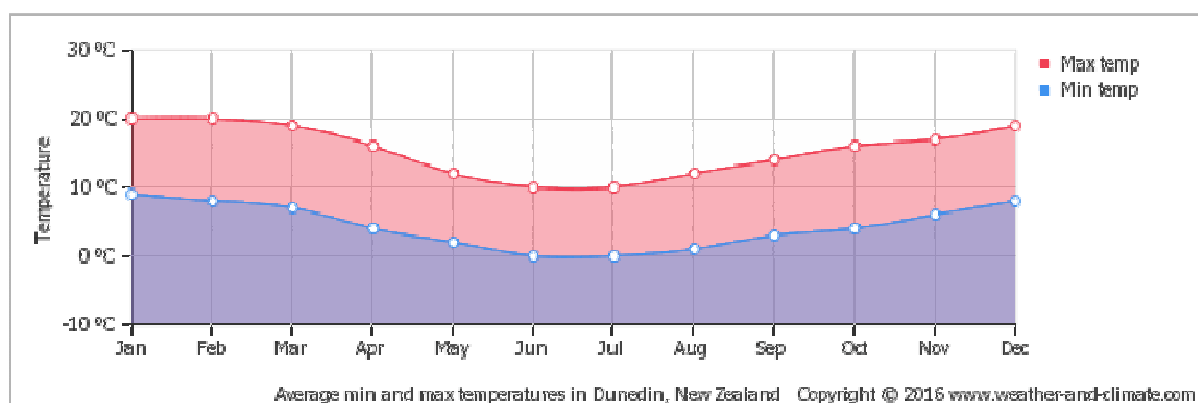
T 03 441 4715

WANAKA:

P.O. Box 283,
Wanaka 9305.

T 03 443 0110

2 Average Minimum and Maximum Temperature in Dunedin

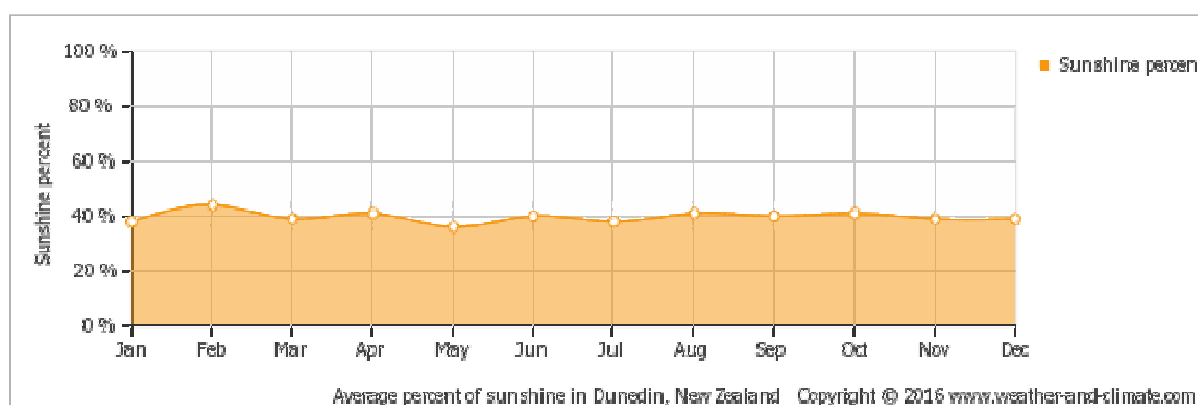


Shading in the Octagon from the proposed hotel will occur for a period of 11 weeks from mid-May to late-July. During this time the average maximum temperature is approximately 11°C and the average minimum temperature is approximately 1°C.

3 Sunshine in Dunedin

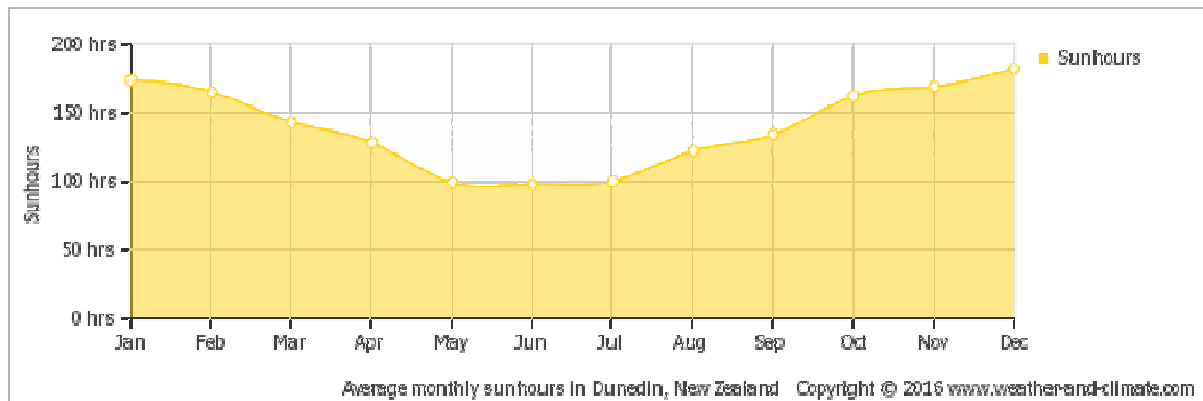
The information below describes the historical nature of sunshine within Dunedin.

3.1 Sunshine Data from *World Weather & Climate Information*.



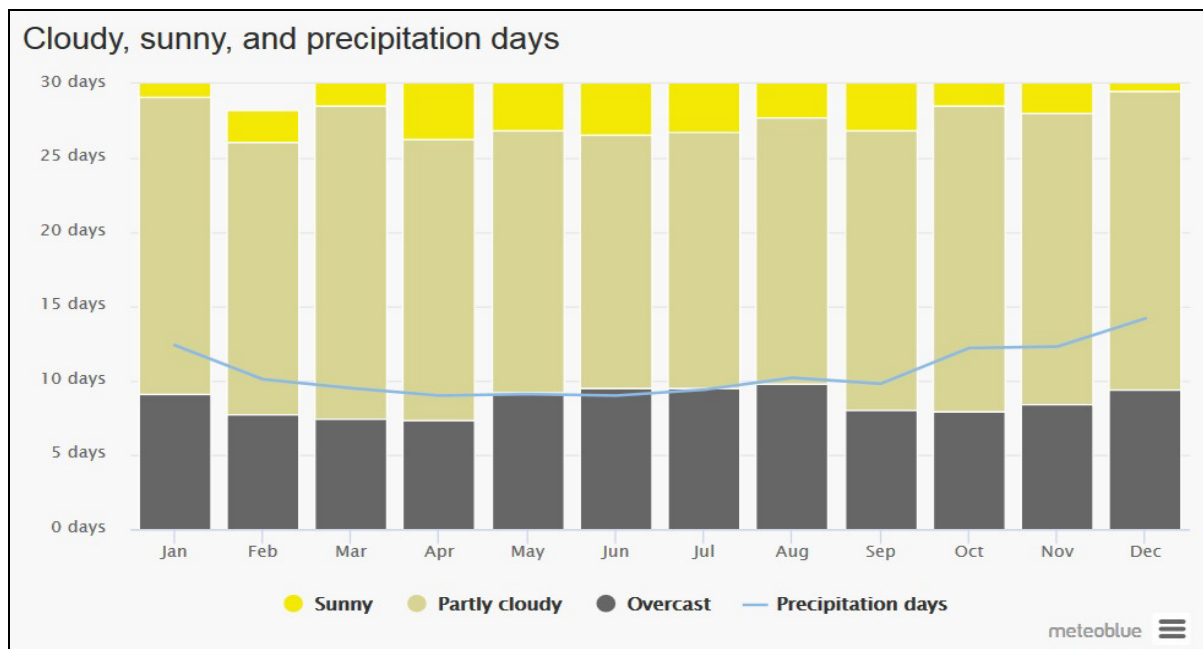
The above graph shows the average percent of sunshine in Dunedin. This is the proportion of sunshine that occurs from the total available hours of possible sunshine.

This is generally fairly static throughout the year, including the 11 week period during which time the proposed Hotel will introduce potential shading effects into the Octagon, at around 40%.



The above graph shows the average actual sunshine hours in Dunedin. Over the 11 weeks from mid-May to late-July, in which the proposed Hotel will shade the Octagon, there is an average of just over 100 hours per month of actual sunshine. Taking June as an example (30 days), this would equate to around 3.5 hours of sunshine per day on average. The data does not indicate if there is a period of the day at which sunshine is more likely to occur.

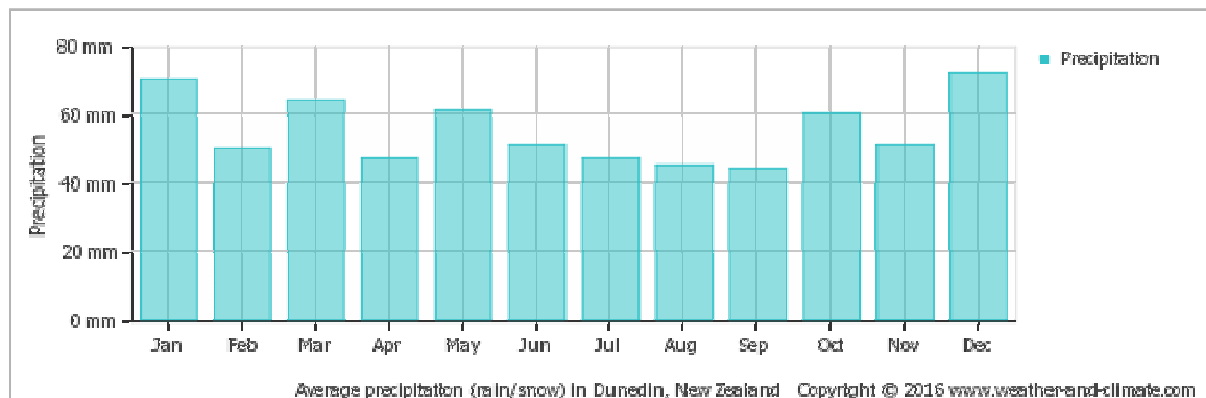
3.2 Sunshine Data from *Meteoblu*.



The above graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. The Meteoblu website defines the graphed categories as follows: “Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast”.

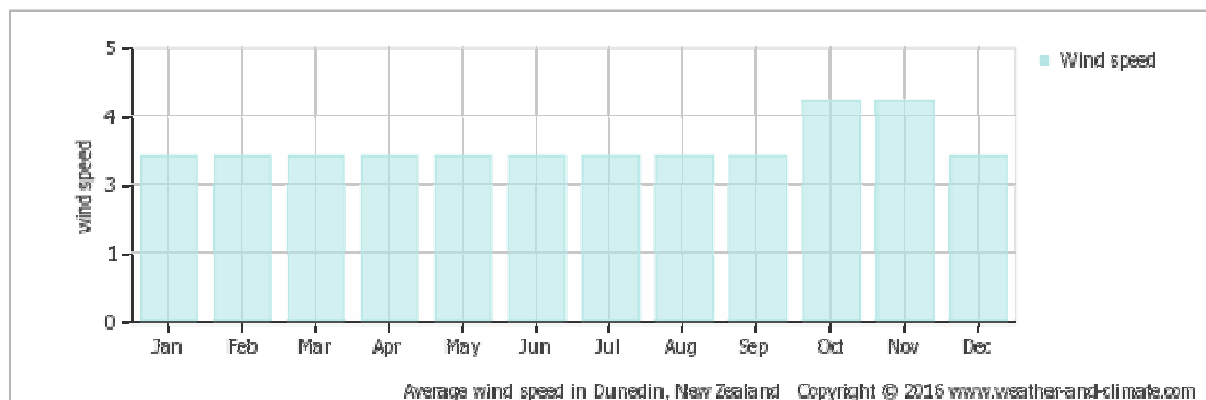
Shading in the Octagon from the proposed hotel will occur for a period of 11 weeks from mid-May to late-July. Over this period, the average number of days per month in which days are considered to be sunny is 3.9. The average number of cloudy days per month is 17.4, and the average number of overcast days per month is 9.2.

4 Precipitation in Dunedin



This graph shows the average monthly precipitation in Dunedin.

5 Wind in Dunedin



This graph shows the average monthly wind speed in Dunedin.

Yours faithfully

PATERSON PITTS GROUP

Kurt Bowen

Registered Professional Surveyor

Appendix A: NIWA Statistics

Mean monthly total sunshine (hours)													
Data are mean monthly values for the 1981-2010 period for locations having at least 5 complete years of data													
Station details are available in separate table													
LOCATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Kaitiaki	223.5	201.7	201.1	160.6	143.0	126.8	138.6	161.8	165.3	190.7	192.7	209.9	2115.7
Auckland	228.8	194.9	189.2	157.3	139.8	110.3	128.1	142.9	148.6	178.1	188.1	197.2	2003.1
Tauranga	261.5	217.3	214.0	183.9	165.3	135.4	151.0	173.4	174.1	212.7	224.2	232.7	2345.6
Hamilton	229.8	192.9	193.3	165.1	138.3	112.8	126.4	144.1	147.5	174.8	187.1	207.6	2019.6
Rotorua	242.9	205.9	199.7	170.5	145.1	119.1	130.7	152.1	155.1	190.8	200.1	215.8	2127.8
Gisborne	249.9	200.7	190.7	164.9	145.6	128.6	124.1	163.3	180.7	219.4	217.5	232.4	2217.7
Taupo	224.3	202.6	179.7	156.3	126.3	96.1	116.5	134.6	140.0	179.6	190.4	204.6	1950.9
New Plymouth	248.4	225.0	212.8	177.8	143.9	118.1	138.0	162.7	162.6	189.6	206.9	211.6	2197.2
Napier	249.3	202.6	201.7	172.4	155.6	130.7	134.7	166.8	181.2	213.9	216.2	233.7	2258.7
Wanganui	250.2	213.5	192.1	159.4	129.0	99.2	120.7	137.8	147.5	180.1	203.6	221.9	2055.0
Palmerston North	212.4	191.0	173.5	145.6	109.3	79.1	103.8	119.9	124.2	142.6	165.3	176.7	1743.5
Masterton	238.6	204.4	169.2	155.6	132.0	99.9	114.9	128.6	148.0	184.0	185.6	221.3	1982.2
Wellington	246.9	210.9	205.2	161.3	132.7	99.1	118.9	147.3	163.2	192.8	209.3	222.8	2110.3
Nelson	267.5	231.4	230.4	196.2	175.7	143.3	159.0	182.2	189.3	221.4	234.9	241.1	2472.4
Blenheim	262.2	223.7	230.8	193.7	172.7	151.6	157.1	183.9	189.5	226.7	234.7	248.8	2475.3
Westport	213.0	174.9	164.2	151.5	114.7	93.4	120.7	118.6	138.9	158.4	171.7	179.4	1799.3
Kaikoura	247.8	193.8	183.8	173.3	145.8	118.8	136.9	155.7	175.9	194.2	198.7	212.4	2137.1
Hokitika	219.5	187.4	177.3	146.7	119.1	98.7	126.1	136.7	141.0	167.8	184.0	189.4	1893.8
Christchurch	237.9	195.0	191.2	162.6	140.8	117.1	127.1	153.9	169.5	203.8	223.7	219.9	2142.5
Mt Cook	184.8	167.2	151.1	125.3	92.1	66.1	74.5	113.0	130.3	149.4	158.5	168.7	1580.9
Lake Tekapo	253.8	220.9	230.9	199.4	145.4	139.9	149.7	170.1	200.0	231.7	241.5	234.0	2417.4
Timaru	192.7	170.2	168.6	158.0	130.1	121.0	131.0	151.5	156.5	183.4	189.0	179.7	1931.9
Queenstown	230.3	207.3	187.0	145.4	87.8	71.8	88.3	120.0	153.6	197.7	216.6	223.5	1929.2
Alexandra	231.4	199.8	193.7	158.2	121.2	87.1	90.7	135.9	164.7	193.9	214.1	215.0	2005.8
Te Anau	184.2	178.5	152.9	125.3	84.8	64.9	66.0	115.6	138.4	178.6	192.3	180.1	1661.4
Dunedin	179.6	158.0	146.1	125.9	108.4	95.3	110.6	122.2	136.8	165.5	166.9	168.3	1683.7
Invercargill	185.9	167.2	142.6	117.2	87.5	78.7	97.9	123.0	139.8	173.0	181.3	188.2	1682.2
Chatham Islands	191.3	145.5	124.2	106.3	81.2	61.8	74.4	101.0	109.1	129.7	148.9	164.0	1437.3