

Public Concern/Statement - Operational Wind Conditions at Frogs Hollow Airfield

The statement was made that weather conditions (in particular wind conditions) at Frogs Hollow made the air field unsuitable. The statement was made that of 441 days, the wind conditions exceeded 20Km/hr and therefore the flights could not operate safely 336 days of the year which was said to equate to 76% of the year.

The following document has been put together to address this statement directly. A basic level of aviation and the impact of winds has been explained to help the reader better understand the data.

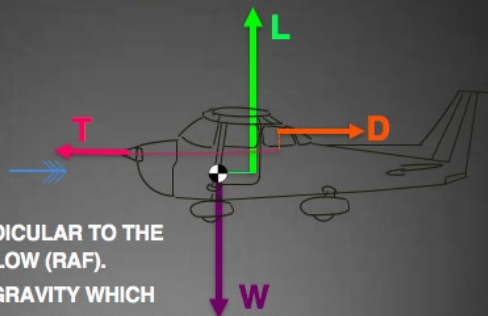
Response

Mitch Boyle, senior flight instructor and commercial pilot on behalf of Sports Aviation Flight College Australia Ltd (SAA) provides the following information to explain why the statements made are incorrect.

Firstly, it is important to understand some fundamentals of aviation.

DEFINITIONS

THE FOUR FORCES:



LIFT - ACTS PERPENDICULAR TO THE RELATIVE AIRFLOW (RAF).

WEIGHT - FORCE OF GRAVITY WHICH ACTS STRAIGHT DOWN TOWARDS EARTH.

THRUST - PROVIDED BY THE ENGINE THROUGH THE PROPELLER SHAFT.

DRAW - RESISTANCE OF MOTION WHICH ACTS PARALLEL TO RAF.

Image 1.1 The Basics of Flight

The image to the left shows the forces at play during flight.

- Thrust is referred to as the forward force (please not this is measured relative to the flying body, NOT the ground speed)
- The weight of the body is constantly pulling the body downwards.
- The lift is created by air traveling over the wings at particular angles
- Drag is the force pulling the body in a backwards motion
- The resulting force is the accumulative effect of these forces and is the result. This is particularly relevant in the take off and landing of aircraft as this "resulting force" is the trajectory of flight.

The image on the following page explains the effects that no wind, headwinds and tailwinds have on the resulting ground speed. It should be noted that the ground speed of the aircraft is a result of it's travel speed combined with the forces of the wind effecting the aircraft.

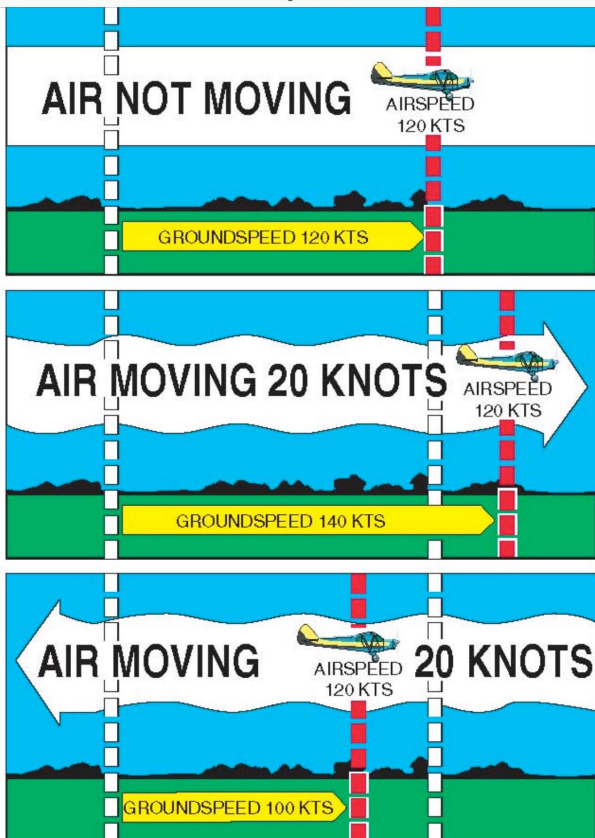


Image 1.2 The Effects of Wind on Aircraft Speed

The image to the left shows the effects of wind (nil, headwind and tailwind shown in the diagram) on the aircraft's ground speed.

- The top image shows the aircraft flying with no wind affecting the aircraft. In this instance the aircraft's airspeed is identical to the aircraft's ground speed.
- The centre image shows the aircraft flying with a tailwind in play. In this scenario, the ground speed is the combination of the tailwind speed AND the aircraft's flight speed.
- The bottom image shows the aircraft flying with a headwind in play. In this scenario, the ground speed is the result of the aircraft's airspeed MINUS the headwind speed.

These effects of wind on the aircraft are particularly relevant for take-off and landing as they directly affect the distance and speed required to take off and land an aircraft. The following image demonstrates the effect of a headwind on an aircraft during takeoff.

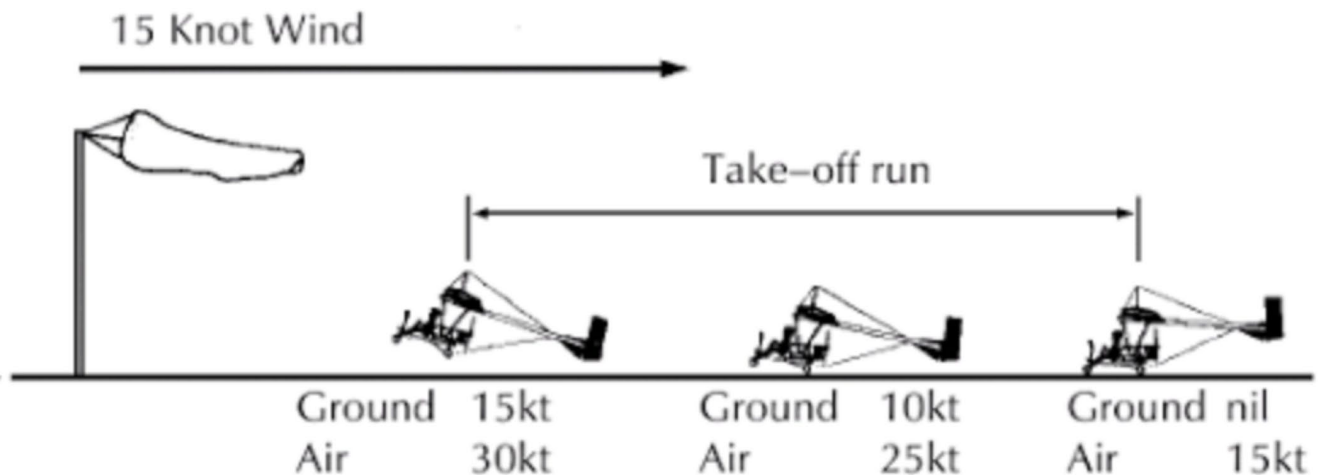


Image 1.3 Ground Speed VS Air Speed during Take-off

The image above demonstrates the effect that a 15 knot headwind has on the take-off of an aircraft.

- At each of the positions, the relative air speeds of the aircraft and the ground speed are shown. A 15 knot ground speed is required to achieve a 30 knot air speed.
- In the above scenario, due to the headwind the take-off run is a shorter distance and a slower ground speed is required than it would be if there was no wind. This is advantageous for flight as less of the runway is required for takeoff.
- If there was a direct tailwind of the same magnitude, the results would be the opposite - The aircraft would need MORE of the runway to takeoff and a much faster ground speed would be required.
- It should also be noted that crosswinds (winds perpendicular to the side of the aircraft) have zero effect on the take-off run distance or speed required for take-off.

A similar effect is applied when landing an aircraft. The image below shows the different effects that headwinds, nil winds and tail winds have on the distance required to land an aircraft.

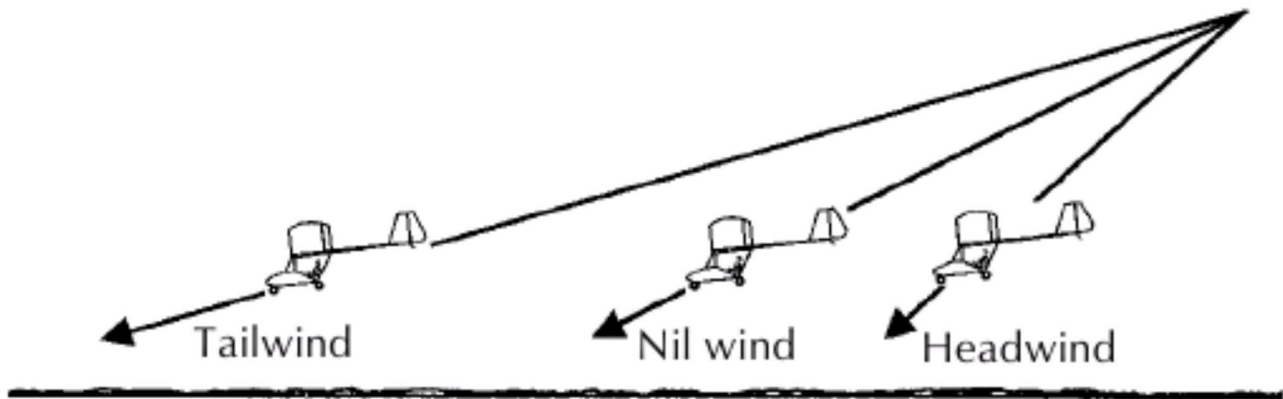


Image 1.4 Effect of Wind Direction

The image above demonstrates the effect that the direction of wind (or no wind) has on an aircraft when landing

- Tailwind increases the distance traveled to complete the landing
- Nil wind has no effect on the distance traveled to complete the landing
- Headwind decreases the distance traveled to complete the landing
- While tailwinds are advantageous for shorter flight times once airborne, headwinds are advantageous for take off and landing as they require less of the runway and reduced take-off and landing speeds.
- Once again, cross winds (winds perpendicular to the side of the aircraft) have no effect on the distance required or speed of the aircraft when landing.

It should be noted however, that not all wind acting on an aircraft is a direct headwind, tailwind or crosswind. An example is shown in the image below, where the wind is acting on the aircraft at approximately 45 degrees.

This provides for a combination of headwind and crosswind acting on the aircraft and the amount of each can be calculated.

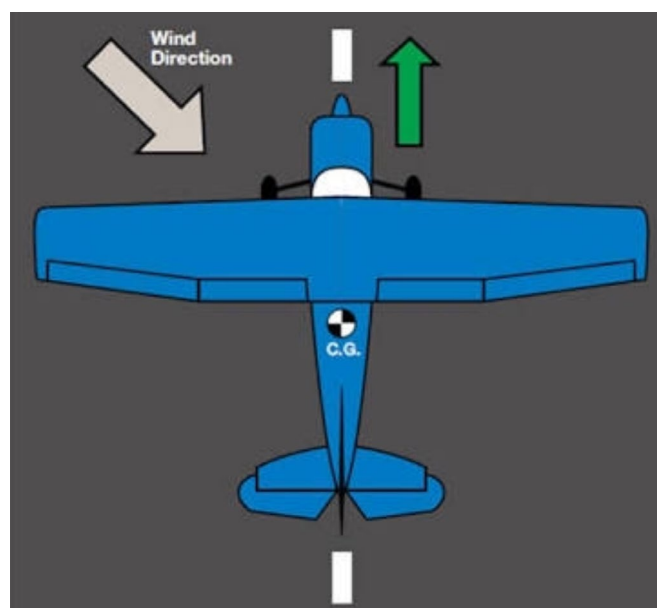


Image 1.5 Aircraft with a Partial Headwind and a Partial Crosswind

The image above shows a partial headwind and a partial crosswind applied to the aircraft

- This wind direction is a combination of headwind AND crosswind.
- This angled wind can be broken down into its effective headwind and crosswind components

The image below shows the procedures a pilot takes when there is a direct crosswind effect on the aircraft.

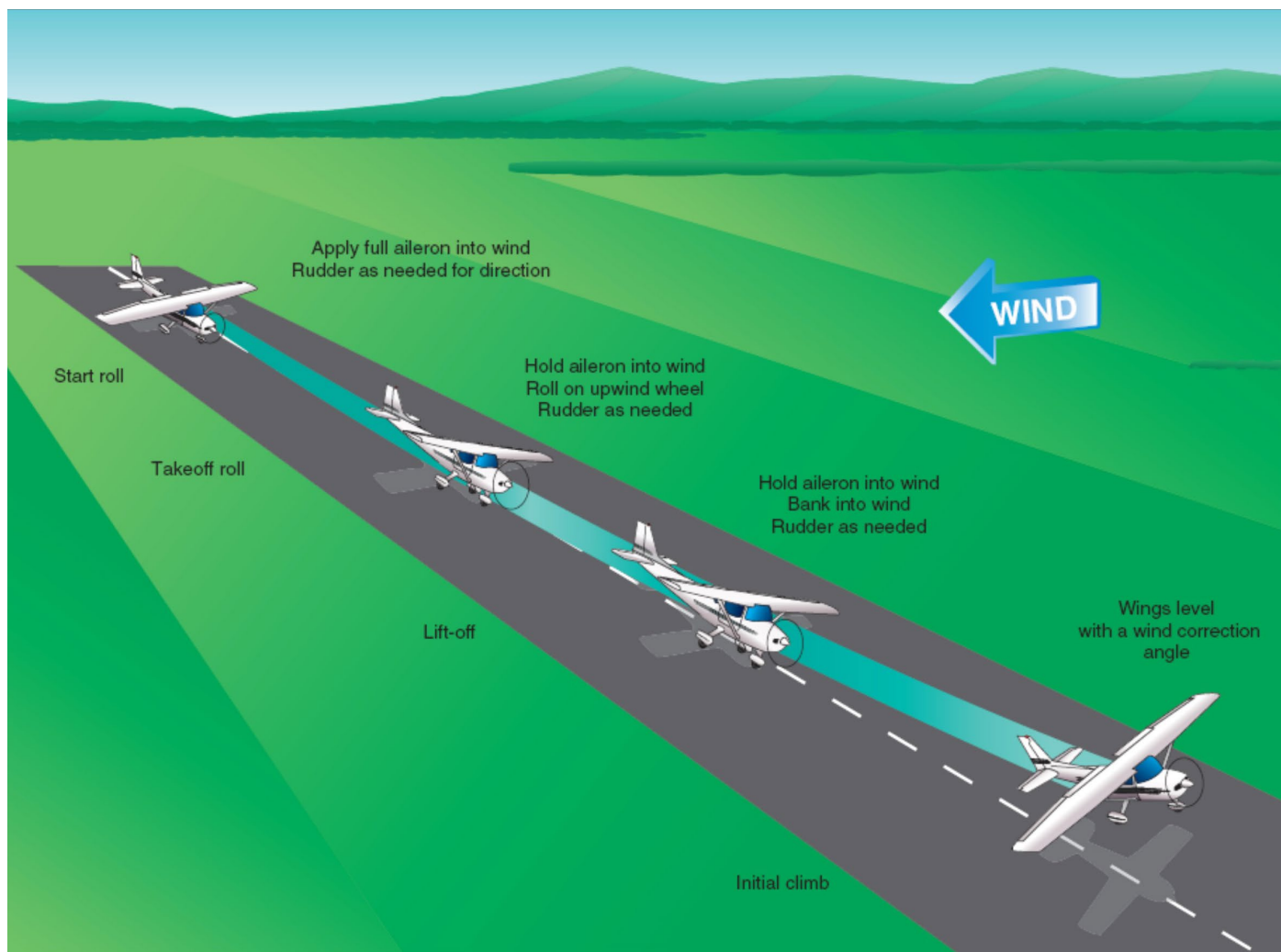


Image 1.6 **Aircraft Operation with a Crosswind**

The image above demonstrates how an aircraft takes off with a cross wind.



All aircraft have a direct crosswind component stipulated by the aircraft manufacturer (which is different for each type of aircraft). This is the maximum '**direct**' crosswind specified by the manufacturer for the aircraft to operate safely during take-off and landing. **The Bantam aircraft (shown above) that will be used by SAA has a 15 knot (25.93 Km/hr) crosswind component.**

Calculating Safe Wind Speeds for Operations

To calculate the safe maximum wind speed for operating the Bantam at Flight College, we can use the Bantam's direct crosswind component of 15 knots (25.93Km/hr) and work backwards.

To do this, we firstly need to understand the advantages of having a cross-directional runway.

Cross Directional Runway

With two runways perpendicular to each other, as is the case at Frog's Hollow, take-off and landing directions can be chosen to take advantage of the relative wind direction.

Image 1.8a - Runway A operating

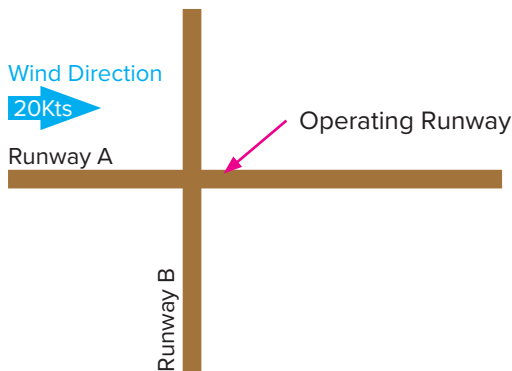
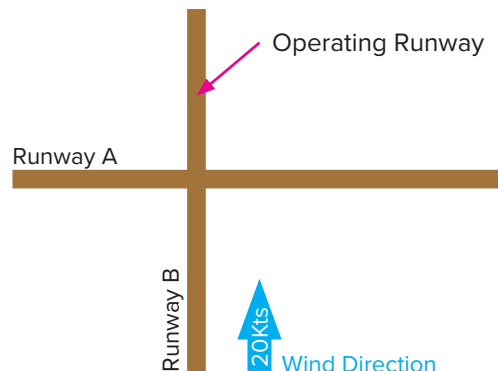


Image 1.8b - Runway B operating



Images 1.8a and 1.8b Wind Direction vs Operating Runway

The image above demonstrates which runway is used depending on the direction of the wind.

- In image 1.8a, the wind is running parallel to Runway A which is therefore the runway which would be used in this example. Runway B would have direct crosswinds (shown above as 20Kts) and would not be used.
- Similarly in image 1.8b, the wind is running parallel to Runway B which is therefore the runway which would be used in this example. This time runway A would have direct crosswinds (20Kts) and would therefore not be used.

To calculate the maximum wind strength for operation of the Bantam at Frogs Hollow we use a combination of the aircraft's crosswind component (15 Knots) and the wind acting at 45 degrees to the aircraft. We apply this to the standard graph shown on the following page

The 'worst case wind direction' for either runway is shown in the diagram below (at 45 degrees to runway)

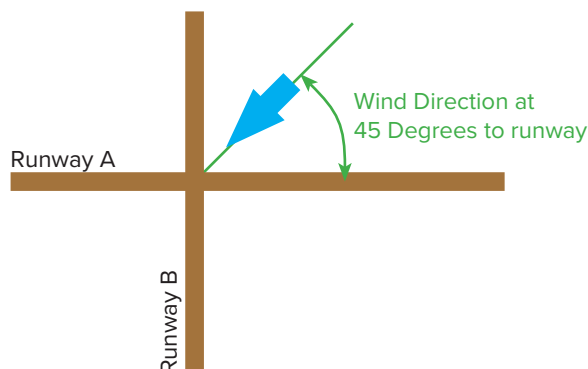
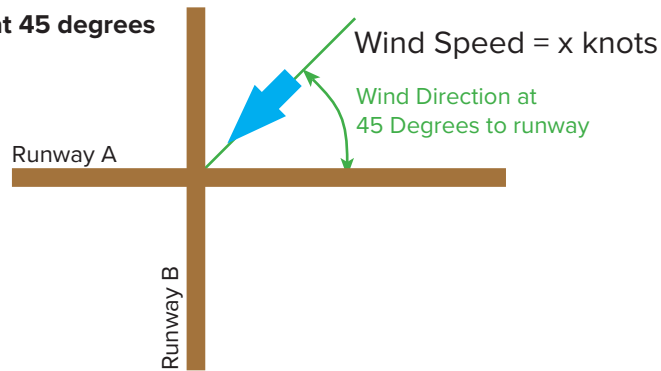


Image 1.9 'Worst case wind direction'

The image above shows the wind direction that will produce the highest level of crosswinds on either runway at any time.

- As this angle is split in between the two runways, changing runways does not make a difference to the crosswind component
- As this is not a direct crosswind (perpendicular to the operating runway), the effective crosswind speed is one component of the wind and can be calculated using the table on the following page.

Image 2.0 'Worst case wind speed' at 45 degrees



We therefore need to calculate what Wind Speed (shown as “x” above) traveling at 45 degrees to the runway that will produce a crosswind component of 15 knots (25.93Km/hr).

The relationship between direction of wind and the resulting headwind components and crosswind components can be seen in the table below.

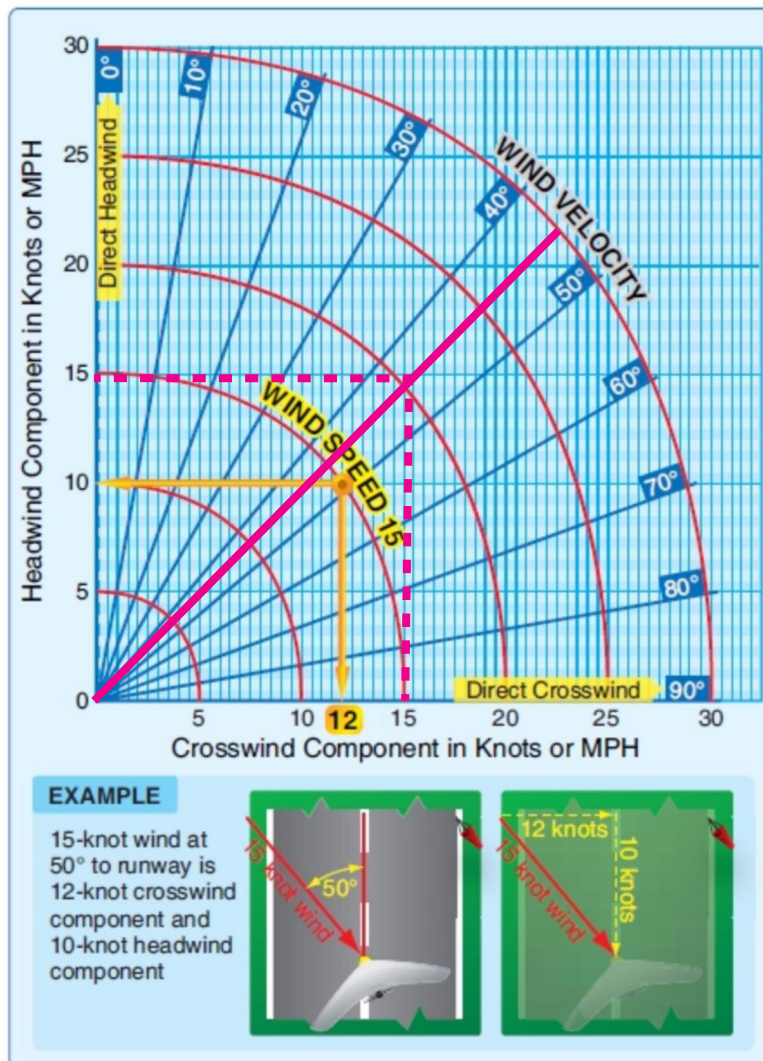


Image 2.1 Direct Crosswind Component Graph

The pink line that has been overlayed shows that a **wind velocity of around 20 knots (37.04Km/hr) at 45 degrees produces a crosswind component of 15 knots (25.93Km/hr)**. This is of course the worst case scenario.

On the following pages we have displayed screenshots taken from the Bureau of Meteorology's website that shows the Daily Weather Conditions for each month of the year that the College is flying (2 months of the year there is no flight training).

Image 2.2 Bega AWS Monthly Weather Conditions

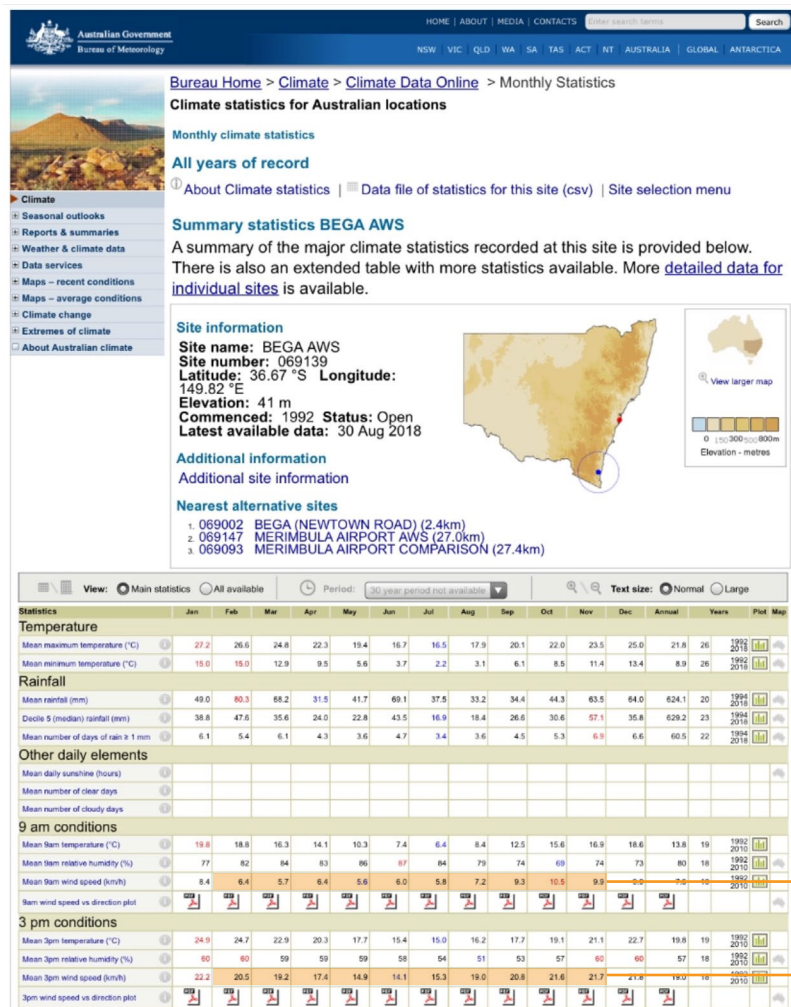


Image 2.2 to the left shows the monthly averages of weather conditions at the “Bega AWS location”. The highest monthly average wind speed for the year recorded at 9am was 10.5km/hr and 22.2km/hr recorded at 3pm. These averages are nowhere near the threshold of 37km/hr derived from the previous calculations.

Images 2.3 - 3.2 are screenshots of the weather conditions broken down into each day’s records. As the College is to only perform flight training between February and November, only these months have been shown.

The two columns showing the daily recordings of wind speed at 9am and 3pm have been outlined in orange. The highest speed of each month for each time slot is shown in red text and any day where the recorded wind speed is 37km/hr or above has been highlighted in orange.

The past year’s average wind speeds for each month that the College will be flying. Measurements taken at 9am and 3pm each day.

Image 2.3 Bega AWS Feb 2018 Weather Conditions

Bega, New South Wales February 2018 Daily Weather Observations

Date	Day	Temps		Rain	Evap	Sun	Max wind gust					9 am					3 pm					
		Min °C	Max °C				Dir	Spd km/h	Time	Temp °C	RH %	Dir	Spd km/h	Time	Temp °C	RH %	Dir	Spd km/h	Time	Temp °C	RH %	
1	Th	8.4	21.9	0.2			SSW	46	06:52	16.2	59		SW	9	10:16.8	20.5	49		SE	17	10:16.0	
2	Fr	8.8	25.2	0			ESE	33	14:48	15.3	76		Calm	10	19:3	23.7	44		ESE	19	10:17.5	
3	Sa	12.0	25.4	0			SW	31	11:59	16.9	89		WSW	2	10:22.5	22.0	60		SE	20	10:22.0	
4	Su	11.6	25.7	1.0			E	30	13:31	16.5	93		Calm	10	10:25.0	24.1	57		ESE	15	10:22.0	
5	Mo	11.7	28.9	0			ESE	31	14:05	17.0	89		SSE	4	10:20.7	27.2	43		SE	20	10:17.5	
6	Tu	13.8	26.7	0			ENE	39	13:17	19.8	79		Calm	10	10:20.9	24.9	60		ENE	24	10:19.4	
7	We	17.1	28.8	0			NE	50	15:20	23.3	68		NE	9	10:20.0	26.6	59		NE	35	10:16.7	
8	Th	15.2	36.4	0			SSE	30	15:22	21.9	79		SE	6	10:15.8	35.8	39		ENE	13	10:09.7	
9	Fr	18.8	27.2	0			SE	35	15:15	23.0	80		NNE	4	10:14.9	25.4	67		ENE	9	10:13.6	
10	Sa	18.4	31.5	0			S	35	15:27	22.0	86		E	6	10:11.0	29.4	57		E	26	10:05.0	
11	Su	17.2	28.0	1.0			SSW	41	08:02	20.4	77		SW	28	10:04.9	26.4	46		E	17	10:03.6	
12	Mo	16.3	22.4	0			ENE	24	15:23	17.8	75		Calm	10	10:09.3	21.8	58		SE	11	10:09.5	
13	Tu	14.7	25.4	0			ENE	33	14:40	18.2	82		ESE	2	10:14.1	24.2	60		NE	19	10:11.1	
14	We	14.6	36.4	0			W	67	12:17	17.8	97		Calm	10	10:05.8	35.1	14		WNW	35	10:01.5	
15	Th	14.1	28.8	0			SE	33	17:52	19.2	66		S	11	10:14.0	27.6	49		ENE	22	10:07.6	
16	Fr	15.2	26.5	0			ESE	37	12:04	20.1	74		E	6	10:11.3	23.5	57		ESE	20	10:11.0	
17	Sa	15.3	30.4	0			ENE	37	13:50	21.7	68		N	19	10:13.9	29.1	51		ENE	20	10:09.0	
18	Su	16.0	30.8	0			SE	33	13:26	20.9	80		E	7	10:12.3	27.7	53		ESE	20	10:10.4	
19	Mo	18.4	22.4	2.2			SE	44	17:54	18.7	95		WSW	7	10:15.4	21.6	75		SSW	9	10:15.9	
20	Tu	15.4	21.9	13.2			E	31	13:56	16.7	72		SW	13	10:22.6	19.7	55		ESE	22	10:20.9	
21	We	11.6	24.9	0.2			NE	33	15:20	16.9	84		E	2	10:19.7	23.9	47		NE	22	10:16.2	
22	Th	12.8	28.3	0			ENE	43	15:07	15.7	93		SSW	2	10:17.2	26.2	50		ENE	24	10:13.9	
23	Fr	14.7	29.4	0			NNE	41	09:22	18.1	99		S	6	10:15.2	28.4	52		NE	24	10:10.9	
24	Sa	16.4	39.2	0			NW	50	11:17	21.3	87		S	7	10:05.9	37.6	27		WNW	19	999.8	
25	Su	16.6	21.0	12.0			SE	44	16:03	17.3	84		SSE	11	10:09.4	20.0	69		NE	9	10:10.3	
26	Mo	14.2	22.7	20.8			SE	33	16:24	15.6	95		Calm	10	10:17.5	22.1	65		E	17	10:17.1	
27	Tu	11.3	25.3	1.8			NNE	31	11:28	12.8	99		SE	2	10:19.5	24.3	56		ENE	20	10:15.8	
28	We	10.3	30.7	0			SSW	33	19:48	13.1	99		SSW	2	10:10.0	27.5	54		ESE	13	10:04.9	
Statistics for February 2018																						
Mean	14.3	27.6									18.4	83			5	10:15.2	25.9	52		19	10:12.5	
Lowest	8.4	21.0	0								12.8	59		Calm	10:04.9	19.7	14		9	999.8		
Highest	18.8	39.2	20.8				W	67		23.3	99		SW	28	10:25.0	37.6	75		35	10:22.0		
Total			52.4																			

0 measurements over 37Km/hr in either time slot in February

Image 2.4 Bega AWS Mar 2018 Weather Conditions

Bega, New South Wales March 2018 Daily Weather Observations

Date	Day	Temps		Rain	Evap	Sun	Max wind gust					9 am					3 pm				
		Min	Max				Dir	Spd	Time	Temp	RH	Dir	Spd	MSLP	Temp	RH	Dir	Spd	MSLP		
		°C	°C	mm	mm	hours	km/h	local	°C	%	g/h	km/h	hPa	°C	%	g/h	km/h	hPa			
1	Th	13.0	25.9	0			SSW	50	06:32	19.8	54	WSW	19	10:11.9	23.6	50	S	22	10:12.0		
2	Fr	12.1	24.9	0			SSE	28	11:06	17.4	81	E	4	10:15.6	23.3	54	ENE	11	10:12.9		
3	Sa	17.1	28.7	0			E	30	13:32	19.8	80	SE	2	10:10.7	26.8	60	E	20	10:07.1		
4	Su	16.6	24.7	0			ESE	30	18:02	20.4	72	ESE	7	10:13.7	22.0	59	E	17	10:13.2		
5	Mo	16.0	21.2	0			SW	28	18:02	17.0	86	W	7	10:17.1	19.9	61	S	11	10:17.3		
6	Tu	13.8	23.6	0			ESE	39	11:54	17.7	70	SSW	7	10:25.8	22.8	52	ESE	19	10:26.1		
7	We	12.7	24.6	0.2			ESE	31	13:36	16.3	93	NE	6	10:28.7	22.2	52	ENE	17	10:26.9		
8	Th	8.4	25.5	0			E	35	13:47	12.6	97	Calm	10	10:27.6	24.1	52	ENE	22	10:24.9		
9	Fr	12.6	26.1	0.2			ENE	31	14:55	16.1	82	Calm	10	10:28.6	25.3	49	NE	22	10:24.9		
10	Sa	9.7	27.7	0			NE	39	15:20	13.6	98	Calm	10	10:27.7	25.8	51	NE	24	10:24.0		
11	Su	11.0	24.9	0			SSE	35	16:53	13.8	99	Calm	10	10:27.8	34.0	21	ENE	11	10:16.6		
12	Mo	13.4	24.9	0			E	30	14:12	16.7	89	Calm	10	10:19.5	23.5	53	E	20	10:17.0		
13	Tu	7.8	24.7	0			W	28	09:37	14.0	83	Calm	10	10:21.5	23.5	47	ESE	19	10:19.6		
14	We	13.3	28.4	0			ENE	39	14:04	17.3	81	SE	2	10:20.0	25.8	56	ENE	26	10:13.6		
15	Th	15.4	25.1	2.6			SE	35	13:05	17.0	99	S	4	10:12.7	21.2	69	ESE	22	10:11.6		
16	Fr	16.0	24.6	0			NE	39	14:00	18.6	77	Calm	10	10:18.6	22.5	62	NNE	26	10:15.4		
17	Sa	16.4	31.7	1.0			E	30	13:21	19.5	86	NE	6	10:14.3	29.5	34	ESE	20	10:11.3		
18	Su	15.1	38.6	0.2			NW	76	13:37	18.2	79	SSW	4	10:06.0	38.4	15	WNW	30	10:02.1		
19	Mo	9.8	28.7	0			SSE	28	16:16	14.4	82	SSW	7	10:14.5	28.1	37	ESE	17	10:11.1		
20	Tu	11.2	24.8	0			E	41	12:29	14.8	79	ENE	6	10:23.5	19.5	64	SE	17	10:25.2		
21	We	12.8	19.0	2.0			ESE	30	14:09	14.3	88	SW	9	10:33.5	18.6	51	SE	19	10:32.3		
22	Th	12.7	20.0	5.6			NE	39	14:37	14.1	99	SW	11	10:31.5	18.7	74	ENE	20	10:29.0		
23	Fr	14.1	22.5	5.8			NE	35	12:12	15.5	98	SSW	4	10:26.8	22.3	64	NE	22	10:21.7		
24	Sa	13.4	26.3	0			SW	35	13:34	15.7	94	SE	4	10:17.2	22.7	79	Calm	10	10:12.2		
25	Su	15.7	27.1	5.0			SW	41	12:30	17.8	98	SSW	9	10:03.6	24.7	43	WSW	26	10:05.7		
26	Mo	10.2	22.8	1.4			W	48	13:58	14.6	53	W	20	10:04.8	22.4	30	W	26	10:05.2		
27	Tu	5.2	22.4	0			NE	43	14:44	11.2	78	Calm	10	10:18.3	21.0	45	ENE	30	10:16.2		
28	We	11.2	29.1	0			NE	22	15:19	14.7	88	Calm	10	10:16.1	27.5	31	NE	13	10:13.2		
29	Th	8.6	28.4	0			ENE	26	16:13	13.8	90	ENE	2	10:17.4	27.8	59	ENE	11	10:12.5		
30	Fr	13.5	25.1	0			SE	31	14:26	17.1	95	S	2	10:13.9	23.5	61	E	13	10:13.0		
31	Sa	16.9	23.7	0			ENE	31	15:09	18.4	70	NE	7	10:20.7	23.4	63	NE	20	10:16.8		

Statistics for March 2018

Mean	12.8	26.0				16.2	84				4	1018.8	24.3	51			19	1016.4	
Lowest	5.2	19.0	0			11.2	53				Calm	1003.6	18.6	15			Calm	1002.1	
Highest	17.1	38.6	5.8			NW	76			20.4	99	W	20	1033.5	38.4	79		# 30	1032.3
Total																			24.0

ICD:IDW2013.201803

Prepared at 13:00 UTC on Sunday 19 August 2018

Image 2.5 Bega AWS Apr 2018 Weather Conditions

Bega, New South Wales
April 2018 Daily Weather Observations

		Temps		Rain		Evap		Sun		Max wind gust				9 am				3 pm			
Date	Day	Min	Max	mm	mm	hours	Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C					km/h	local	°C	%	g th		km/h	hPa	°C	%	g th		km/h	hPa
1	Su	12.4	23.7	0			SE	19	12:47	13.8	99		S	4	1015.2	23.0	63		E	11	1013.3
2	Mo	13.8	26.4	0			SE	35	13:45	18.4	78		Calm	1014.3	23.6	60		ESE	20	1014.5	
3	Tu	14.8	22.3	0			E	26	13:05	17.9	77		S	7	1020.3	20.2	62		ESE	11	1020.5
4	We	15.2	24.6	0			ESE	26	12:44	18.5	78		S	2	1022.4	23.2	66		E	15	1018.4
5	Th	11.8	30.0	0			SSE	28	13:28	15.5	99		Calm	1015.8	28.9	42		ENE	17	1011.1	
6	Fr	15.4	20.7	0			ESE	20	18:11	17.3	88		S	6	1019.7	19.5	73		ENE	9	1017.8
7	Sa	15.7	25.6	0			ESE	24	15:02	18.1	80		ESE	4	1020.4	24.0	63		ESE	15	1016.8
8	Su	15.7	26.3	0			NE	26	15:05	19.4	79		NE	7	1020.1	25.3	58		ENE	17	1014.9
9	Mo	11.0	28.5	0.2			E	43	13:23	18.3	81		NNE	7	1016.8	23.9	58		ENE	22	1016.2
10	Tu	11.3	23.1	0.2			NE	37	14:38	15.5	94		SSE	6	1022.7	21.7	65		ENE	24	1018.7
11	We	12.3	31.6	0			WNW	20	00:24	19.1	77		E	2	1017.8	30.3	47		ESE	7	1013.9
12	Th	12.6	36.5	0			WNW	59	12:56	21.3	74		SE	4	1012.5	34.9	19		WNW	24	1007.1
13	Fr	12.7	24.4	0			NNW	24	23:59	19.7	72		SSE	7	1011.8	21.9	72		SSE	9	1006.6
14	Sa	15.1	27.8	0			WNW	93	15:38	23.0	29		WSW	17	1000.2	26.2	20		NW	35	994.3
15	Su	14.6	26.2	0			W	54	13:43	19.8	35		W	20	999.4	26.0	26		W	20	998.4
16	Mo	10.3	27.7	0			WSW	67	13:09	17.9	73		E	6	1007.7	25.9	33		W	26	1007.0
17	Tu	12.0	21.7	0			SW	35	00:43	16.0	47		SSW	13	1022.9	20.8	34		SE	6	1021.5
18	We	2.8	23.0	0			ENE	35	14:40	9.4	84		S	2	1025.8	20.7	56		NE	26	1020.5
19	Th	5.9	25.4	0			ESE	22	14:38	10.1	99		NE	2	1020.3	23.0	40		ESE	17	1017.1
20	Fr	5.9	24.7	0			SE	28	13:21	12.7	78		SSE	2	1022.4	21.0	65		ESE	19	1020.3
21	Sa	12.7	21.8	0			NE	24	15:45	15.7	94		Calm	1024.5	19.6	68		ENE	17	1021.8	
22	Su	8.6	24.2	0.2			NE	30	14:46	12.1	99		NE	2	1023.8	20.9	63		NE	20	1020.7
23	Mo	8.3	24.9	0.2			SSE	24	13:19	10.9	99		NNE	4	1021.7	23.9	54		E	15	1018.2
24	Tu	7.5	28.0	0.2			NE	20	13:27	11.0	99		SE	6	1019.5	25.0	56		SE	13	1014.7
25	We	7.9	25.6	0			NE	30	15:45	13.6	97		NE	6	1017.5	24.8	57		ENE	19	1013.2
26	Th	9.6	24.5	0.2			E	30	13:09	14.1	97		Calm	1016.4	22.2	49		ENE	17	1015.1	
27	Fr	9.1	20.2	0			SSW	44	13:55	15.8	52		SW	17	1025.3	19.9	48		S	19	1025.1
28	Sa	4.3	20.9	0			ESE	26	12:42	11.8	76		ENE	7	1028.5	17.9	70		ESE	19	1025.5
29	Su	7.5	20.6	0			SW	33	11:45	11.5	99		NE	6	1027.1	20.2	48		S	7	1024.7
30	Mo	3.5	23.6	0			SE	24	14:37	11.2	86		NE	2	1027.6	21.1	42		ESE	17	1024.7

Statistics for April 2018

Mean	10.7	25.1	0								15.6	80				5	1018.8	23.3	52			17	1015.8
Lowest	2.8	20.2	0								9.4	29		Calm	999.4		17.9	19		SE	6	994.3	
Highest	15.7	36.5	0.2				WNW	93		23.0	99		W	20	1028.5	34.9	73		NW	35	1025.5		
Total			1.2																				

IDCJDW2013.201804 Prepared at 13:00 UTC on Saturday 18 August 2018

0 measurements over 37Km/hr in
either time slot in April

Image 2.7 Bega AWS Jun 2018 Weather Conditions

Bega, New South Wales
June 2018 Daily Weather Observations

		Temps		Rain Evap Sun		Max wind gust				9 am				3 pm							
Date	Day	Min	Max			Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP	
		°C	°C	mm	mm hours		km/h	local	°C	%	g th		km/h	hPa	°C	%	g th		km/h	hPa	
1	Fr	10.2	15.3	0			SW	59	14:29	12.4	61		SW	22	1026.8	14.1	56		SSW	35	1024.6
2	Sa	11.5	15.3	0			SW	50	15:20	13.5	55		SW	28	1023.5	15.1	60		SW	24	1022.4
3	Su	10.2	17.9	0.4			WSW	30	04:00	13.6	76		WSW	6	1023.4	17.1	54		S	9	1020.8
4	Mo	8.4	16.6	0.4			SSW	26	11:52	12.3	92		E	6	1021.9	15.2	68		SE	11	1020.8
5	Tu	2.2	17.6	0.2			SSW	31	13:14	7.7	91		NNE	6	1028.5	16.3	57		ESE	13	1028.1
6	We	7.7	15.1	32.4			WSW	15	06:42	11.4	99		Calm	1033.3	14.4	93		SW	6	1031.7	
7	Th	6.5	19.4	5.8			N	39	13:55	8.0	99		Calm	1031.8	18.4	53		NNE	20	1026.3	
8	Fr	7.8	17.0	0			N	26	01:31	11.5	86		SSW	7	1021.3	16.9	58		N	9	1017.6
9	Sa	9.2	18.6	2.0			SE	20	15:51	9.6	99		Calm	1021.8	17.0	62		WNW	7	1020.4	
10	Su	2.1	17.3	0.2			E	30	13:36	6.7	99		NE	6	1028.6	16.0	68		ESE	11	1026.9
11	Mo	5.7	17.4	2.2			ENE	24	13:52	7.5	99		Calm	1026.1	14.0	74		NE	15	1021.5	
12	Tu	2.3	17.7	0.2			N	20	15:59	6.2	99		SSW	2	1011.4	17.3	62		NNE	2	1005.4
13	We	4.2	16.2	0.6			SSW	13	01:10	7.4	99		NNE	4	1008.8	15.0	72		NNE	2	1006.9
14	Th	3.0	18.4	0			WNW	39	12:51	8.0	81		E	7	1011.9	17.0	33		W	19	1010.0
15	Fr	5.1	20.3	0			W	57	18:11	12.5	62		ESE	6	1008.3	17.0	30		WNW	24	1006.8
16	Sa	8.8	16.5	0			WNW	83	00:22	12.8	32		W	30	1010.3	15.6	28		WNW	30	1008.2
17	Su	-2.2	17.1	0			WSW	48	16:57	11.2	45		NNW	11	1007.0	13.9	45		WSW	22	1007.3
18	Mo	7.5	14.6	22.0			S	52	12:36	12.4	67		SW	28	1018.3	10.8	95		SE	2	1019.9
19	Tu	8.6	15.9	4.2			SW	43	00:23	11.9	72		SW	26	1026.5	12.3	82		SSW	11	1026.2
20	We	3.9	16.8	0.6			NNE	9	02:02	7.1	98		Calm	1030.2	15.6	48		N	4	1027.7	
21	Th	-0.5	17.2	0.2			ESE	20	15:35	2.5	99		Calm	1029.5	16.2	43		E	9	1026.2	
22	Fr	-1.4	16.3	0			E	17	14:45	1.5	99		S	6	1029.0	14.7	60		E	13	1025.5
23	Sa	-1.1	15.4	0.2			NNE	13	14:41	-0.1	99		Calm	1025.9	14.7	48		NNE	11	1023.0	
24	Su	-0.1	15.6	0			WSW	41	12:02	8.1	78		W	9	1028.0	14.4	42		WSW	30	1025.8
25	Mo	-2.8	16.6	0			W	22	11:44	2.7	92		Calm	1031.5	16.0	40		NE	6	1029.4	
26	Tu	-2.0	15.9	0			SE	24	13:54	1.8	99		Calm	1035.1	15.0	62		E	13	1031.9	
27	We	1.8	18.0	0			NNE	31	14:38	7.1	99		NE	4	1033.3	17.0	55		NE	15	1028.9
28	Th	5.7	12.4	3.8			N	19	22:38	8.7	99		Calm	1026.2	12.2	99		WSW	6	1021.9	
29	Fr	6.2	17.6	16.8			ENE	17	15:08	8.1	99		Calm	1018.9	15.8	62		E	7	1016.5	
30	Sa	-0.5	17.6	0.2			W	52	12:03	5.1	93		NNE	4	1017.9	16.8	33		WSW	20	1016.6

Statistics for June 2018

Mean	4.3	16.8									8.3	85				7	1023.2	15.4	58			13	1020.8
Lowest	-2.8	12.4	0								-0.1	32		Calm	1007.0		10.8	28		#	2	1005.4	
Highest	11.5	20.3	32.4					WNW	83		13.6	99		W	30	1035.1	18.4	99		SSW	35	1031.9	
Total			92.4																				

IDCJDW2013.201806 Prepared at 16:00 UTC on Thursday 16 August 2018

Image 2.9 Bega AWS Aug 2018 Weather Conditions

Bega, New South Wales
August 2018 Daily Weather Observations

		Temps		Rain	Evap	Sun	Max wind gust				9 am				3 pm						
Date	Day	Min	Max	mm	mm	h	Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C					km/h		°C	%	g ^h		km/h	hPa	°C	%	g ^h		km/h	hPa
1	We	2.2	18.2	0			SW	39	12:57	9.1	68		ENE	2	1016.3	17.6	27		SW	19	1017.4
2	Th	-0.6	17.5	0			NNE	39	11:41	3.3	87		Calm	1026.2	15.6	58		NE	26	1019.6	
3	Fr	0.8	18.9	0			N	44	20:35	3.7	97		Calm	1015.3	18.3	57		NE	20	1006.7	
4	Sa	3.7	21.3	0			NNW	54	03:58	15.7	33		W	19	1010.7	19.9	24		NW	17	1010.9
5	Su	2.5	19.6	0			ENE	28	16:10	5.7	86		Calm	1015.2	18.2	51		E	17	1008.4	
6	Mo	1.2	19.1	0			WSW	63	13:24	17.8	35		NNW	19	1000.1	17.3	28		W	33	997.1
7	Tu	9.9	17.3	0			W	65	09:47	12.4	37		W	33	1003.8	16.1	26		W	31	1005.7
8	We	-0.1	20.6	0.8			NW	39	12:46	6.2	94		SSW	6	1010.8	18.7	32		NW	22	1007.7
9	Th	-0.2	17.0	0			ENE	28	12:25	5.9	80		Calm	1023.1	15.9	50		NE	19	1019.8	
10	Fr	-2.2	22.2	0.2			N	30	12:51	2.6	99		Calm	1017.4	21.2	24		N	13	1012.0	
11	Sa	2.3	24.6	0			NNW	65	12:26	17.4	30		N	13	1006.4	22.5	21		NW	19	1002.1
12	Su	1.0	16.5	0			WSW	52	09:27	11.2	45		SW	24	1015.4	15.8	26		SW	17	1014.8
13	Mo	8.4	21.2	0			SW	67	10:42	15.1	42		SW	33	1018.7	20.8	30		WSW	11	1016.9
14	Tu	-0.4	22.3	0			SE	20	13:56	9.2	71		NE	2	1021.5	21.5	35		ENE	13	1015.1
15	We	0.3	23.9	0			W	85	15:22	19.0	27		W	26	1006.1	20.4	31		W	37	1003.1
16	Th	7.5	19.5	0			SSW	39	11:55	14.1	43		SSE	7	1010.5	18.6	20		SSW	13	1009.0
17	Fr	-1.3	16.7	0			ENE	26	13:02	5.4	83		Calm	1015.6	15.2	40		ENE	13	1011.1	
18	Sa	-2.6	16.4	0			W	59	14:41	6.7	76		N	6	1006.9	13.1	52		WSW	31	1005.3
19	Su	6.6	12.3	0			WSW	74	09:32	11.6	42		W	30	1008.5	10.2	58		WSW	39	1011.6
20	Mo	5.5	14.9	0.8			WSW	52	10:57	9.3	55		SW	15	1020.5	13.6	37		WSW	13	1017.1
21	Tu	3.2	18.8	0			SW	54	10:17	11.5	56		SSE	6	1012.4	18.5	32		SW	15	1008.2
22	We	6.1	16.9	0			SW	35	03:11	11.4	58		SSW	11	1016.2	14.9	45		ESE	20	1015.0
23	Th	-1.0	17.6	0			NE	33	14:17	4.0	99		Calm	1022.1	15.4	52		NE	22	1019.9	
24	Fr	0.4	18.7	0			ENE	30	12:56	10.7	78		ESE	6	1024.6	15.3	62		NE	17	1022.6
25	Sa	2.9	19.5	0			ENE	31	13:08	5.9	99		S	7	1023.6	17.4	65		NE	22	1016.9
26	Su	4.0	18.2	0.2			SE	28	13:04	8.4	99		ENE	6	1017.1	15.6	63		ESE	17	1013.7
27	Mo	3.4	14.0	0			SSW	59	15:35	10.3	50		SSW	22	1022.5	12.4	36		SW	31	1022.4
28	Tu	-2.1	13.7	0.2			SW	44	11:44	8.6	55		SW	17	1023.0	12.5	45		S	30	1018.4
29	We	4.1	15.6	0			SW	54	08:49	9.9	50		WSW	31	1019.2	14.6	32		SSW	26	1017.4
30	Th	-2.8	16.4	0			E	22	13:28	5.9	66		NE	7	1021.6	14.4	49		ENE	13	1016.5
31	Fr	4.9	17.7	0			SW	59	19:08	10.2	70		SW	2	1007.6	12.9	66		N	24	995.9

Statistics for the first 31 days of August 2018

Mean	2.3	18.3								9.6	64			11	1015.4	16.6	41			21	1012.2
Lowest	-2.8	12.3	0							2.6	27		Calm	1000.1	10.2	20	WSW	11	995.9		
Highest	9.9	24.6	0.8				W	85		19.0	99		#	33	1026.2	22.5	66	WSW	39	1022.6	
Total			2.2																		

IDCJDW2013.201808 Prepared at 23:36 UTC on Friday 31 August 2018

1 measurement over 37Km/hr in either time slot in August

Image 3.1 Bega AWS Oct 2018 Weather Conditions

Bega, New South Wales
October 2017 Daily Weather Observations

		Temps		Rain		Evap		Sun		Max wind gust						9 am				3 pm			
Date	Day	Min Max		mm	mm	hours	Dir	Spd		Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP	
		°C	°C					km/h	local														°C
1	Su	1.9	21.6				E	31	13:46	9.4	69			ENE	2	1021.2	19.7	41		ENE	22	1018.1	
2	Mo	6.2	21.2				ENE	35	12:52	11.0	81			S	4	1025.3	20.2	57		NE	20	1021.4	
3	Tu	9.9	23.3				SE	37	14:19	14.0	84			SSW	7	1022.4	22.5	63		SE	22	1017.9	
4	We	9.6	23.0				NE	31	14:32	14.6	88			NE	6	1023.1	20.0	56		NE	22	1019.7	
5	Th	7.0	18.5				SSW	30	12:12	9.7	99			S	4	1016.6	18.1	74		N	6	1013.0	
6	Fr	9.7	20.9				SSW	63	12:04	16.1	49			SW	22	1014.5	18.2	51		SSW	26	1016.9	
7	Sa	9.8	20.0				SW	28	00:24	15.2	57			WSW	13	1023.7	18.4	59		E	17	1022.0	
8	Su	6.3	23.2				NE	28	12:24	13.0	84			S	7	1017.9	22.2	59		ENE	19	1012.2	
9	Mo	12.8	29.0				WSW	76	11:29	18.2	89			ENE	4	1007.9	20.3	67		SE	24	1006.6	
10	Tu	5.3	20.7				NE	35	13:41	13.2	81			E	2	1017.9	18.4	61		ENE	22	1015.9	
11	We	12.5	26.6				ENE	46	13:09	16.4	79			S	9	1015.4	25.2	56		NE	33	1008.2	
12	Th	15.8	22.9				ESE	43	11:39	18.6	57			SSW	22	1008.1	20.1	50		ESE	20	1009.7	
13	Fr	6.2	22.8				SE	39	15:18	13.5	76			ENE	4	1018.0	21.5	36		E	17	1016.0	
14	Sa	9.4	20.6				E	33	12:06	15.7	49			SSE	6	1025.1	19.2	47		ESE	22	1023.6	
15	Su	4.0	24.1				E	35	13:18	11.6	80			ENE	7	1025.6	22.6	45		ENE	22	1023.1	
16	Mo	7.0	25.1				NE	43	14:22	14.0	87			SSE	4	1028.0	23.8	51		ENE	28	1024.4	
17	Tu	7.9	26.7				NE	43	13:38	13.2	99			Calm	1026.8	24.7	51		NE	31	1023.1		
18	We	7.8	26.5				NE	48	14:06	16.1	77			SE	6	1026.1	24.6	55		NE	33	1022.0	
19	Th	10.8	30.1				NE	30	12:07	19.1	74			SSE	7	1020.1	28.2	47		NE	13	1015.1	
20	Fr	14.2	19.9				SW	41	13:02	14.8	70			SSW	17	1021.7	19.0	50		SSW	17	1021.8	
21	Sa	3.4	19.7				ESE	31	14:32	12.6	54			SSW	20	1024.0	18.2	44		NE	19	1018.6	
22	Su	10.1	21.0				SSW	37	08:59	15.4	50			SSW	13	1015.2	20.0	42		SW	20	1013.0	
23	Mo	4.3	23.6				SE	33	15:00	13.0	91			ENE	7	1018.1	22.0	48		E	20	1015.0	
24	Tu	9.3	25.6				SE	39	13:04	15.6	75			S	7	1017.1	21.5	57		ESE	20	1014.2	
25	We	13.7	21.4				E	44	13:14	15.3	94			Calm	1012.7	19.3	77		ESE	26	1009.8		
26	Th	13.4	17.4				SE	35	15:58	14.8	99			SSW	9	1009.2	16.3	94		SSE	11	1006.7	
27	Fr	14.1	21.4				NE	30	18:06	16.8	83			SW	15	1012.8	19.4	73		NE	11	1011.0	
28	Sa	11.5	25.5				ESE	33	14:57	16.9	90			S	6	1008.5	24.2	61		ESE	22	1006.2	
29	Su	15.9	28.7				NE	43	15:33	18.5	93			ENE	4	1006.8	27.9	46		NE	24	1001.5	
30	Mo	11.7	19.7				SW	39	19:33	18.8	69			E	20	1001.6	14.5	96		ESE	9	1004.5	
31	Tu	10.6	18.7				SSW	56	14:01	13.6	53			SW	20	1017.1	18.5	45		SSW	31	1014.9	

Statistics for October 2017

Mean	9.4	22.9								14.8	76			8	1017.7	20.9	56			20	1015.0
Lowest	1.9	17.4								9.4	49		Calm	1001.6	14.5	36	N	6	1001.5		
Highest	15.9	30.1				WSW	76			19.1	99		#	22	1028.0	28.2	96	NE	33	1024.4	
Total																					

IDCJDW2013.201710 Prepared at 13:00 UTC on Friday 10 August 2018

Conclusion

When comparing the historic data from the **Australian Bureau of Meteorology (ABM)** for a direct comparison of **the ten months operational period** of the flight college using the maximum wind component of the proposed training aircraft there are:

- only **5 readings** from the ABM for the ten month period **equal or exceed 21 knots (37Km/hr)** - the maximum wind component for the training aircraft.
- The operational procedure for the Flight College is to deliver **flight training on 15 days of the month** (Mondays to Fridays) with limited remedial training on Saturdays.
- The flight training reality, given the historic weather data from the ABM and the operational maximum wind component of the training aircraft, is that there are only a possible **maximum of five days when flight operations would not be conducted.**

Wind in most cases is viewed by pilots as a positive given that the headwind component during takeoffs and landings permits slower speeds and shorter landing and take-off distances.

Mitch Boyle

Senior Flight Instructor