ADCP Report
St Andrews Bay
For
Mara seaweed

20TH FEBRUARY 2022

Summary

Introduction:

To enhance the understanding of hydrodynamic processes at a potential seaweed aquaculture site in St Andrews Bay, an ADCP was deployed during the period from 09/12/2021 to 09/01/2022. Deployment and recovery were carried out from Tayport Harbour at 56°27.075'N 002°52.820'W.

ADCP type and setup: Due to the shallow water depth of around 25 m it was decided to deploy a 500 Hz Nortek AWAC sensor programmed to measure waves, currents and surface elevation at alternating intervals. The sensor with instrument ID WPR2280 and Head ID WAV6312 was running on firmware version 3.37AST and was recording data on to an internal SD card.

Current profiles were measured over 11 bins at 2.0 m bin sizes every 10 minutes and averaged over a 60 s period. Wave samples were recorded every hour at 2 Hz sample rate for a period of 512 s. A temperature and also pressure reading to capture water depth was taken every 10 minutes. The ADCP head was distanced 0.5 m away from the seabed, and a blanking distance of 1.0 m was used to give a distance for CELL1 from the seabed ranging from 1.0 m to 2.0 m. The vertical and horizontal accuracies of the ADCP are given for the deployment settings as 0.7 cms^{-1} and 2.2 cms^{-1} respectively. A picture of the ADCP mounted inside a gimballed frame and prior to loading on to the deployment craft is shown in Figure 1. The ADCP was connected to a 60 m line with interim clump weights and a small creel buoy as surface marker.

On recovery the data was processed using Nortek Storm and MS Excel and was corrected for the magnetic variation of 2°W (2021).

Figure 1 – ADCP and deployment craft on 09 December 2021.

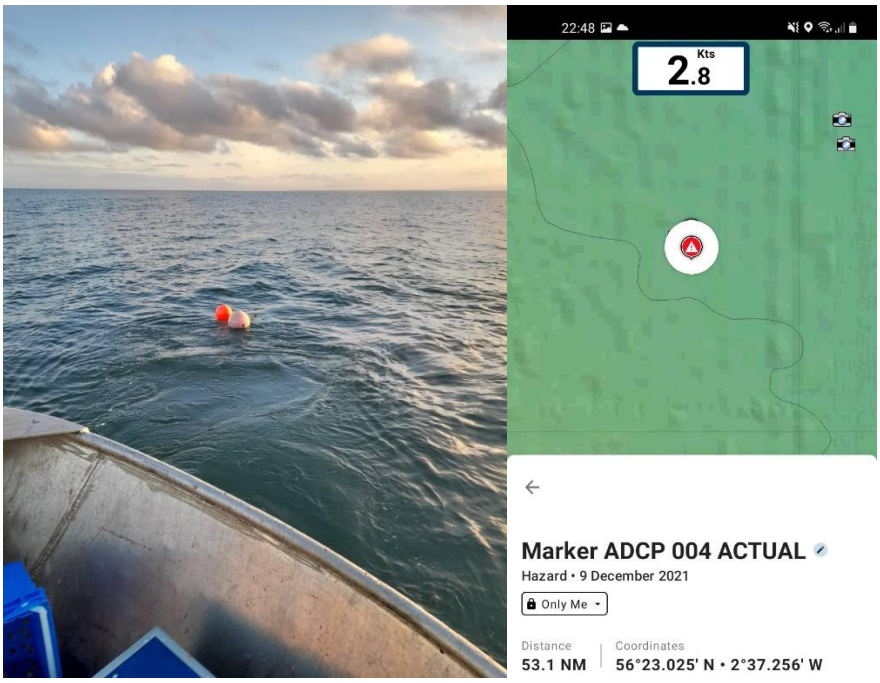


Figure 2 – Actual position of ADCP deployment and marker buoy.

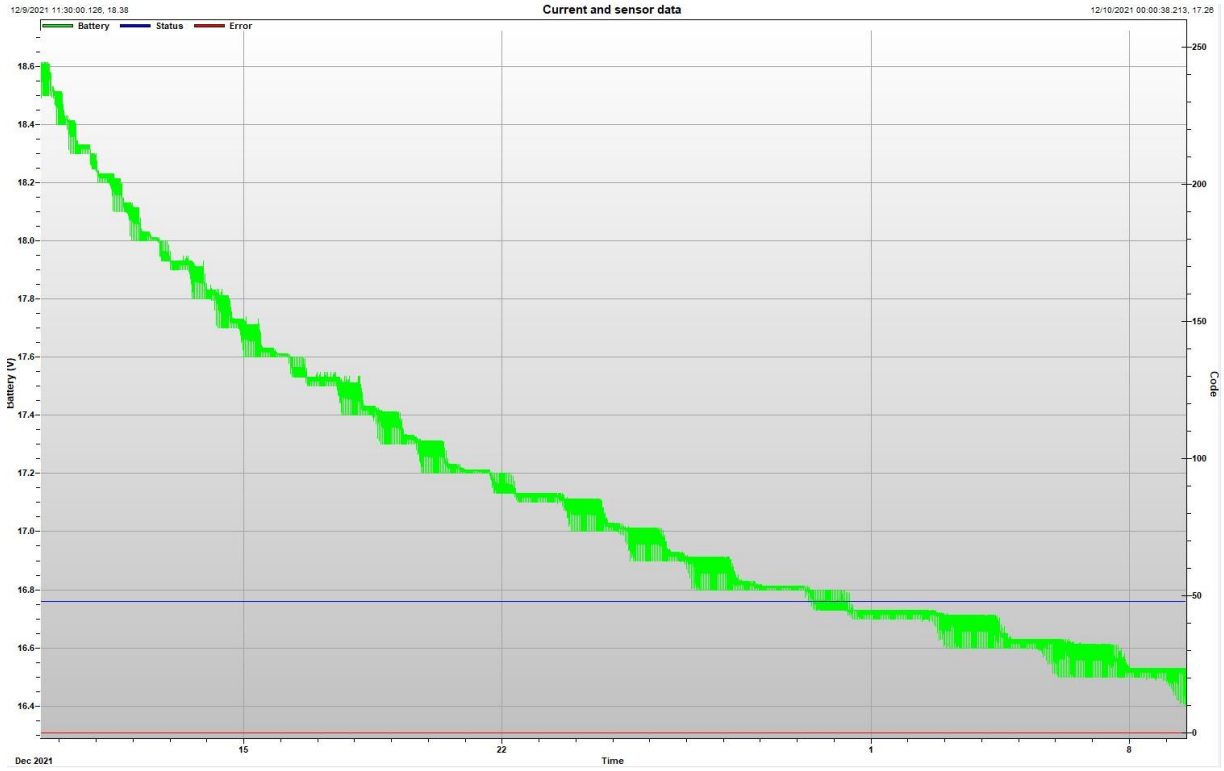


Figure 3 – Record of Battery performance during duration of deployment.

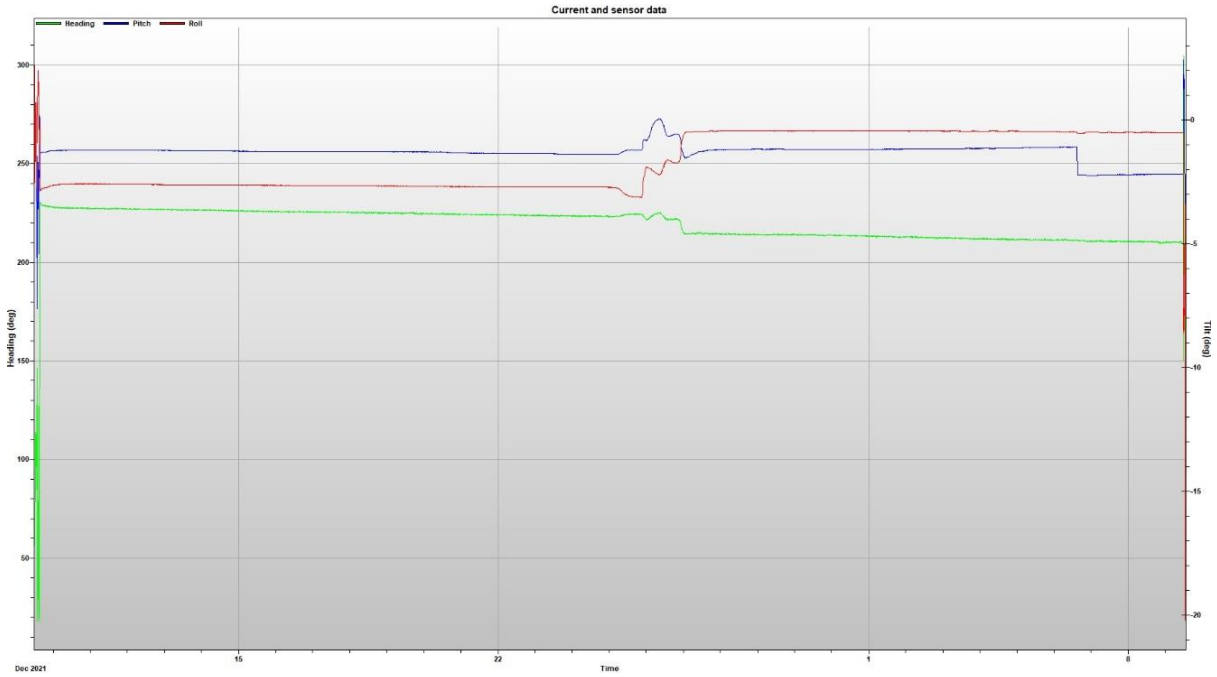


Figure 3 – Record of instrument pitch, roll & heading during duration of deployment.

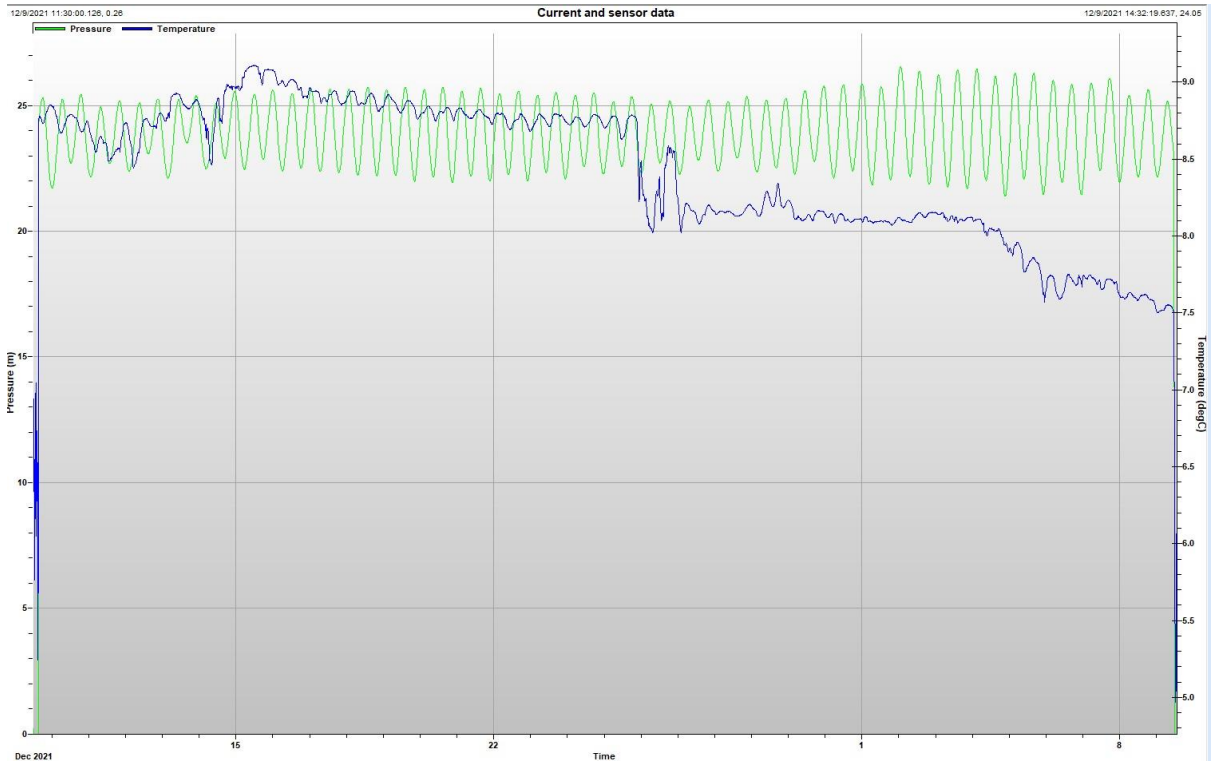
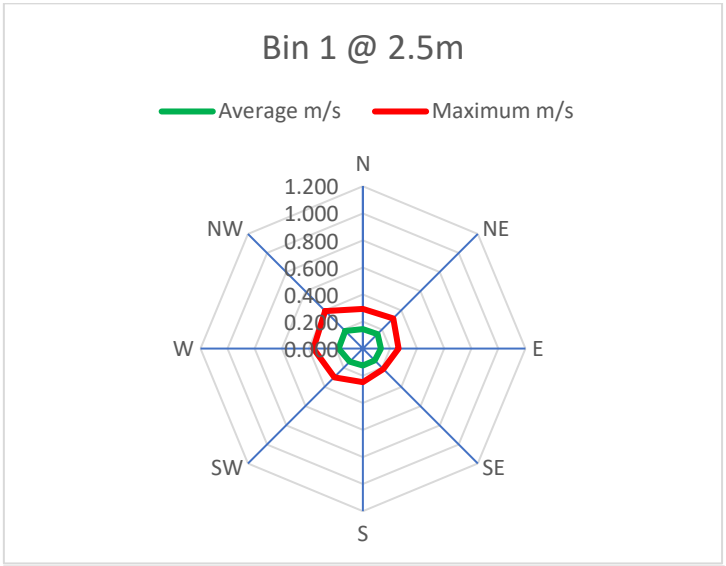
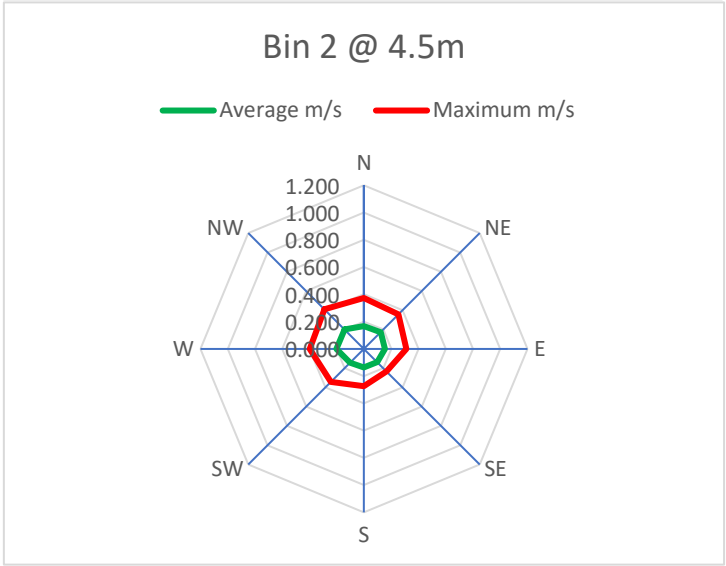
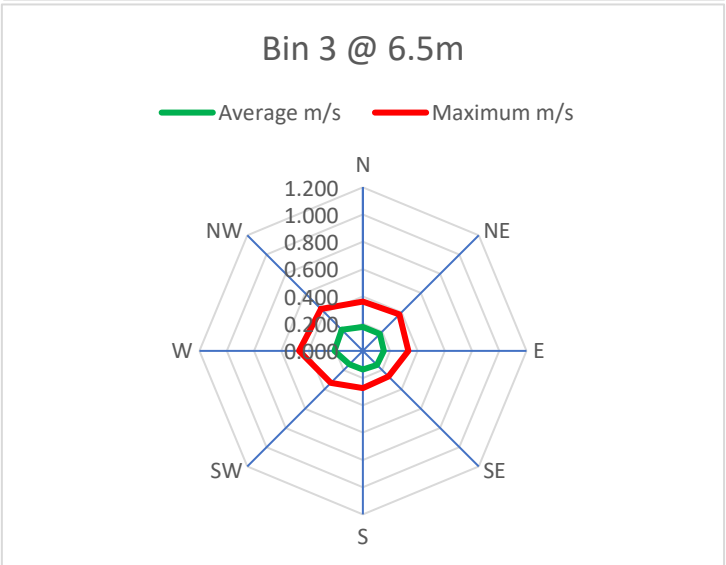
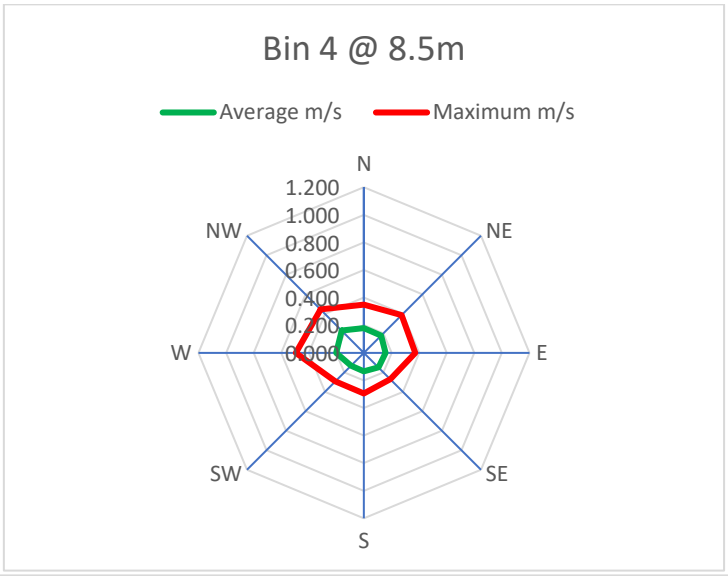


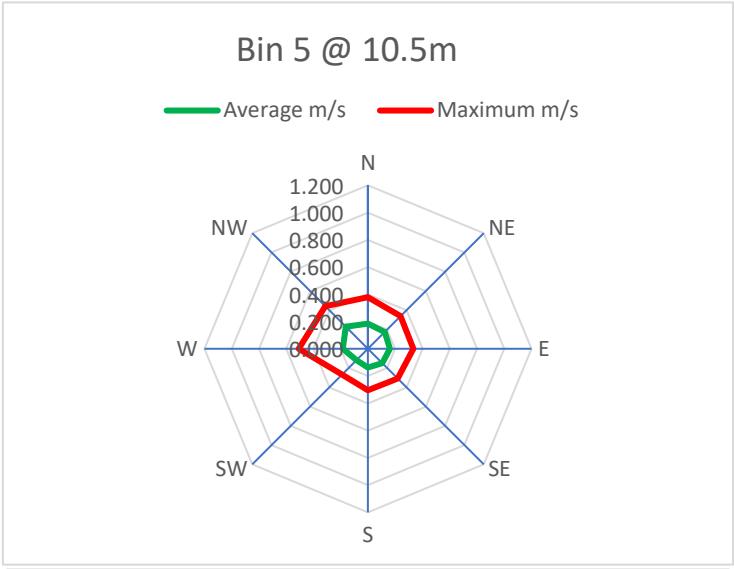
Figure 3 – Record of water temperature and pressure (depth) during duration of deployment.

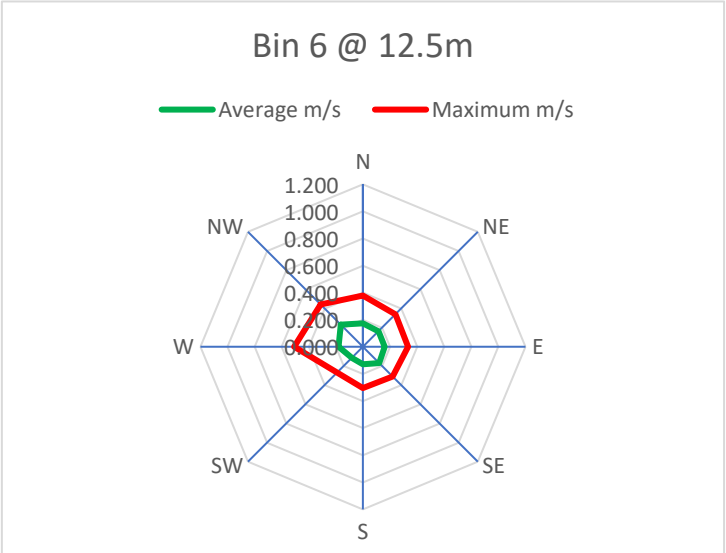

Bin 1 @ 2.5m
Average m/s
Maximum m/s
N
NE
E
SE
S
SW
W
NW
1.200
1.000
0.800
0.600
0.400
0.200
0.000

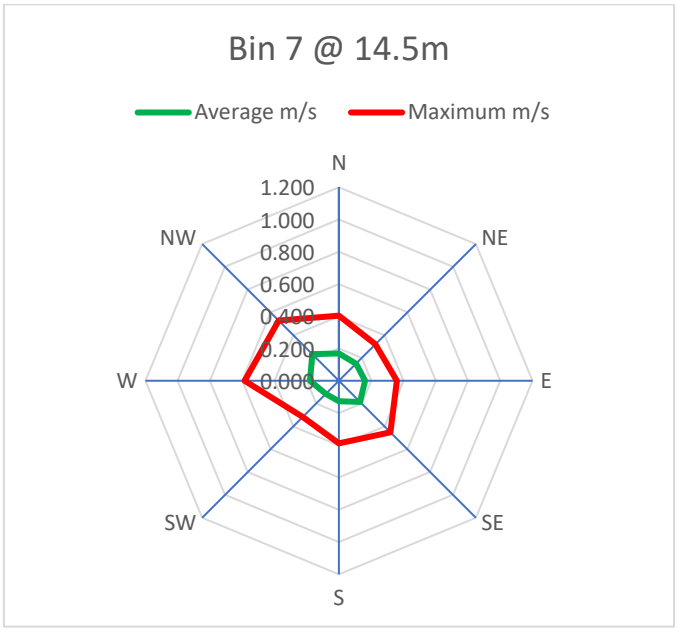

Bin 2 @ 4.5m
Average m/s
Maximum m/s
N
NE
E
SE
S
SW
W
NW
1.200
1.000
0.800
0.600
0.400
0.200
0.000

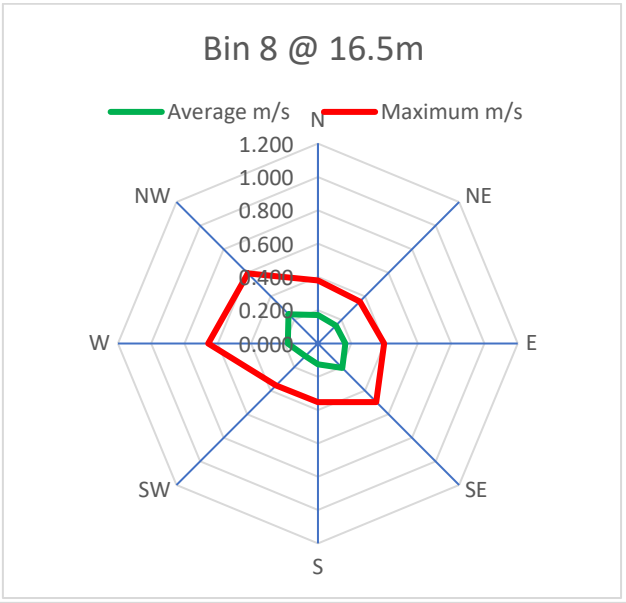

Bin 3 @ 6.5m
Average m/s
Maximum m/s
N
NE
E
SE
S
SW
W
NW
1.200
1.000
0.800
0.600
0.400
0.200
0.000

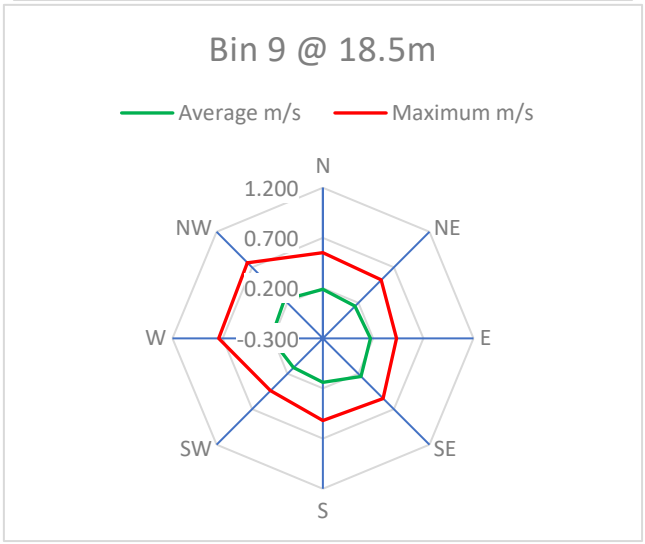

Bin 4 @ 8.5m
Average m/s
Maximum m/s
N
NE
E
SE
S
SW
W
NW
1.200
1.000
0.800
0.600
0,400
0.200
0.000

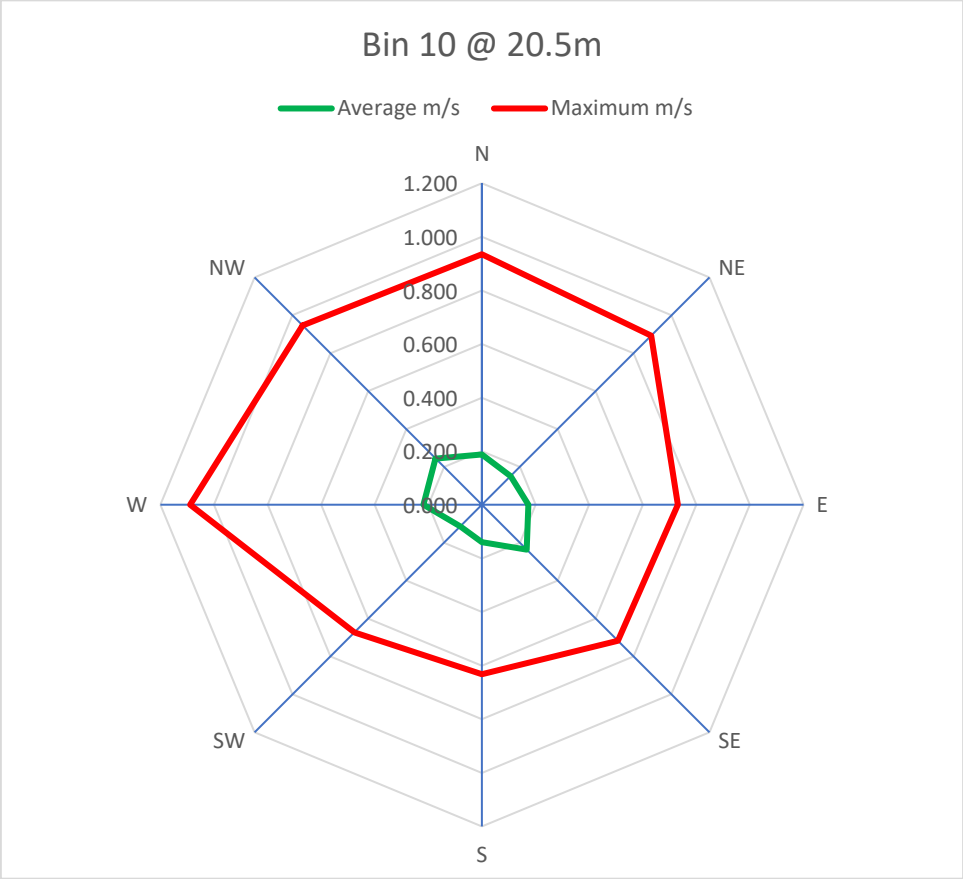

Bin 5 @ 10.5m
Average m/s
Maximum m/s
N
NE
E
SE
S
SW
W
NW
1.200
1.000
0.800
0.600
0,400
0.200
0.000


Bin 6 @ 12.5m
Average m/s
Maximum m/s
N
NE
E
SE
S
SW
W
NW
1.200
1.000
0.800
0.600
0,400
0.200
0.000

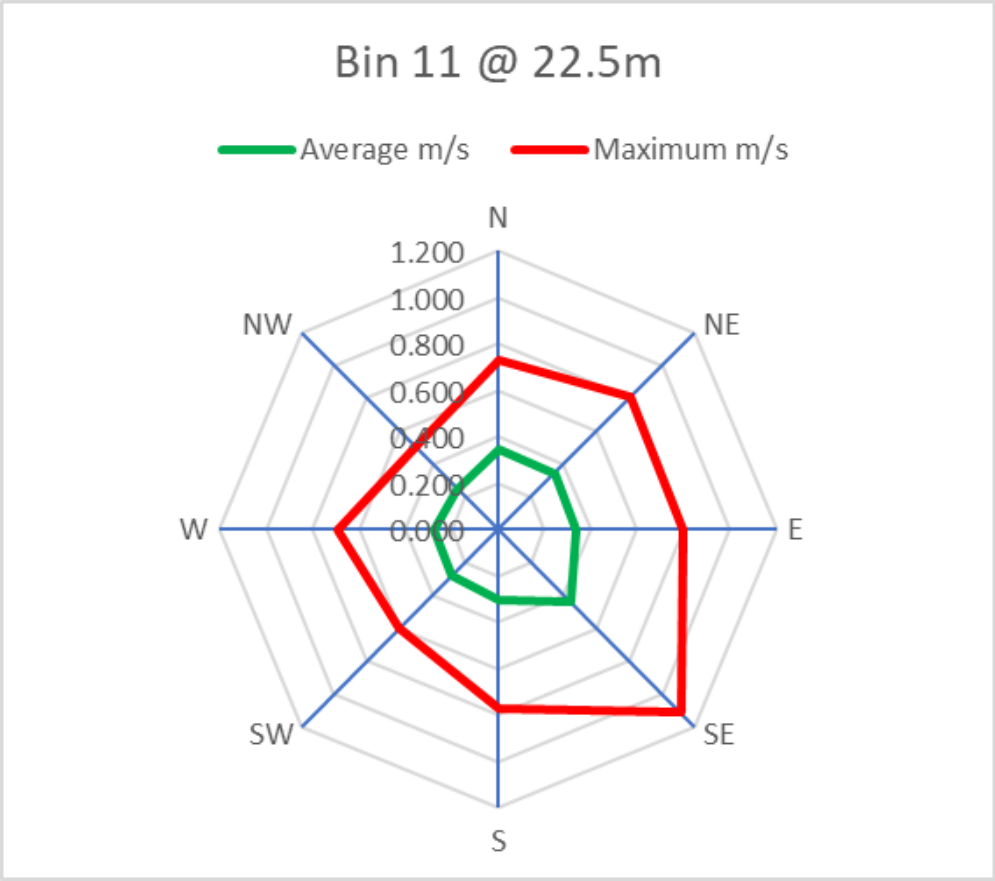

Bin 7 @ 14.5m
Average m/s
Maximum m/s
N
NE
E
SE
S
SW
W
NW
1.200
1.000
0.800
0.600
0.400
0.200
0.000


Bin 8 @ 16.5m
Average m/s
Maximum m/s
N
NE
E
SE
S
SW
W
NW
1.200
1.000
0.800
0.600
0.400
0.200
0.000


Bin 9 @ 18.5m
Average m/s
Maximum m/s
N
NE
E
SE
S
SW
W
NW
1.200
0.700
0.200
-0.300



Bin 10 @ 20.5m		Ave m/s	Kts	Max m/s	Kts
N	337.5-22.5	0.351	0.68	0.935	1.81
NE	22.5-67.5	0.265	0.51	0.893	1.73
E	67.5-112.5	0.219	0.43	0.731	1.42
SE	112.5-157.5	0.290	0.56	0.717	1.39
S	157.5-202.5	0.227	0.44	0.632	1.23
SW	202.5-247.5	0.198	0.38	0.673	1.31
W	247.5-292.5	0.306	0.59	1.089	2.11
NW	292.5-337.5	0.297	0.58	0.946	1.84



Bin 11 @ 22.5m		Ave m/s	Kts	Max m/s	Kts
N	337.5-22.5	0.347	0.67	0.730	1.42
NE	22.5-67.5	0.344	0.67	0.806	1.56
E	67.5-112.5	0.336	0.65	0.794	1.54
SE	112.5-157.5	0.439	0.85	1.111	2.16
S	157.5-202.5	0.304	0.59	0.767	1.49
SW	202.5-247.5	0.281	0.54	0.602	1.17
W	247.5-292.5	0.278	0.54	0.689	1.34
NW	292.5-337.5	0.246	0.48	0.503	0.98