



*Supplement of*

**Interannual variability in the Australian carbon cycle over 2015–2019, based on assimilation of Orbiting Carbon Observatory-2 (OCO-2) satellite data**

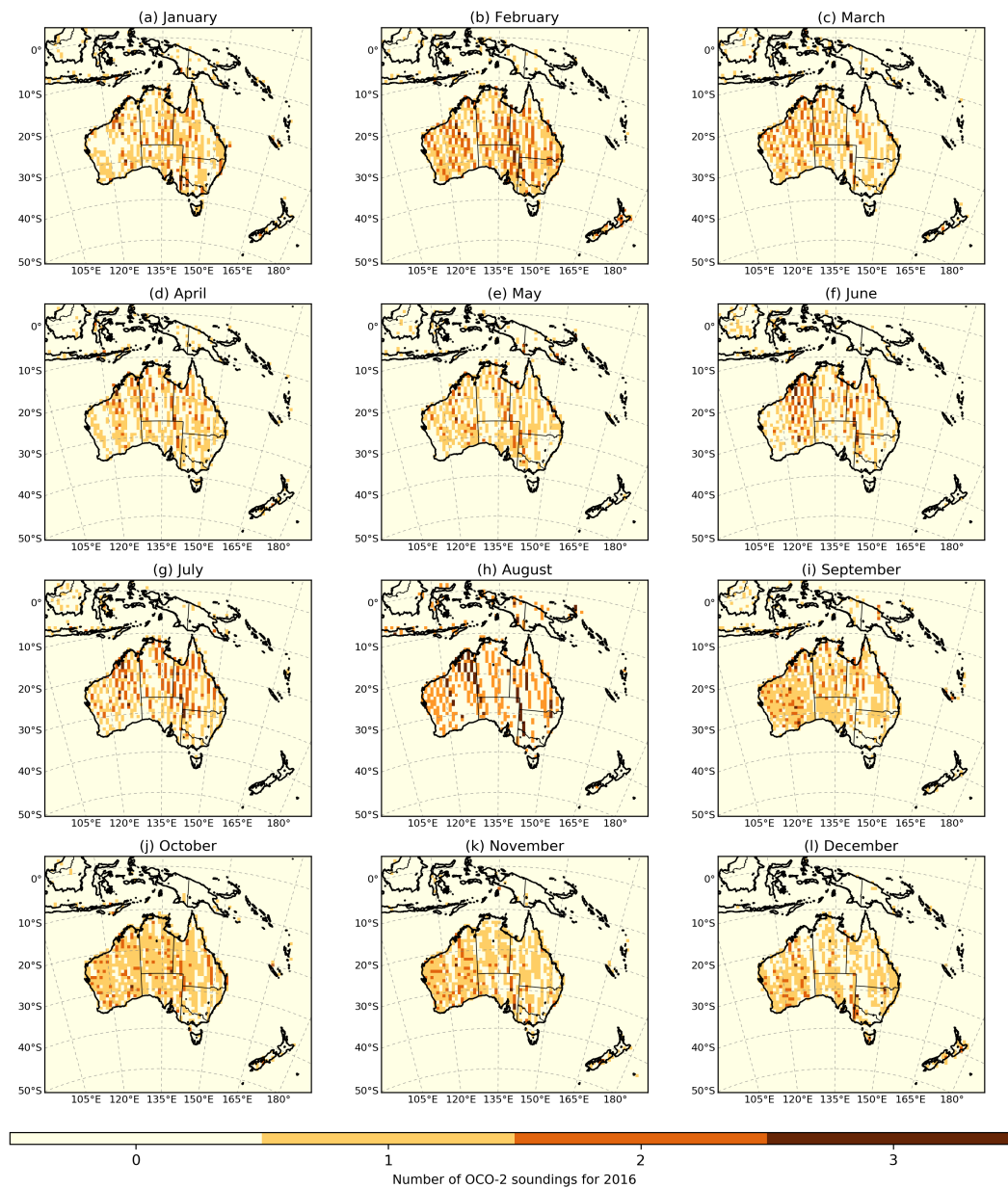
**Yohanna Villalobos et al.**

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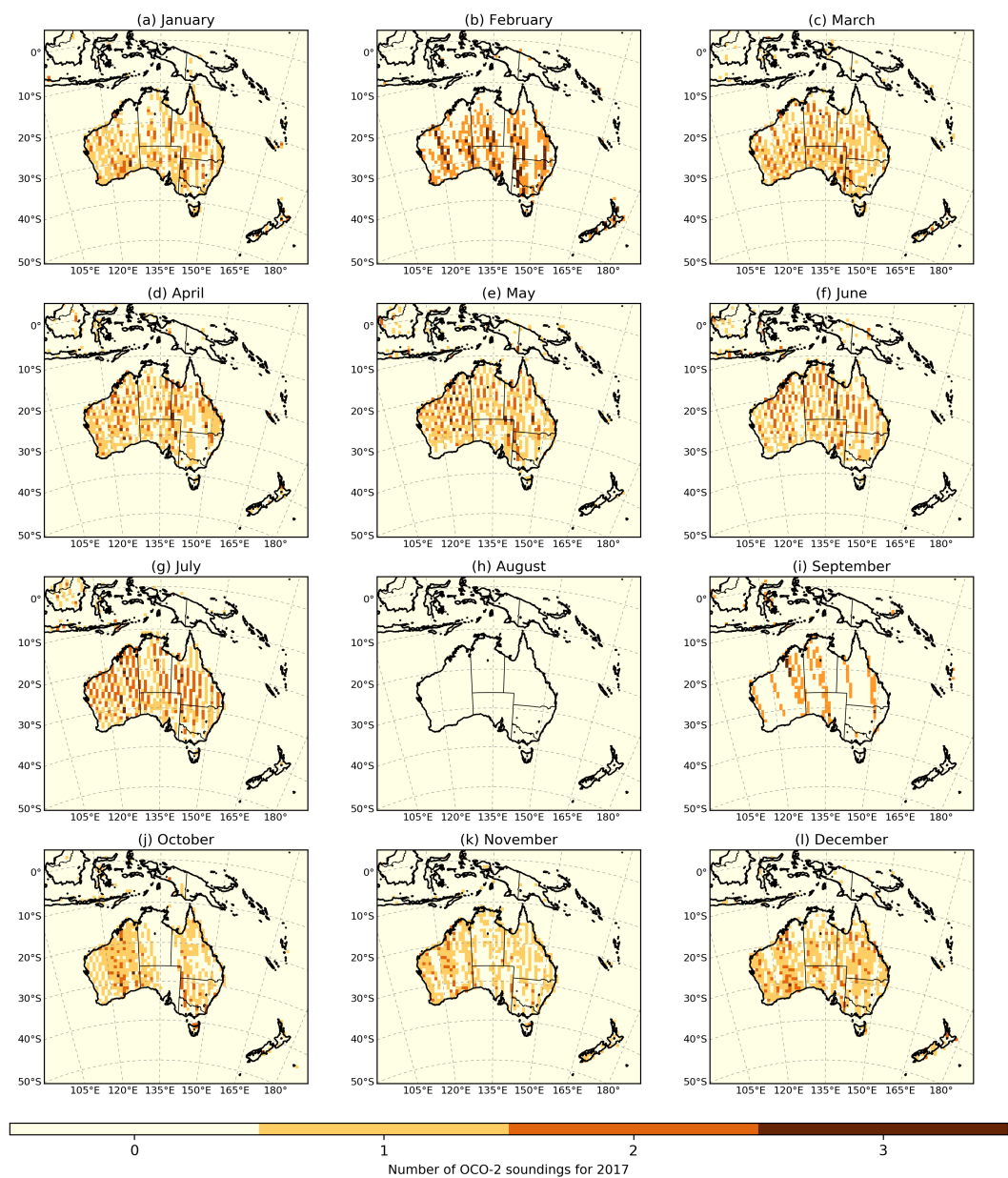
# Supplementary material

## 1 Spatial maps of OCO-2 soundings over Australia domain

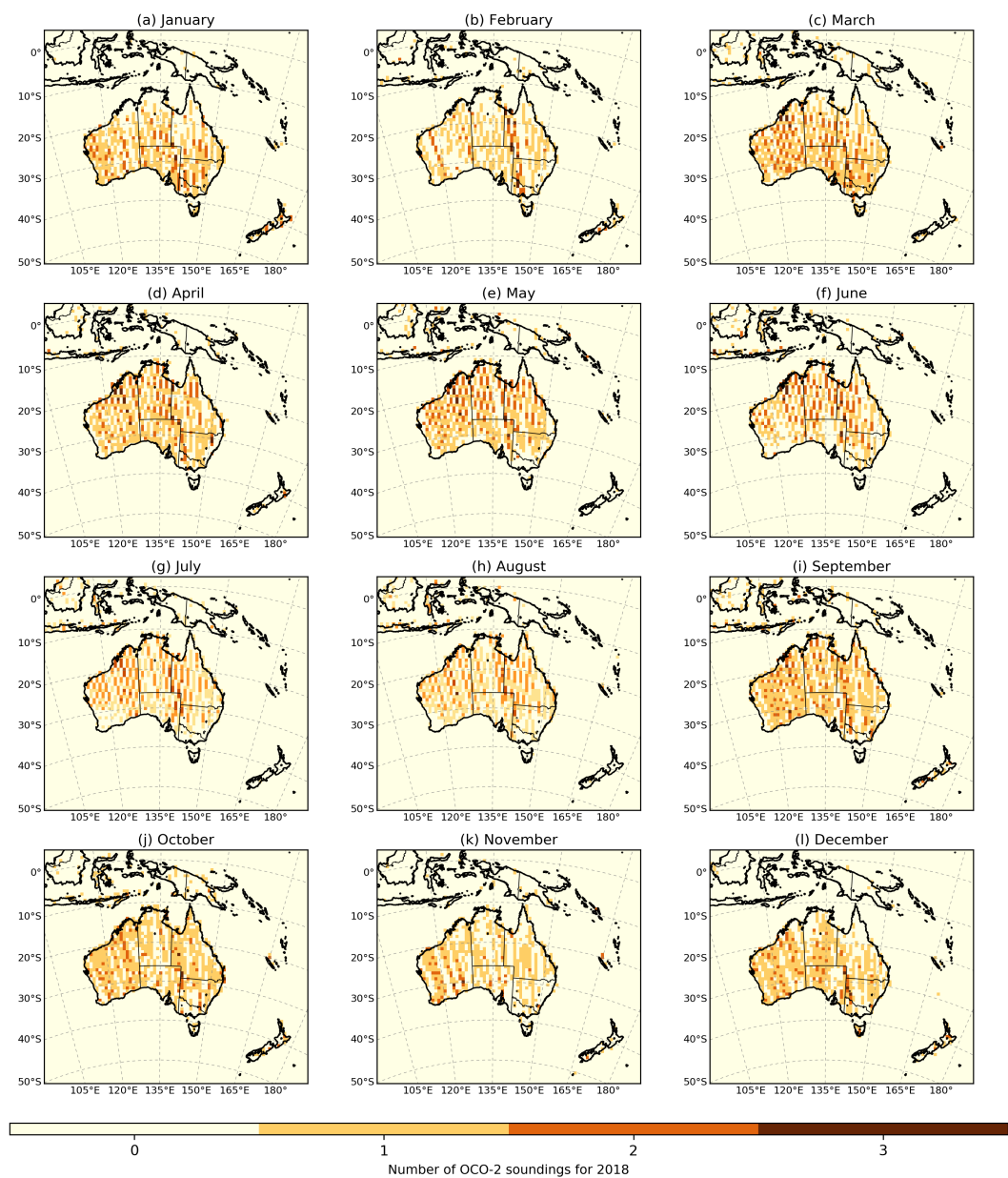


**Figure S1.** Spatial distribution of OCO-2 soundings (Land nadir and glint data) over the CMAQ domain for 2016.

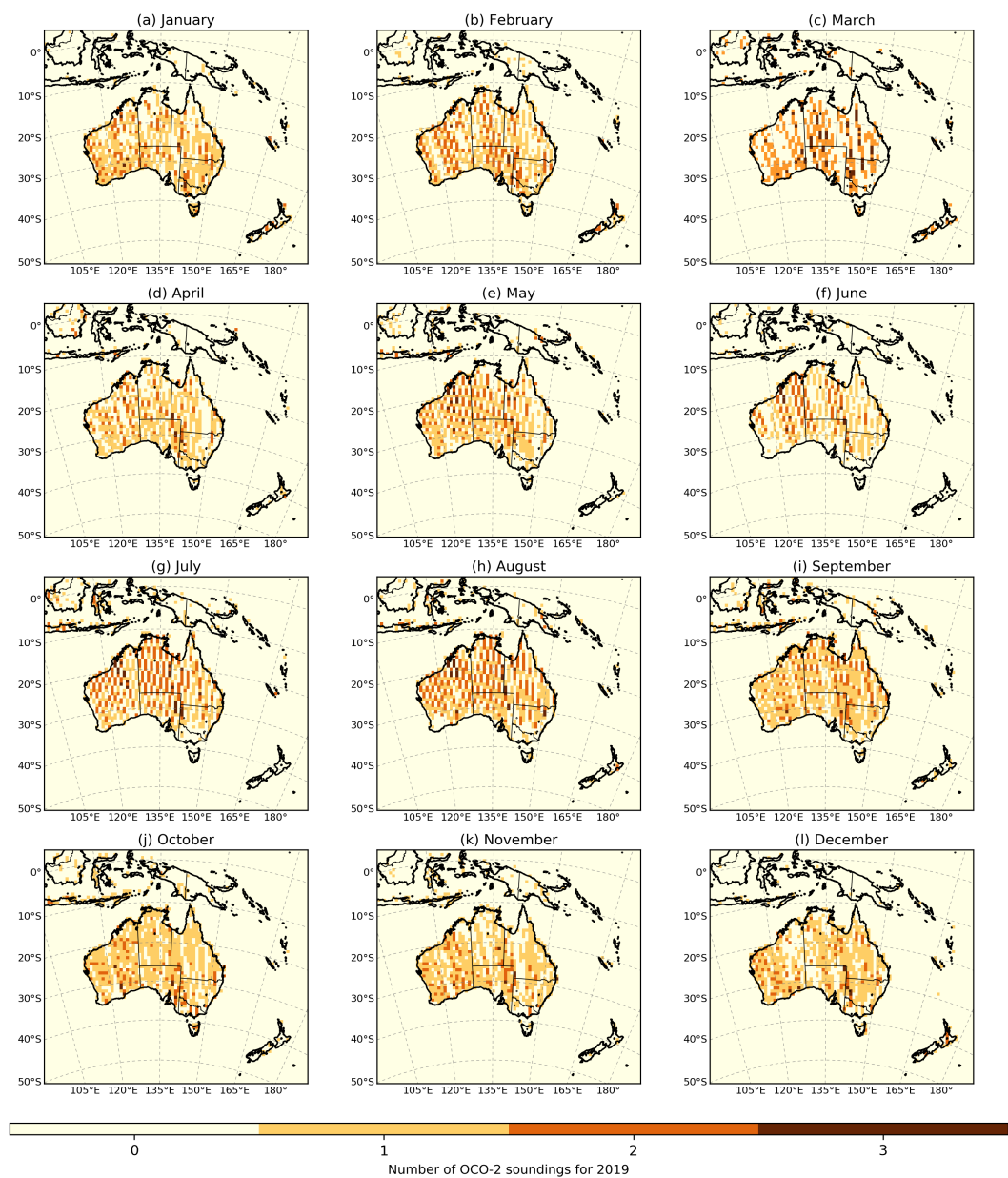




**Figure S2.** Spatial distribution of OCO-2 soundings (Land nadir and glint data) over the CMAQ domain for 2017.



**Figure S3.** Spatial distribution of OCO-2 soundings (Land nadir and glint data) over the CMAQ domain for 2018.



**Figure S4.** Spatial distribution of OCO-2 soundings (Land nadir and glint data) over the CMAQ domain for 2019.

2 Wind direction analysis

2.1 Wind directions at TCCON sites

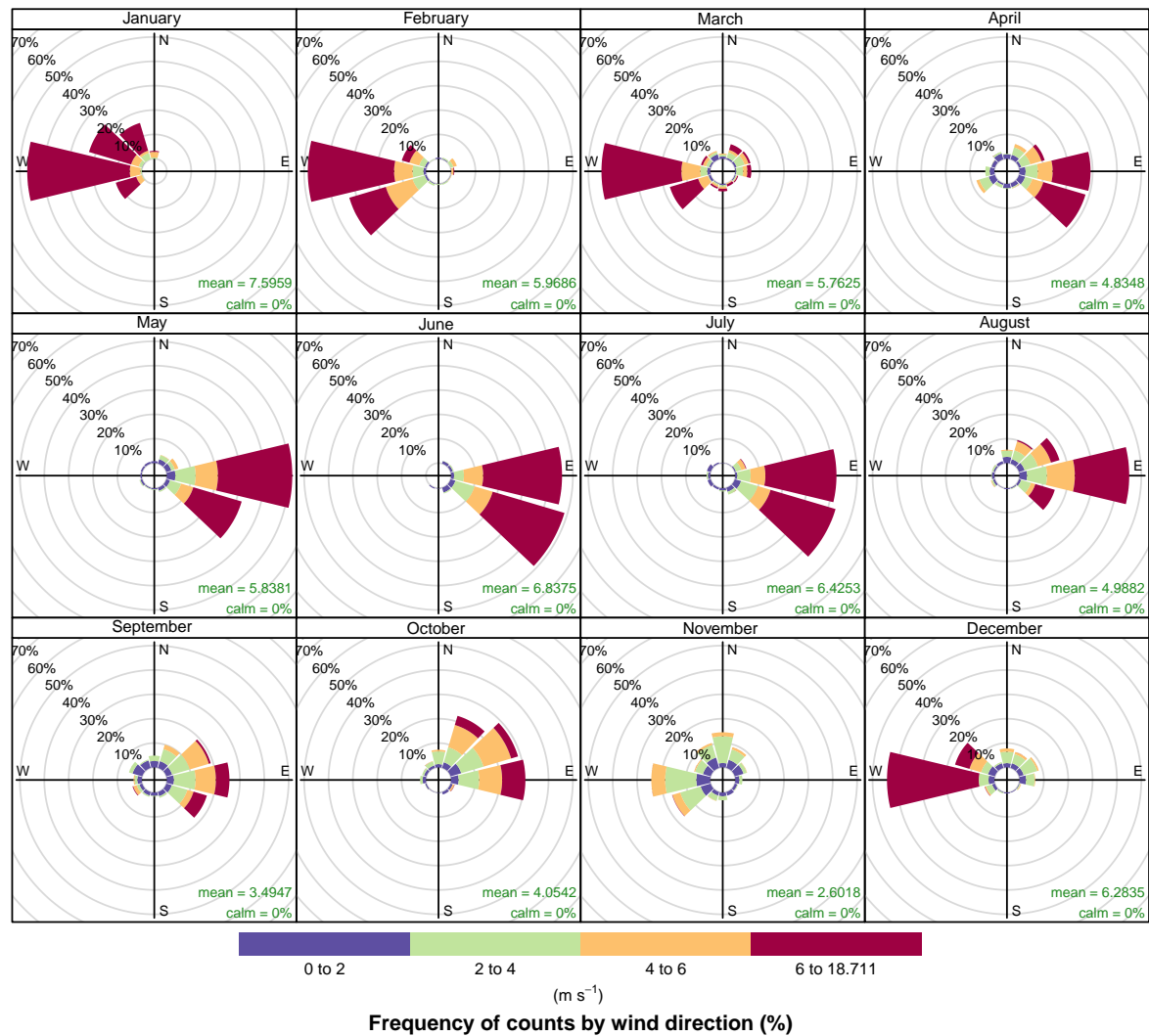
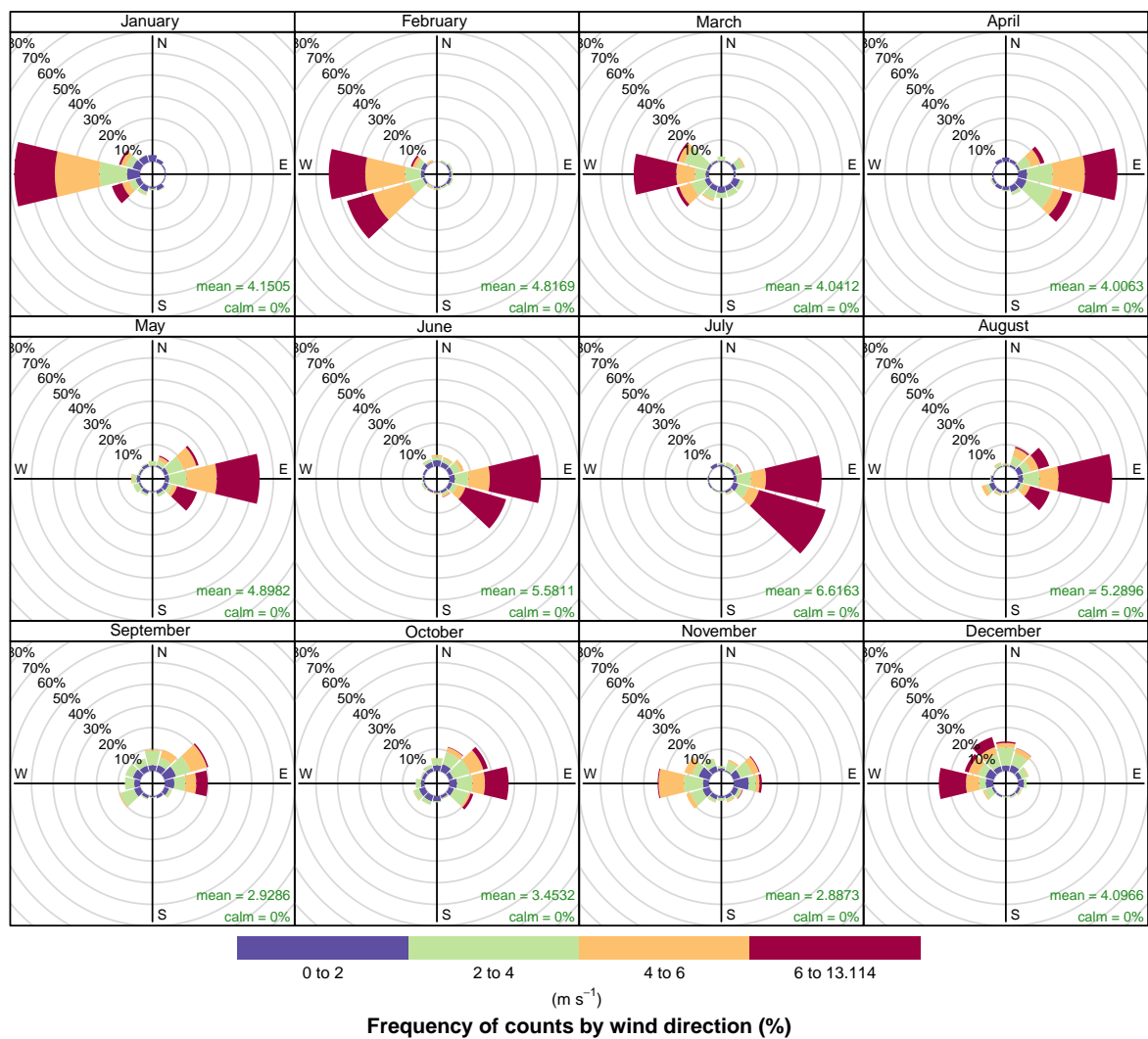
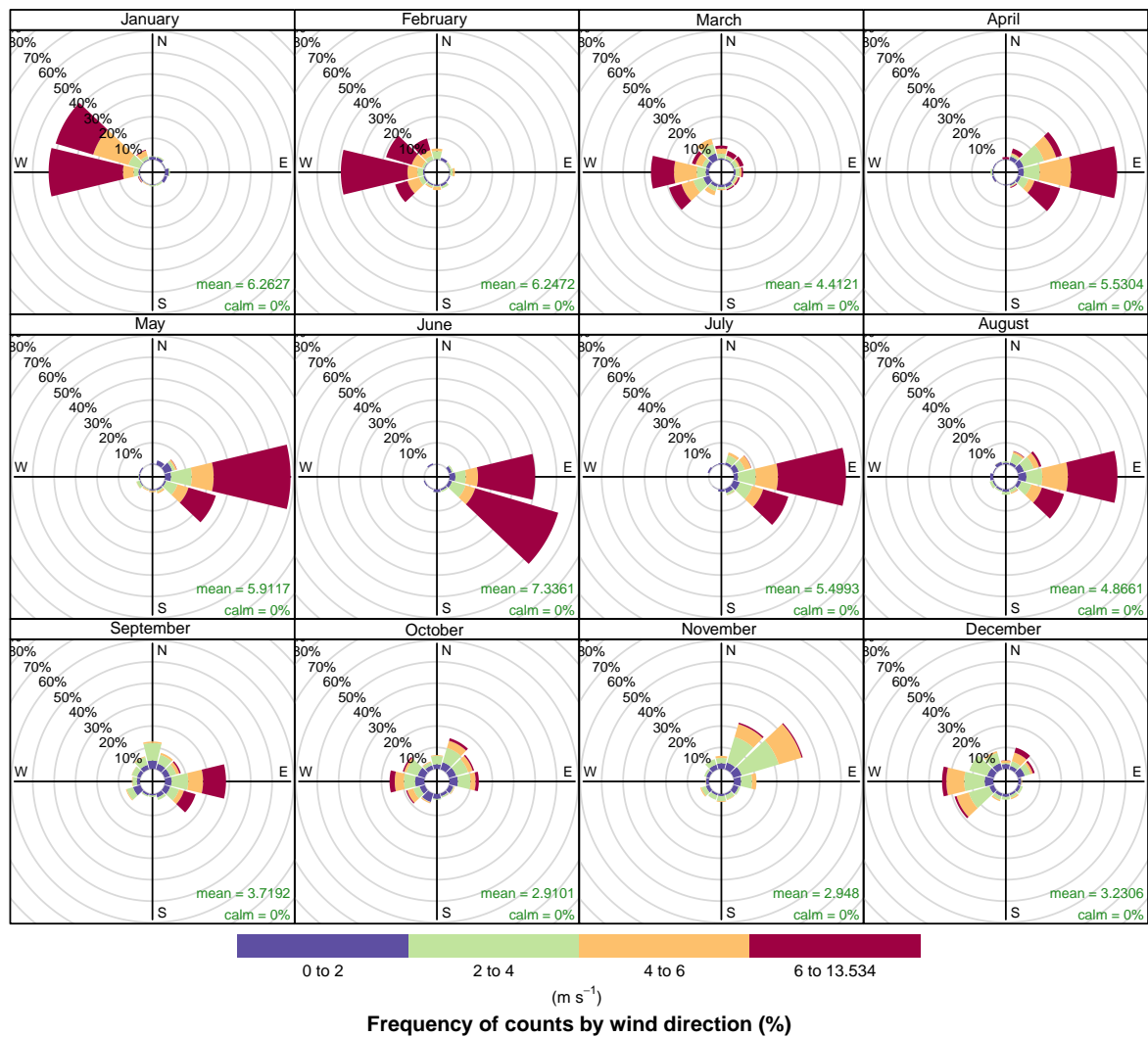


Figure S5. Wind rose TCCON Darwin location for 2015.

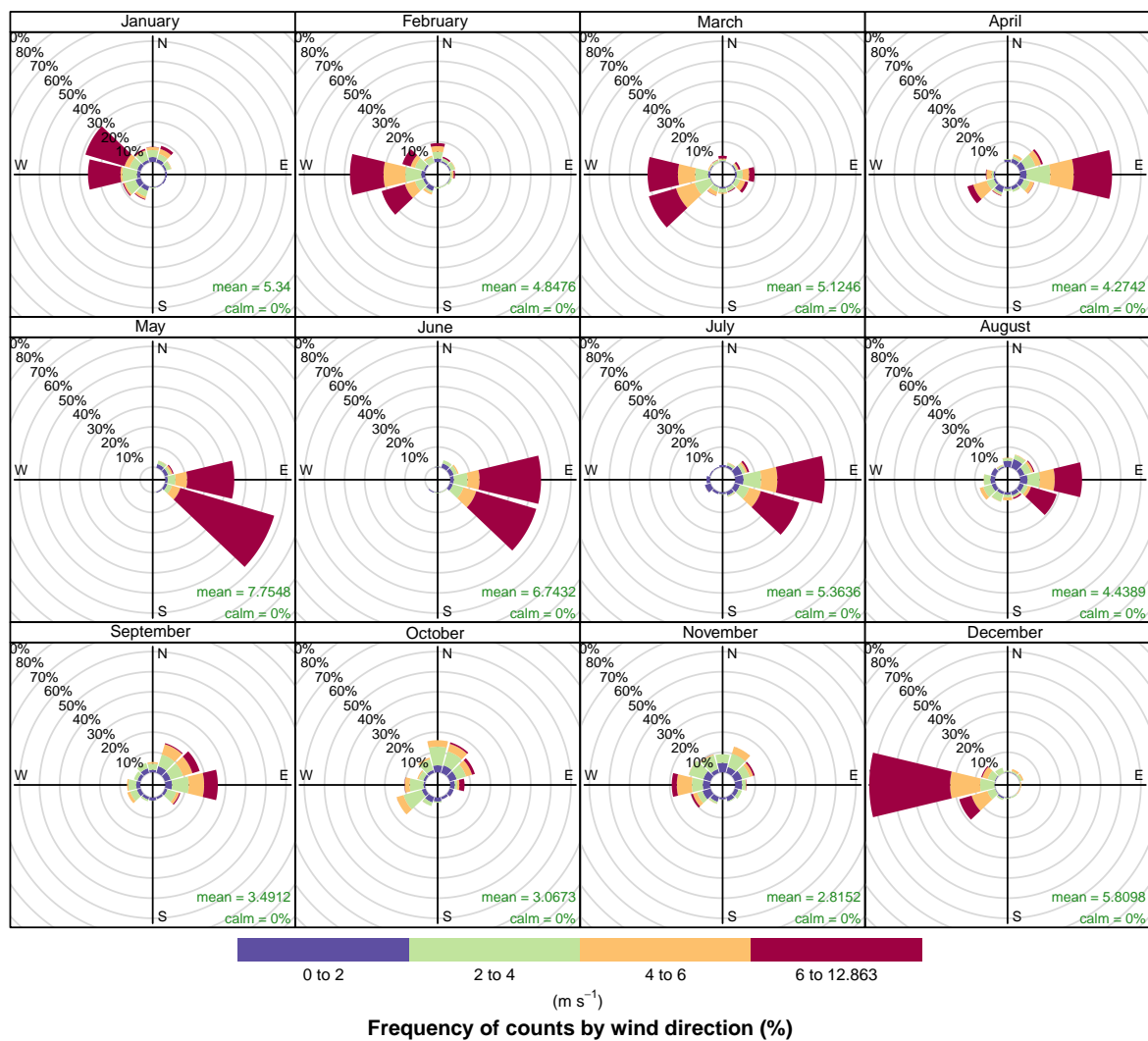


**Figure S6.** Wind rose TCCON Darwin location for 2016.

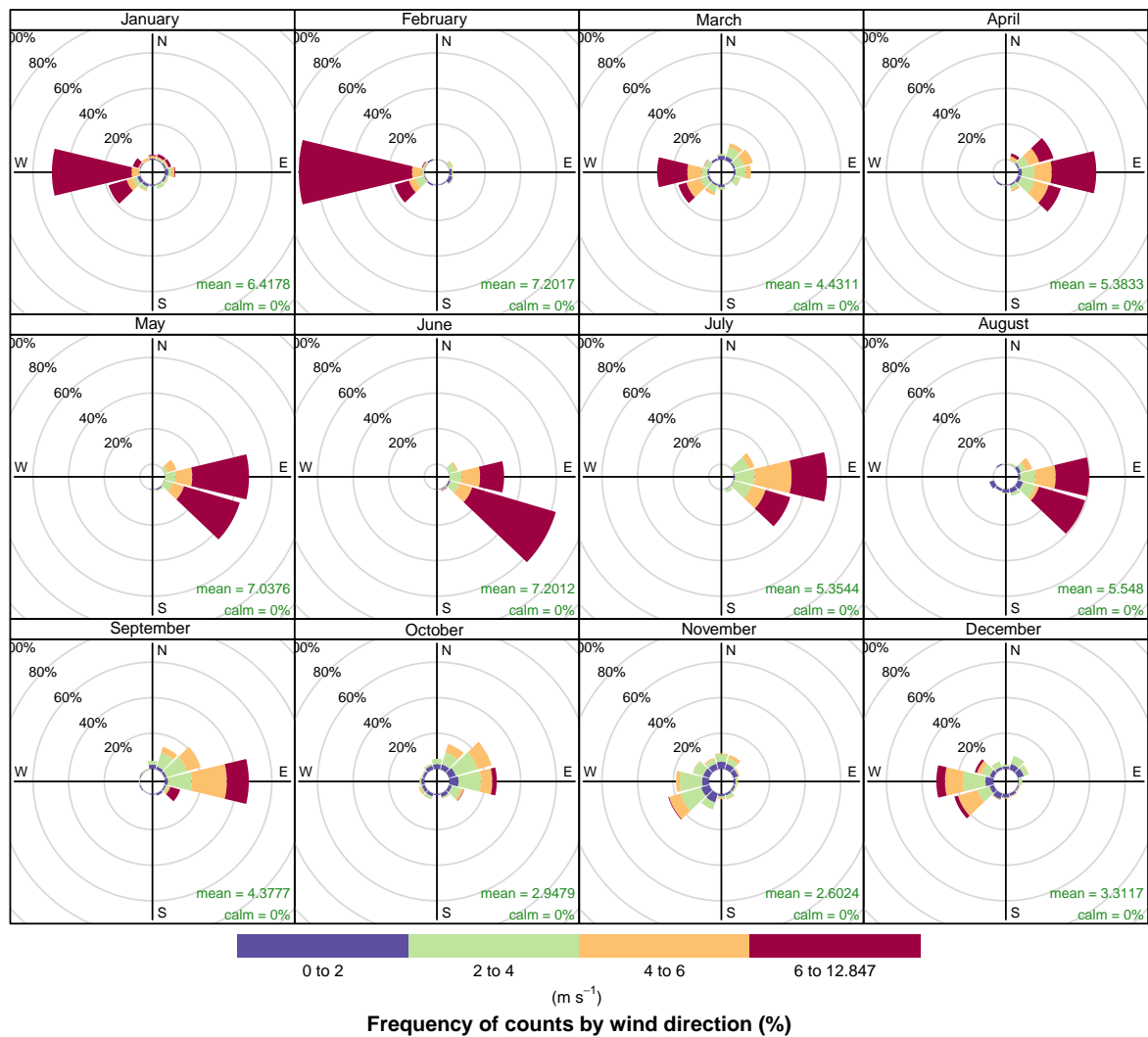


**Figure S7.** Wind rose TCCON Darwin Location for 2017.



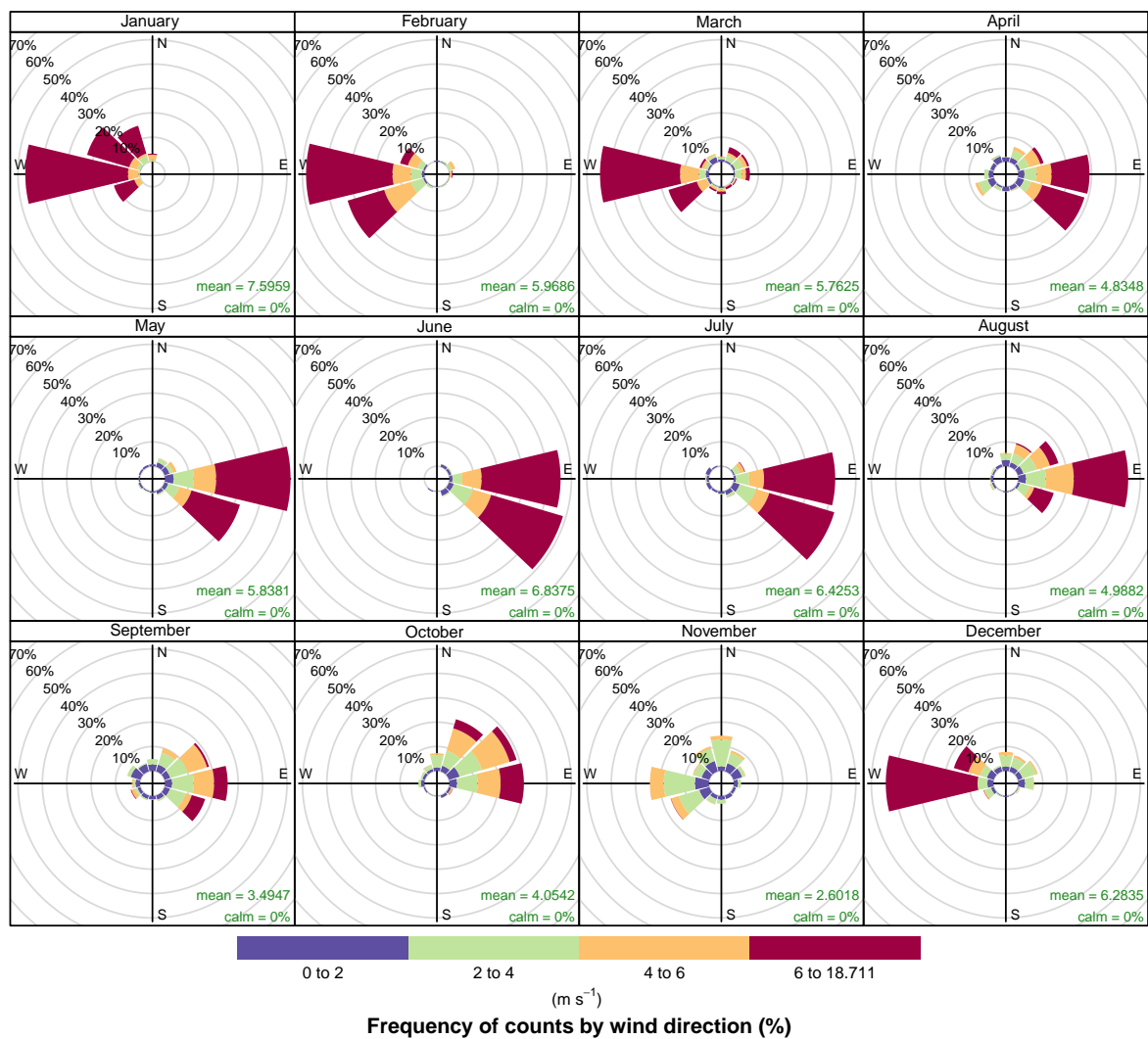


**Figure S8.** Wind rose TCCON Darwin Location for 2018.

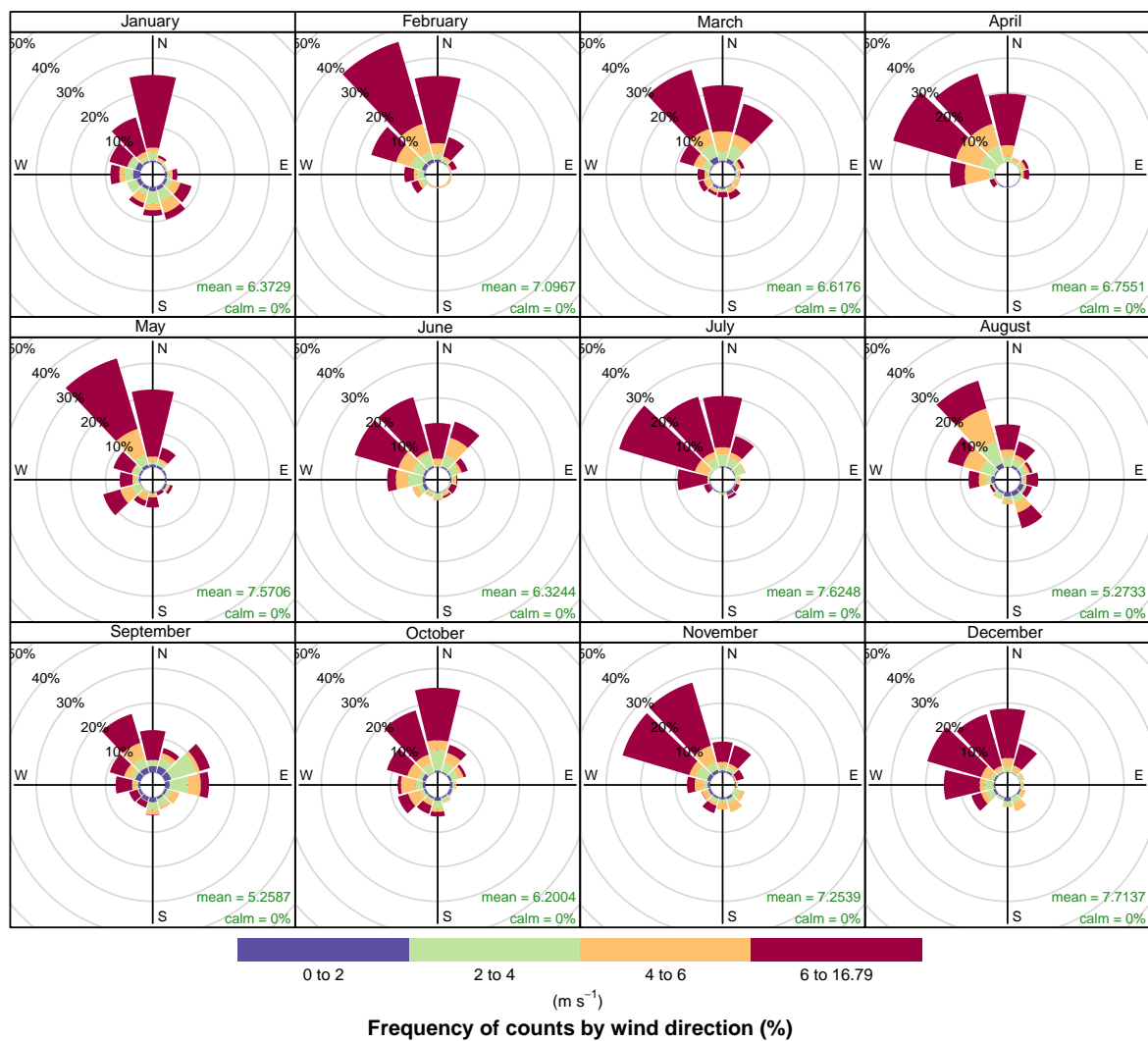


**Figure S9.** Wind rose TCCON Darwin Location for 2019.

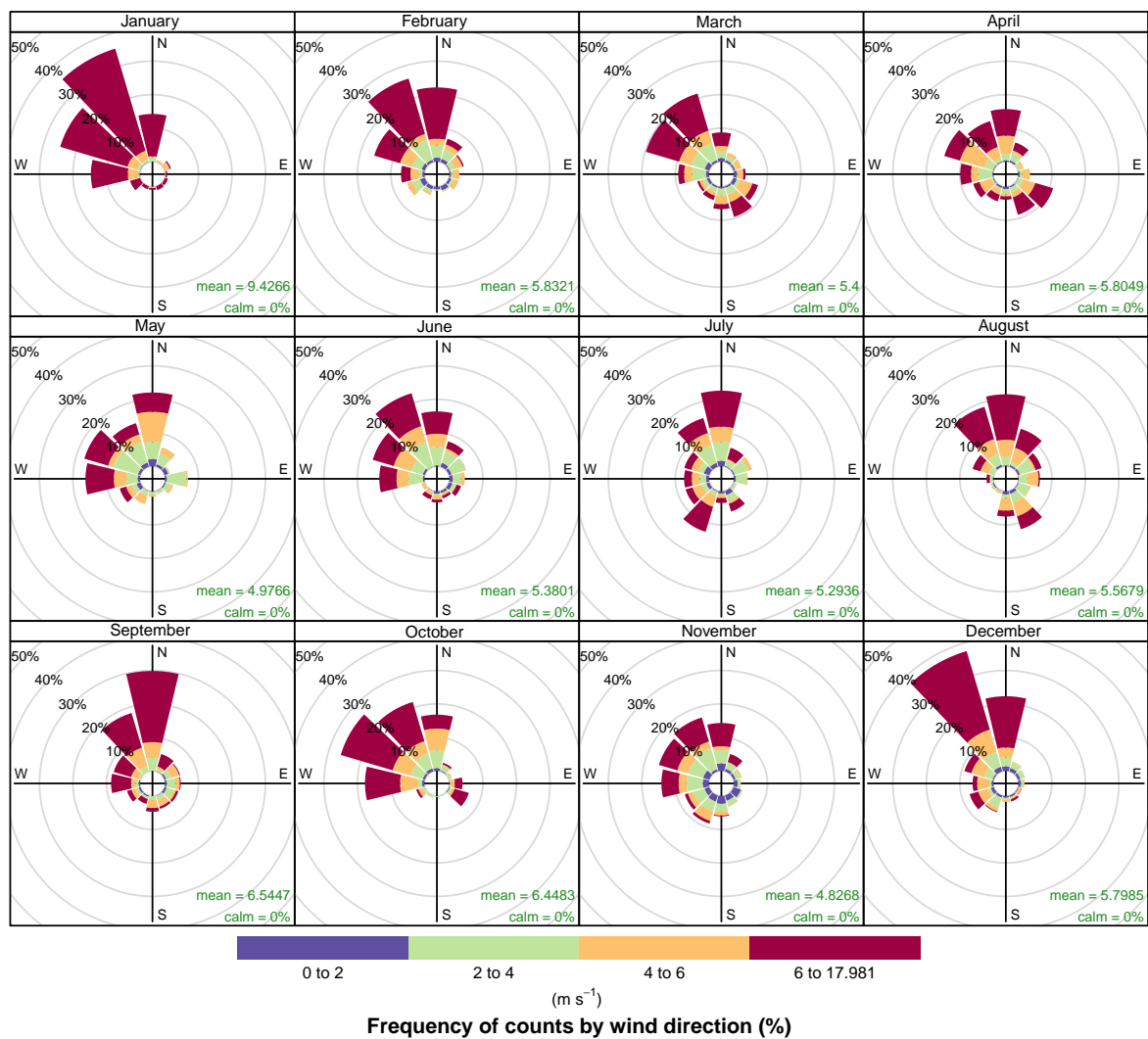




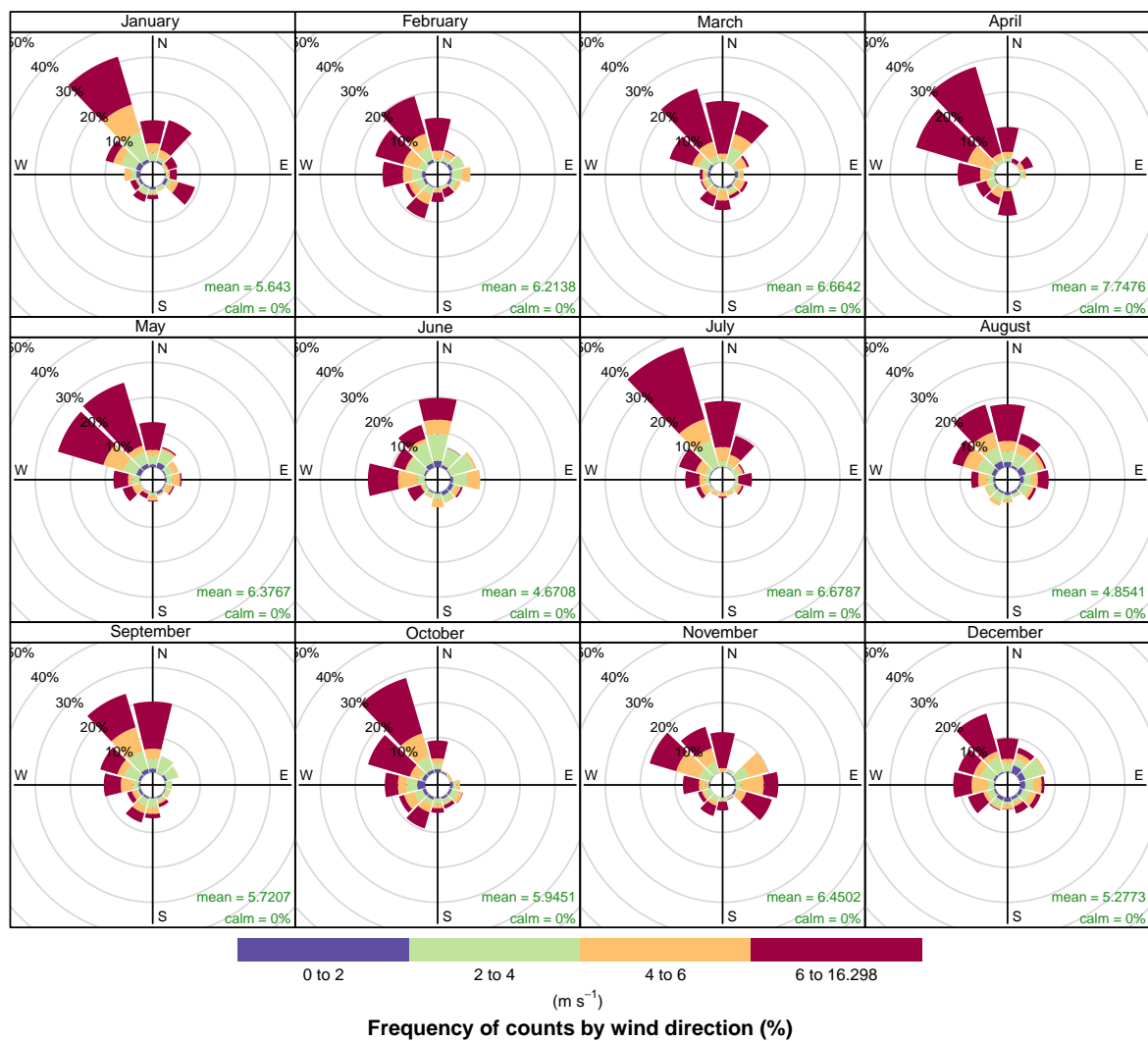
**Figure S10.** Wind rose TCCON Lauder location for 2015.



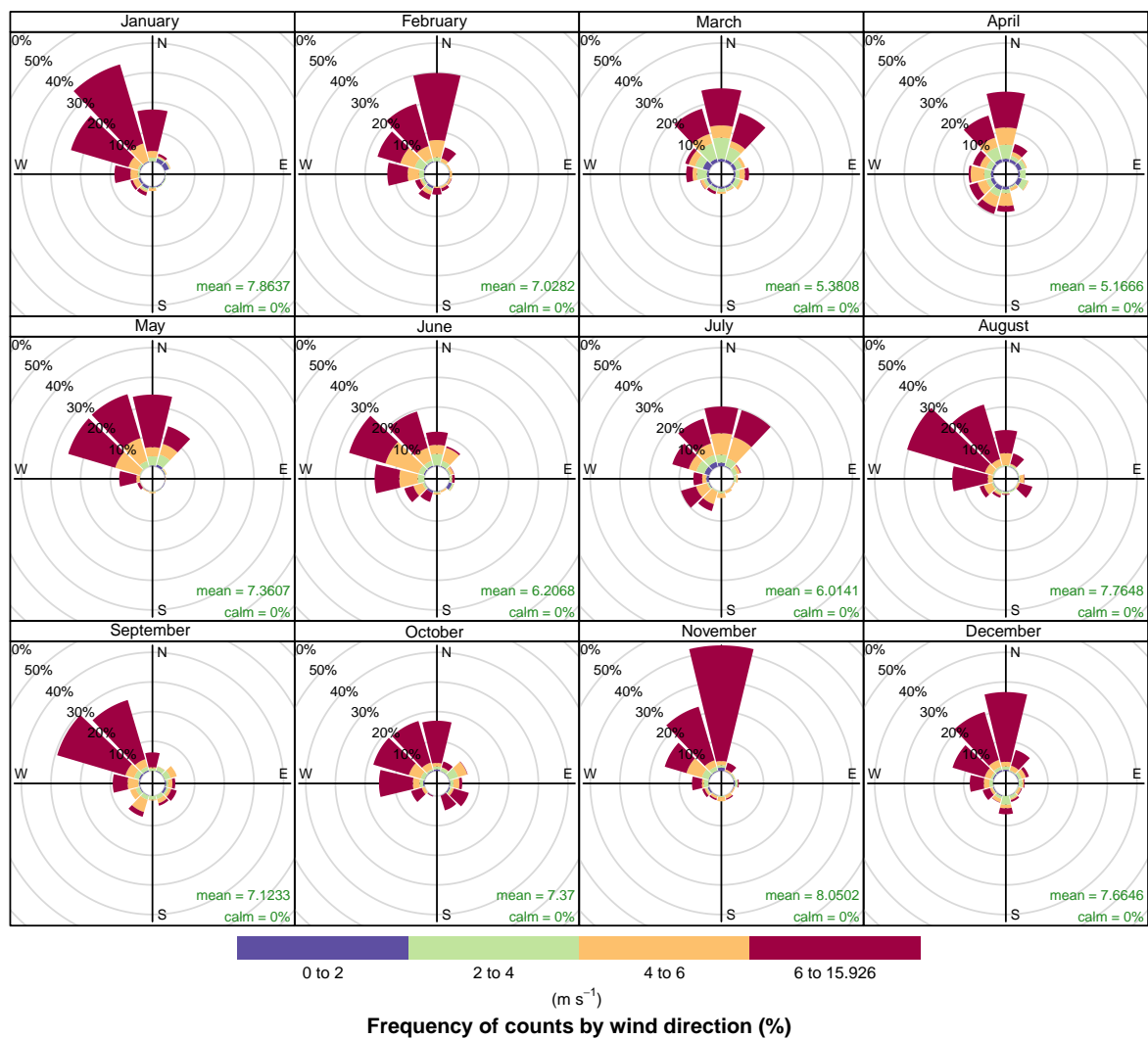
**Figure S11.** Wind rose TCCON Lauder location for 2016.



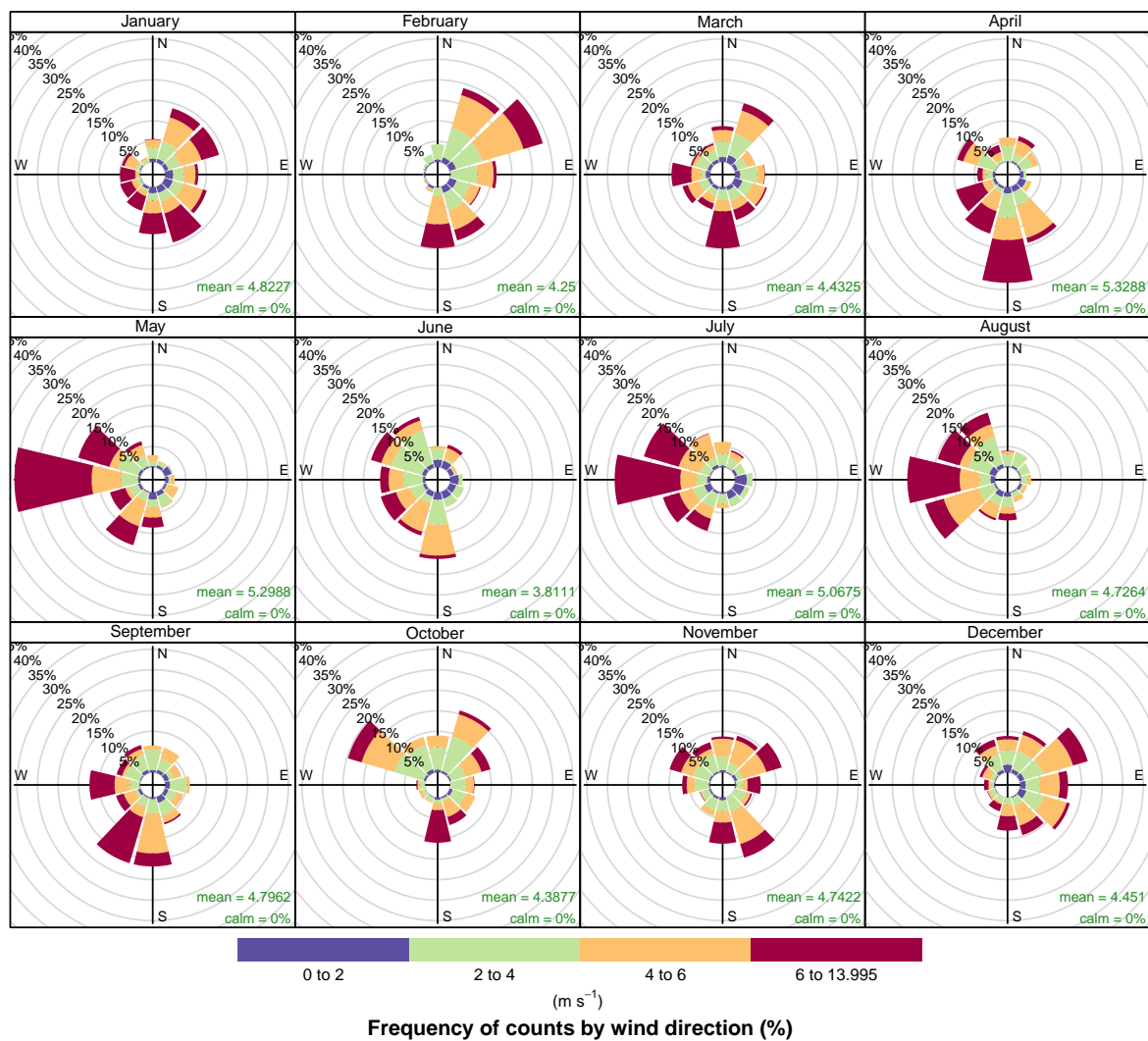
**Figure S12.** Wind rose TCCON Lauder Location for 2017.



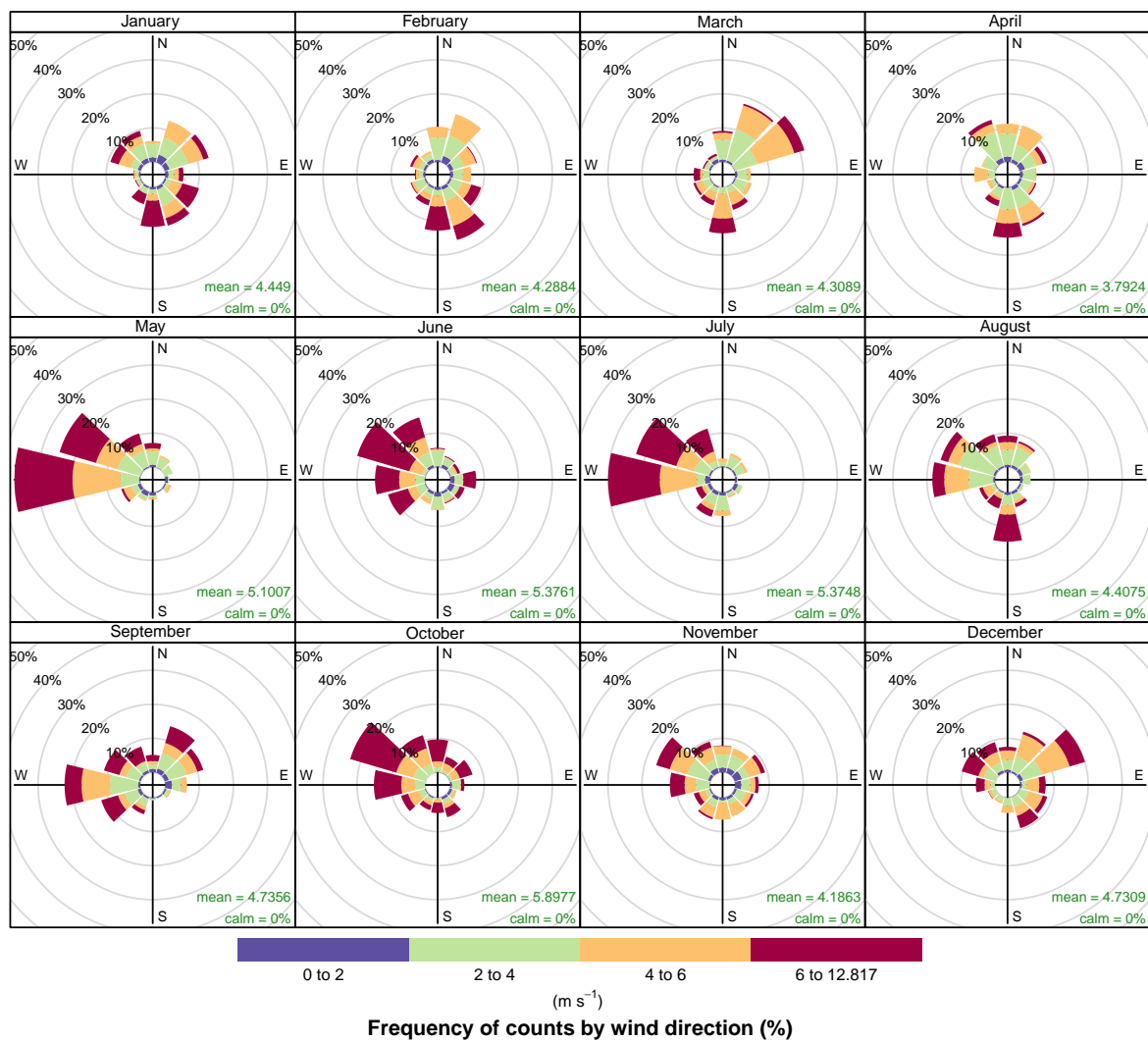
**Figure S13.** Wind rose TCCON Lauder Location for 2018.



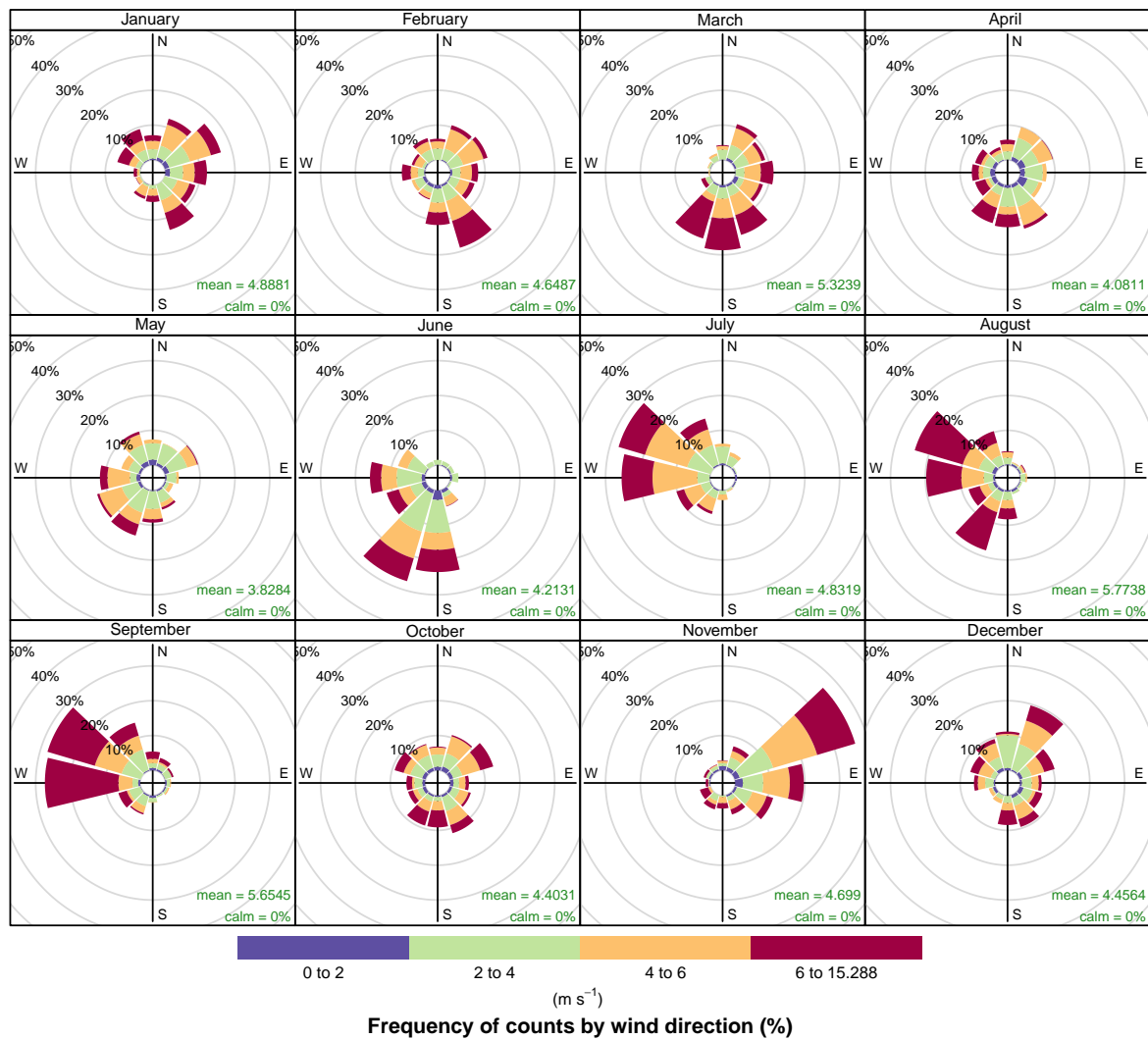
**Figure S14.** Wind rose TCCON Lauder Location for 2019.



**Figure S15.** Wind rose TCCON Wollongong location for 2015.

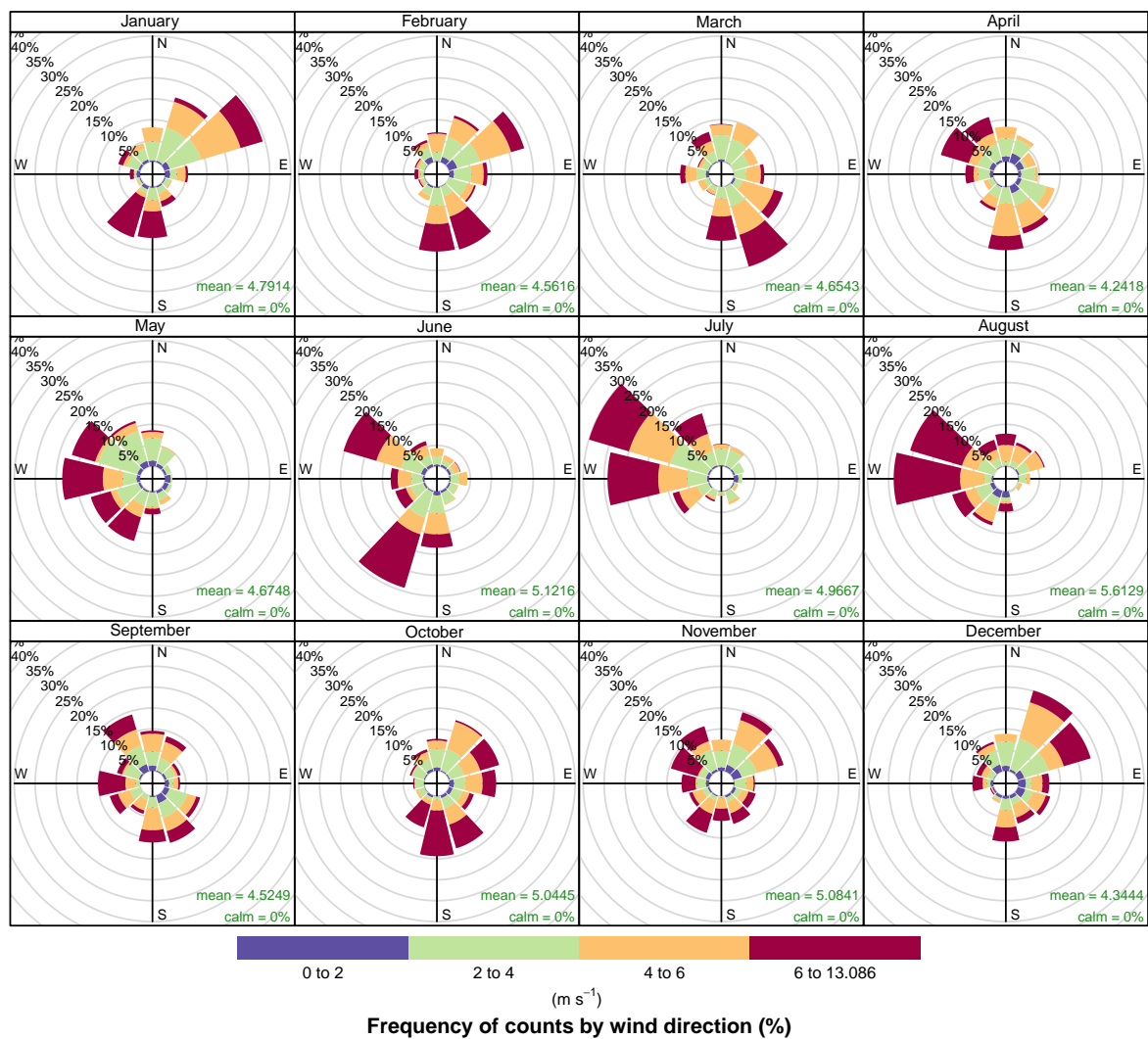


**Figure S16.** Wind rose TCCON Wollongong location for 2016.

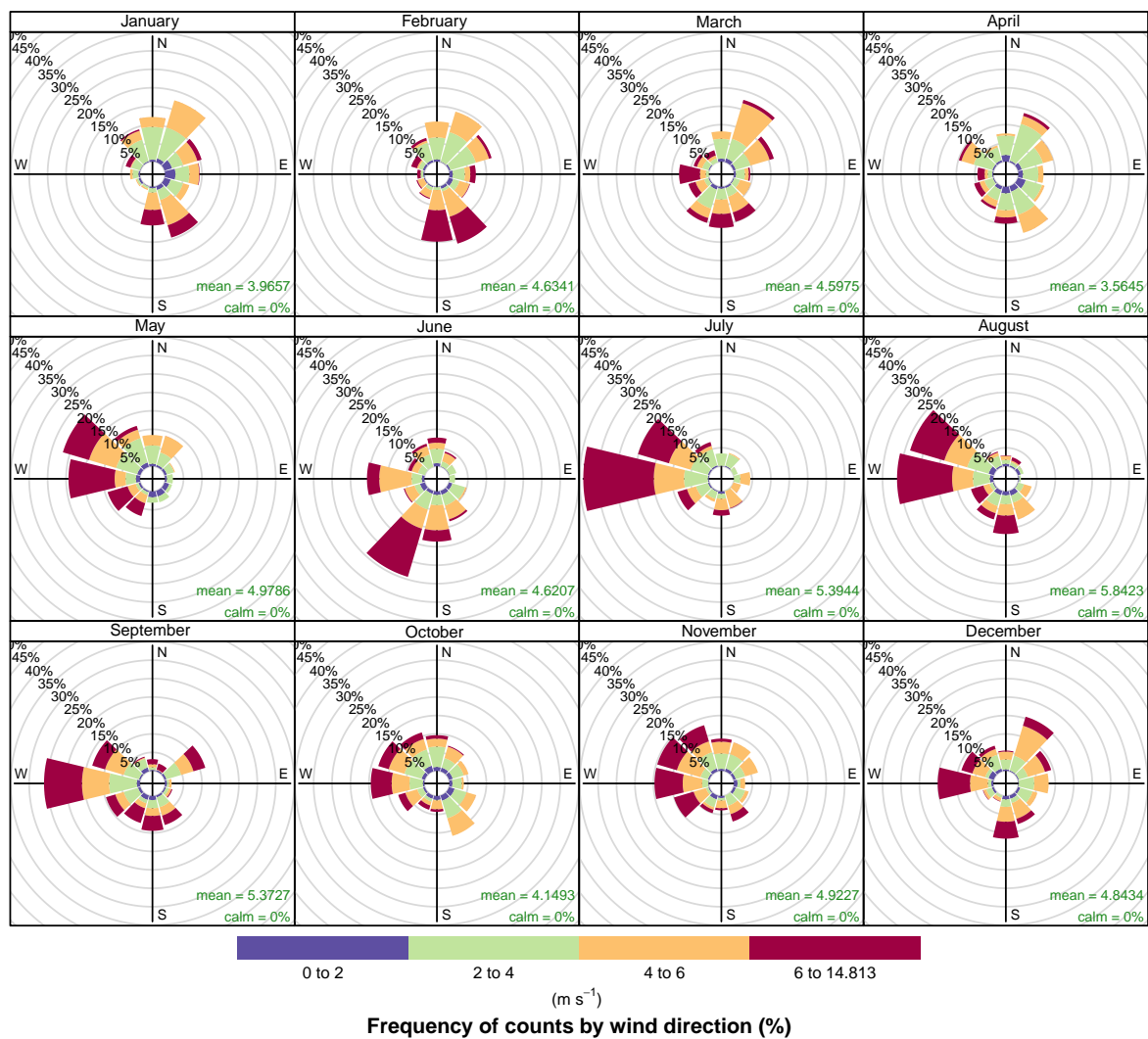


**Figure S17.** Wind rose TCCON Wollongong Location for 2017.





**Figure S18.** Wind rose TCCON Wollongong Location for 2018.



**Figure S19.** Wind rose TCCON Wollongong Location for 2019.

2.2 Wind directions at in-situ sites

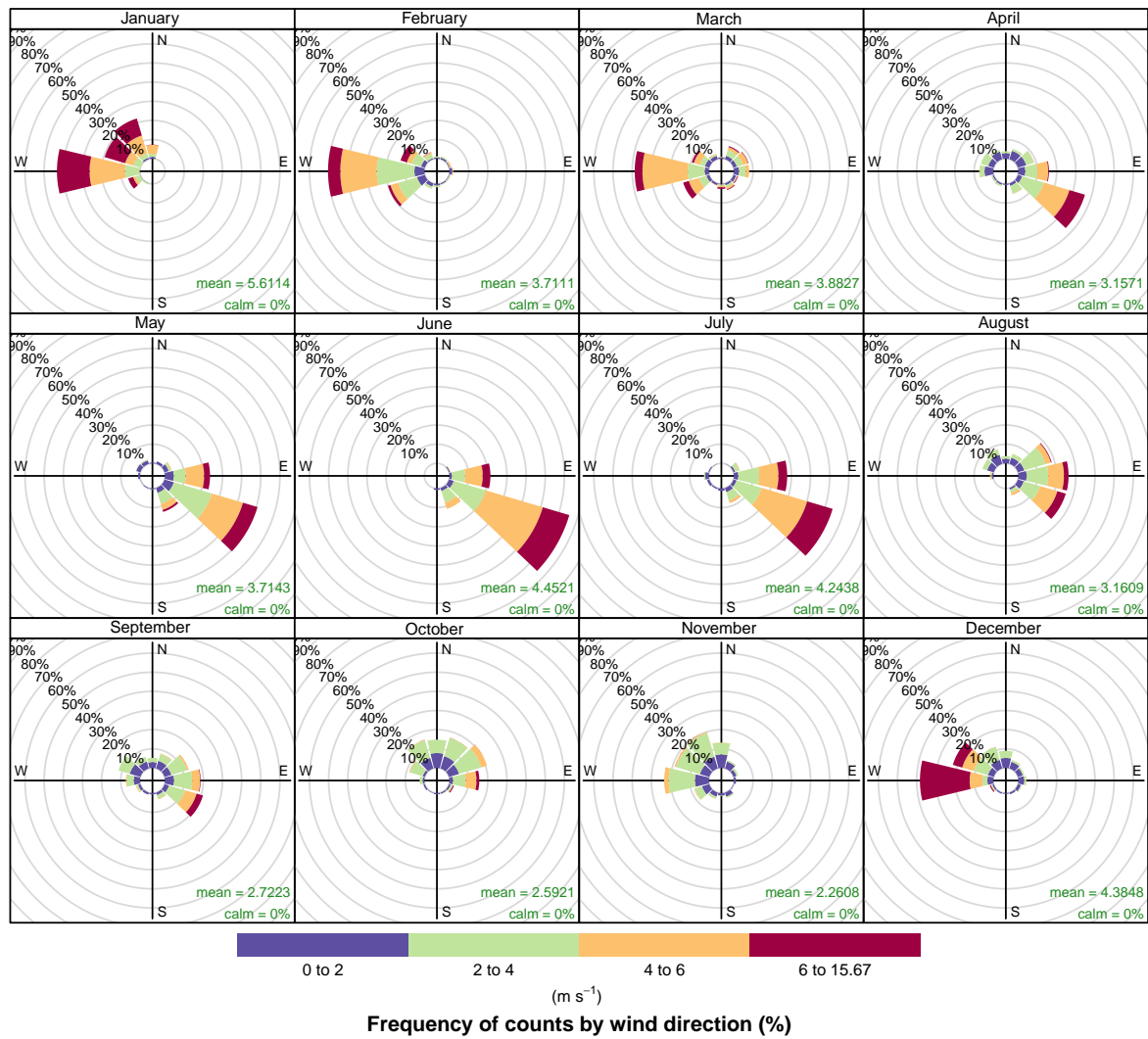
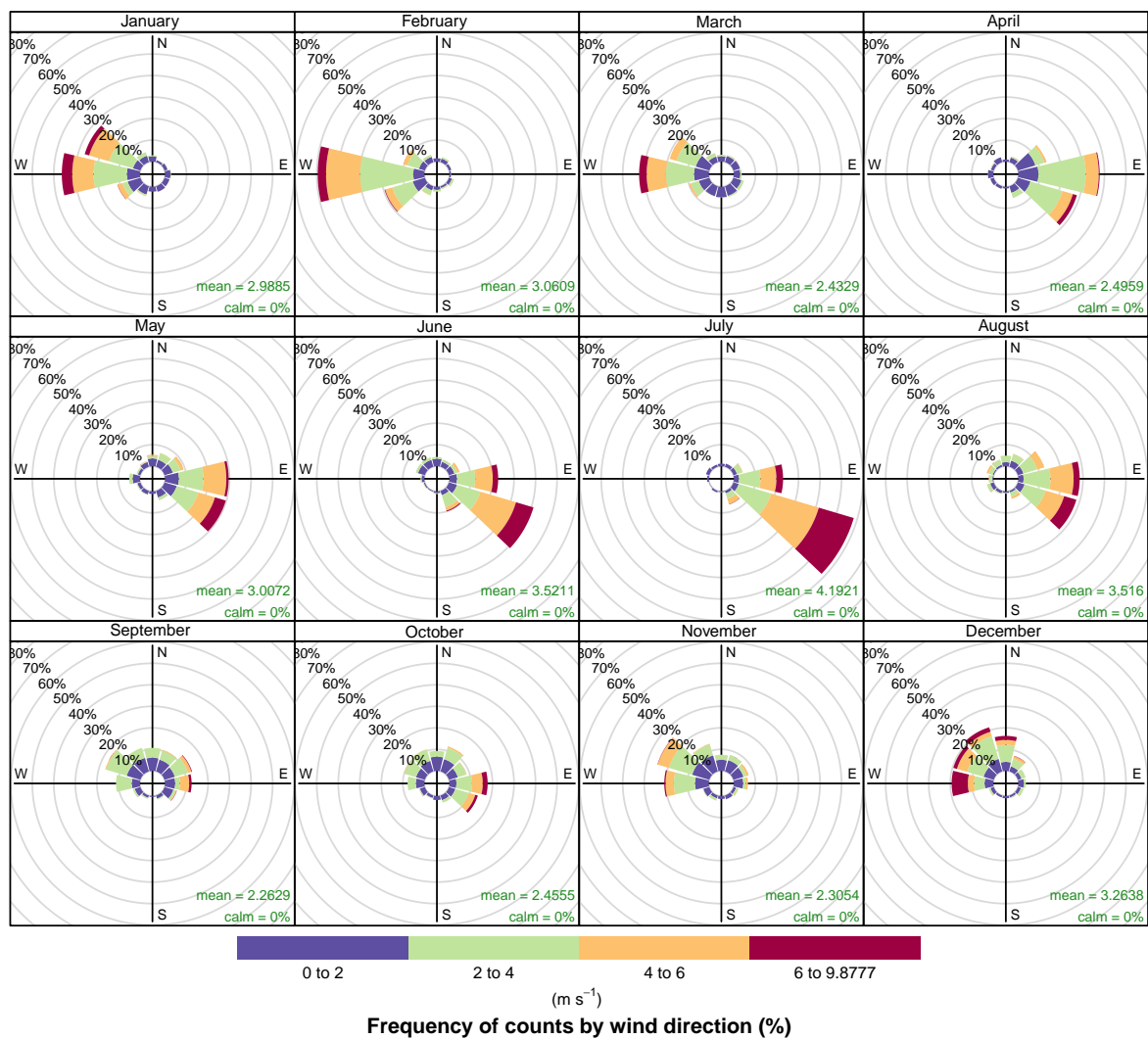
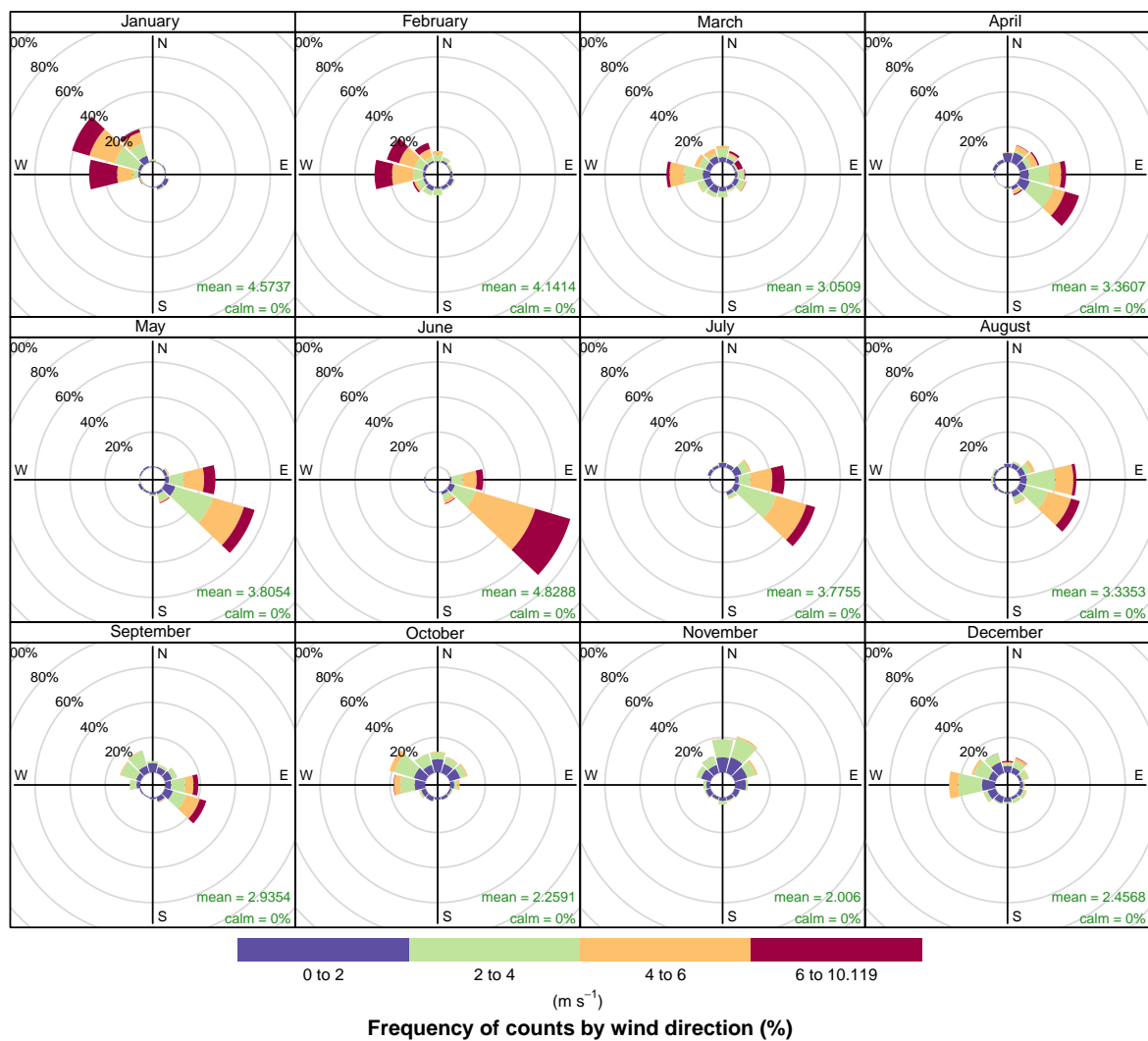


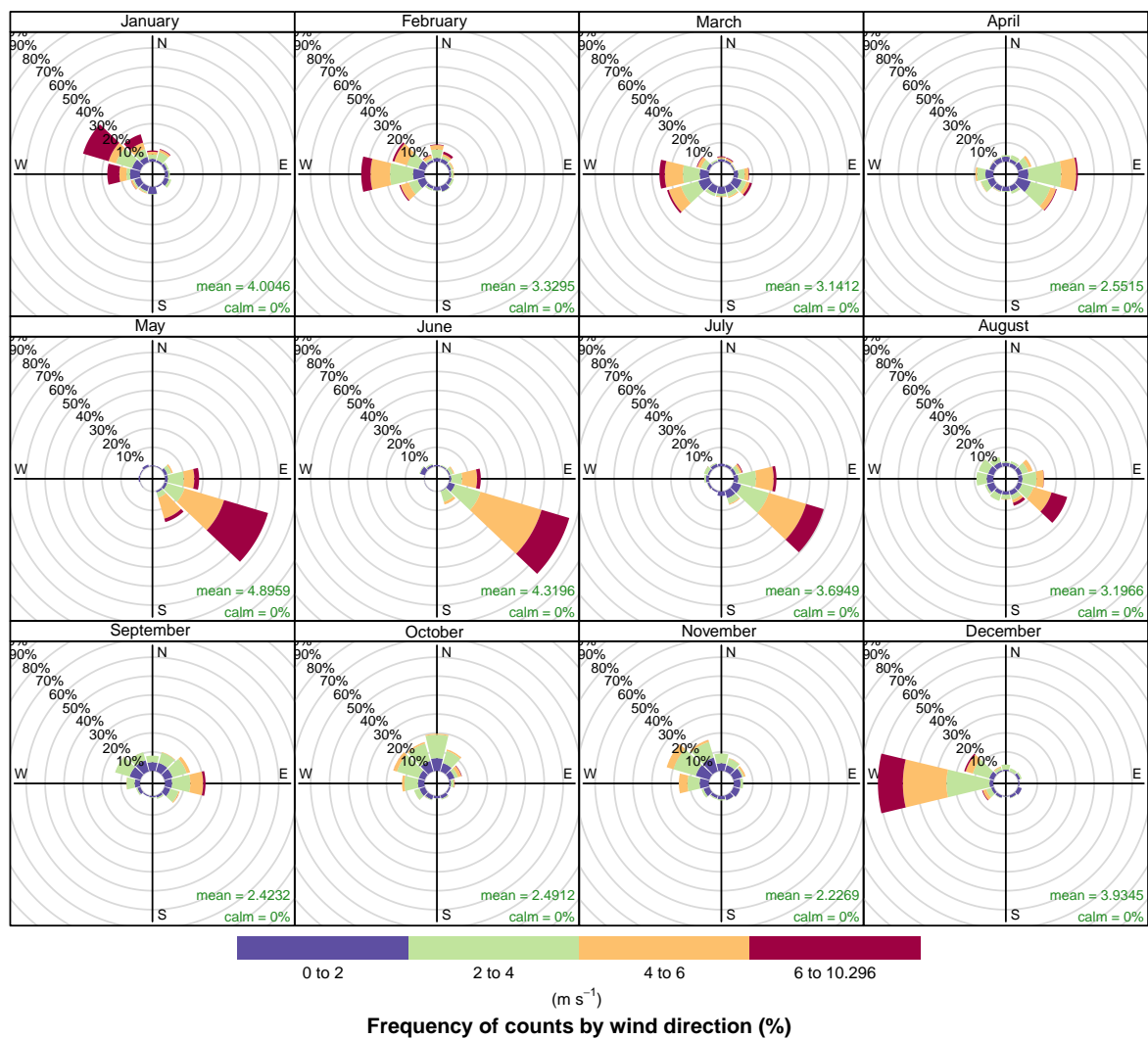
Figure S20. Wind rose Gunn Point location for 2015.



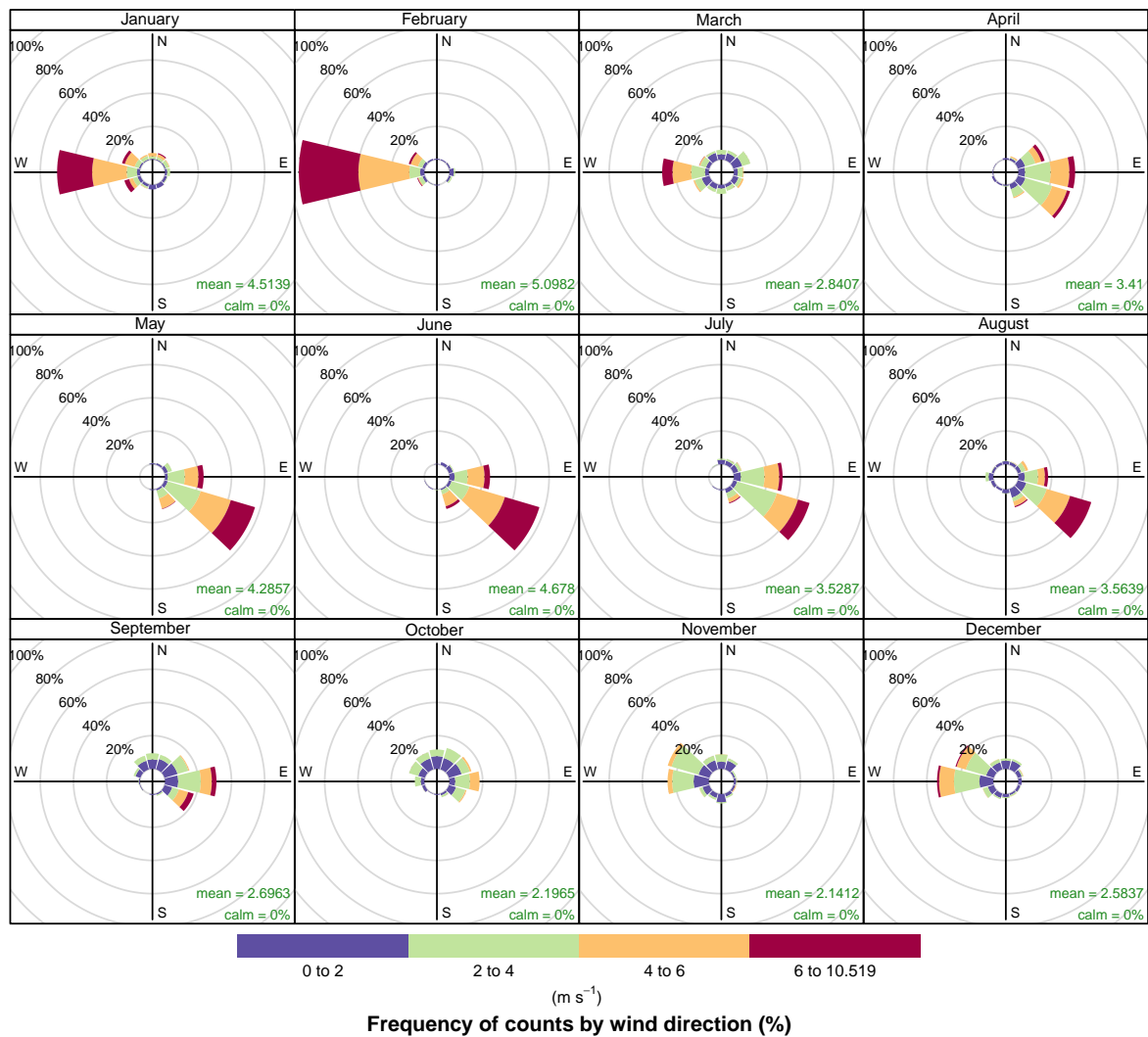
**Figure S21.** Wind rose Gunn Point location for 2016.



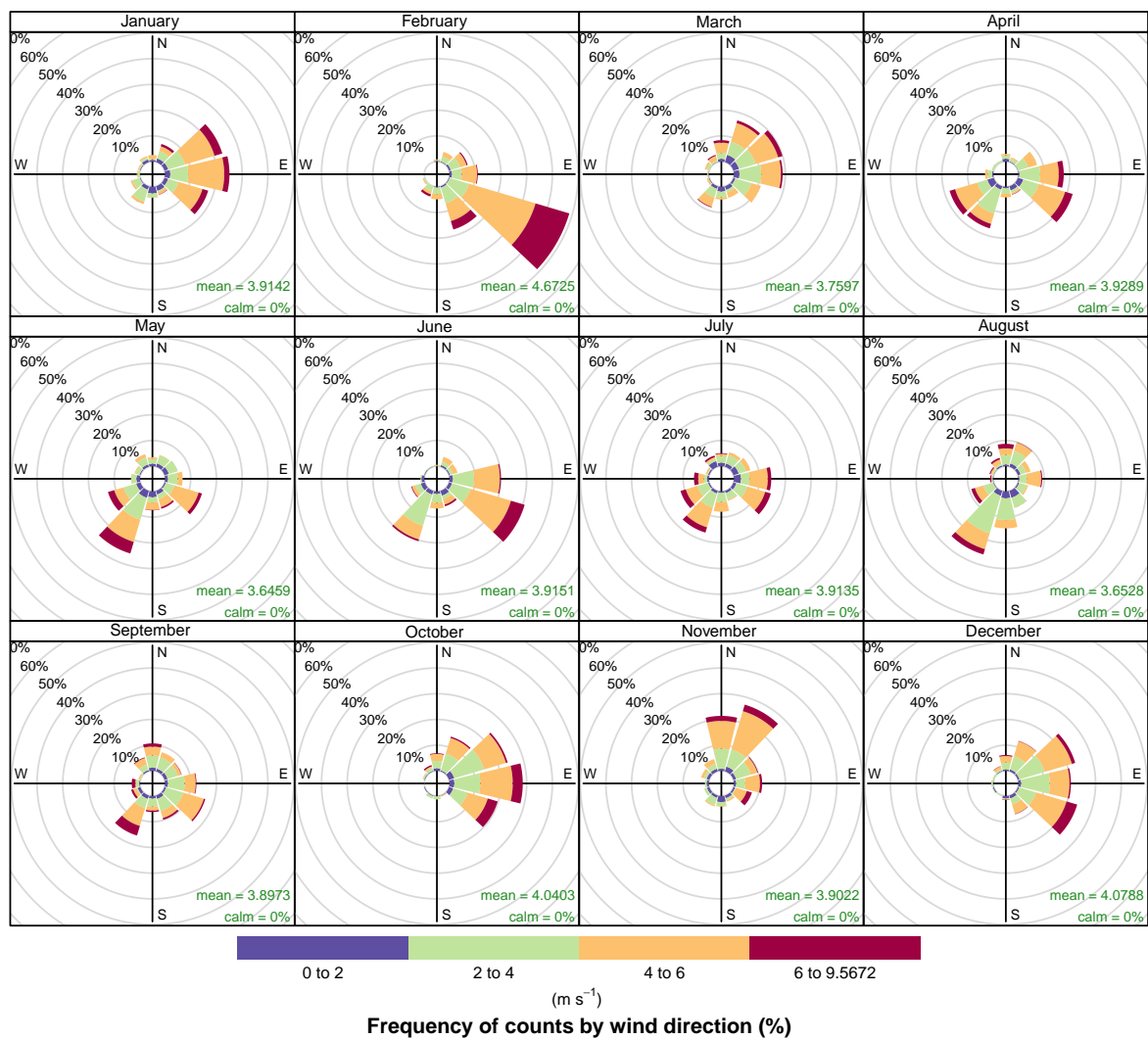
**Figure S22.** Wind rose Gunn Point Location for 2017.



**Figure S23.** Wind rose Gunn Point Location for 2018.

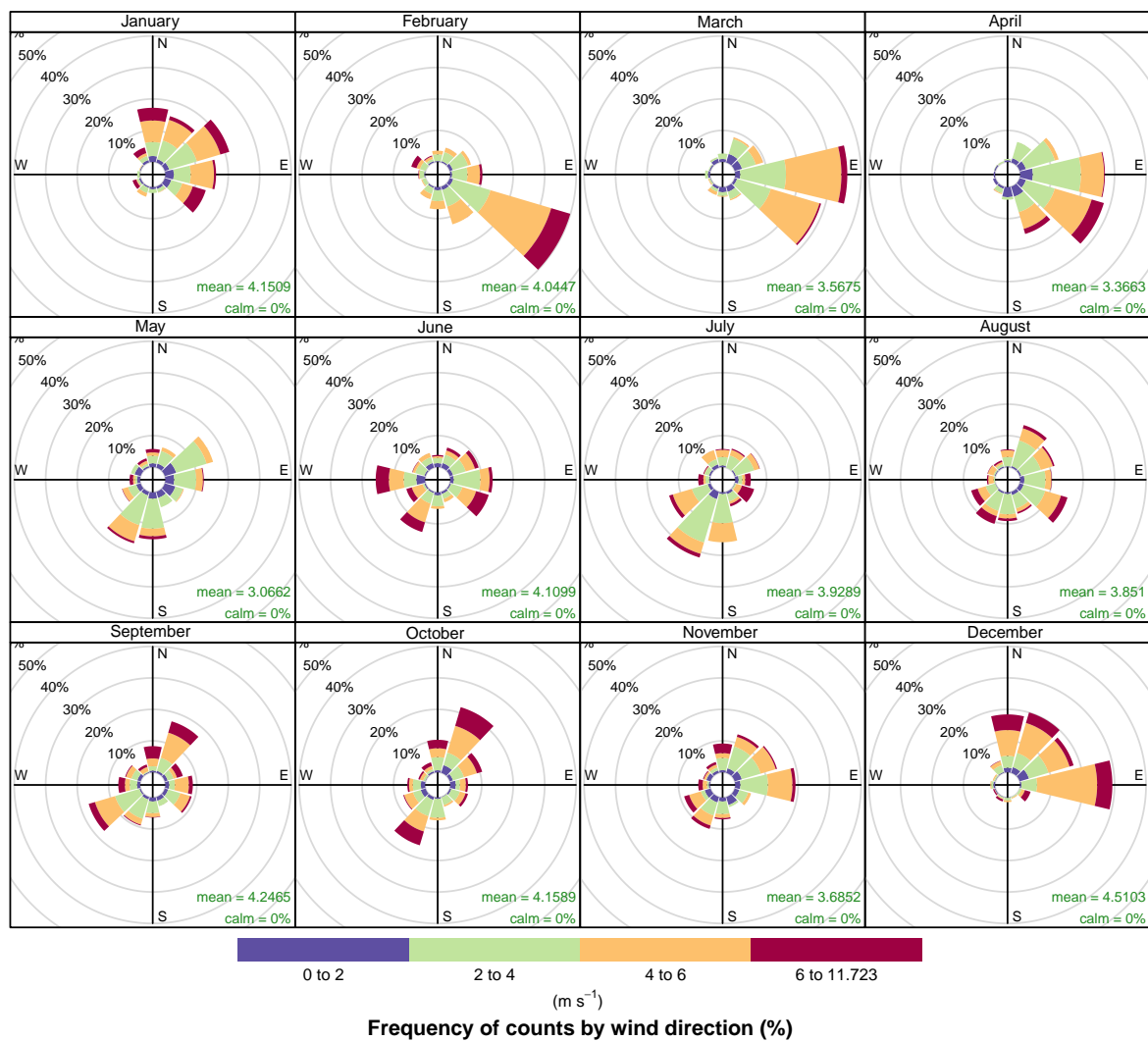


**Figure S24.** Wind rose Gunn Point Location for 2019.

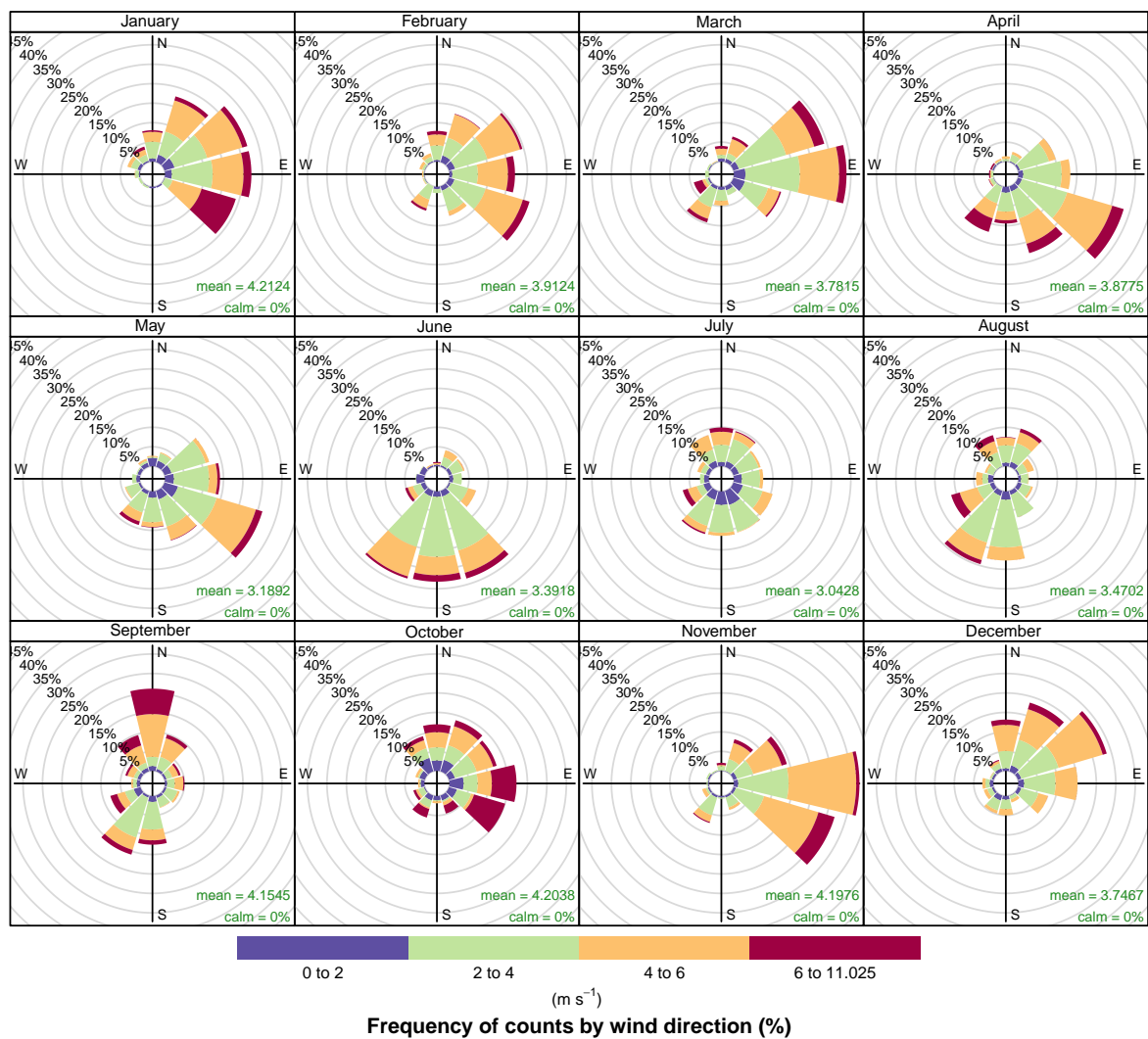


**Figure S25.** Wind rose Burncluith location for 2015.

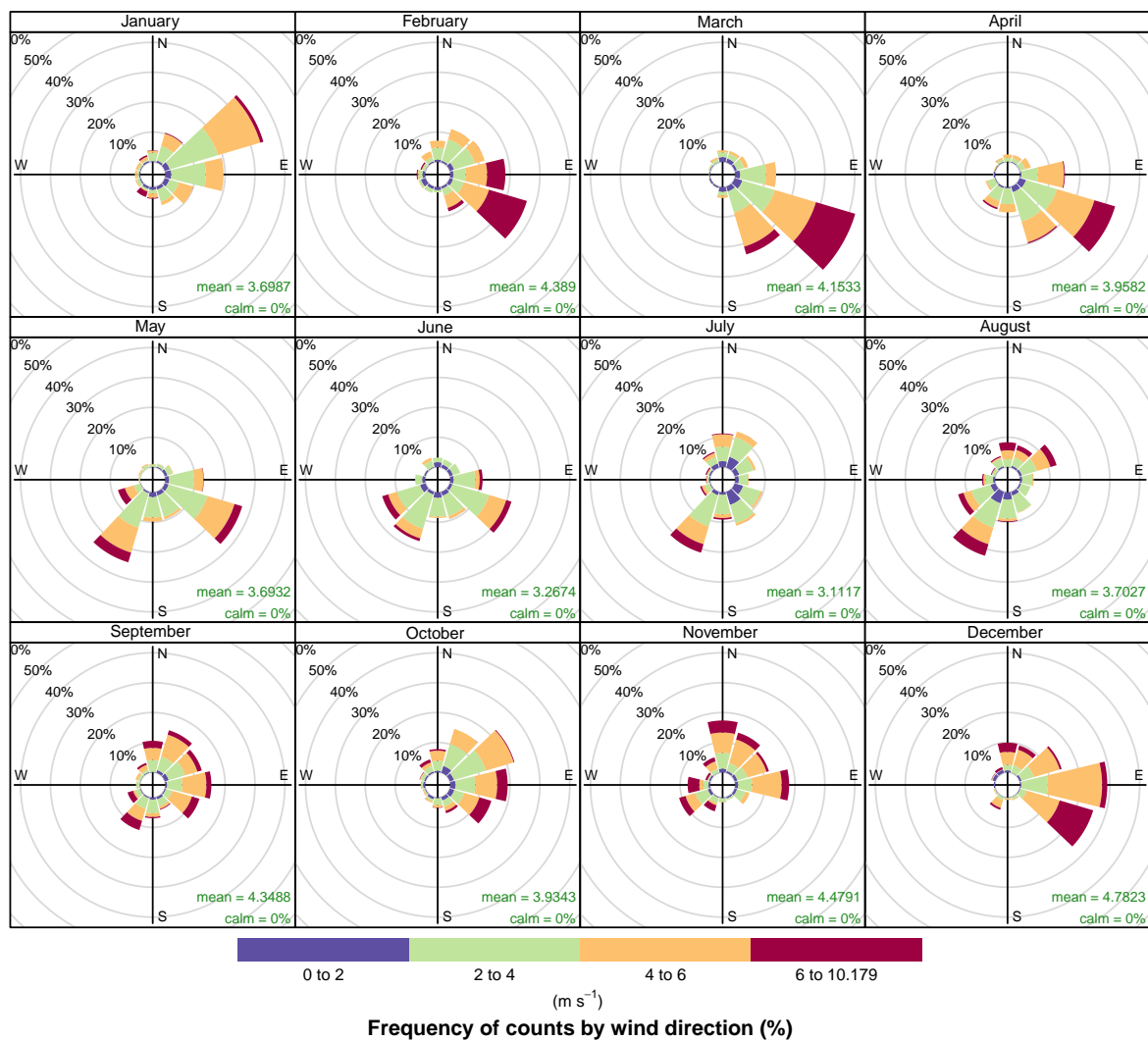




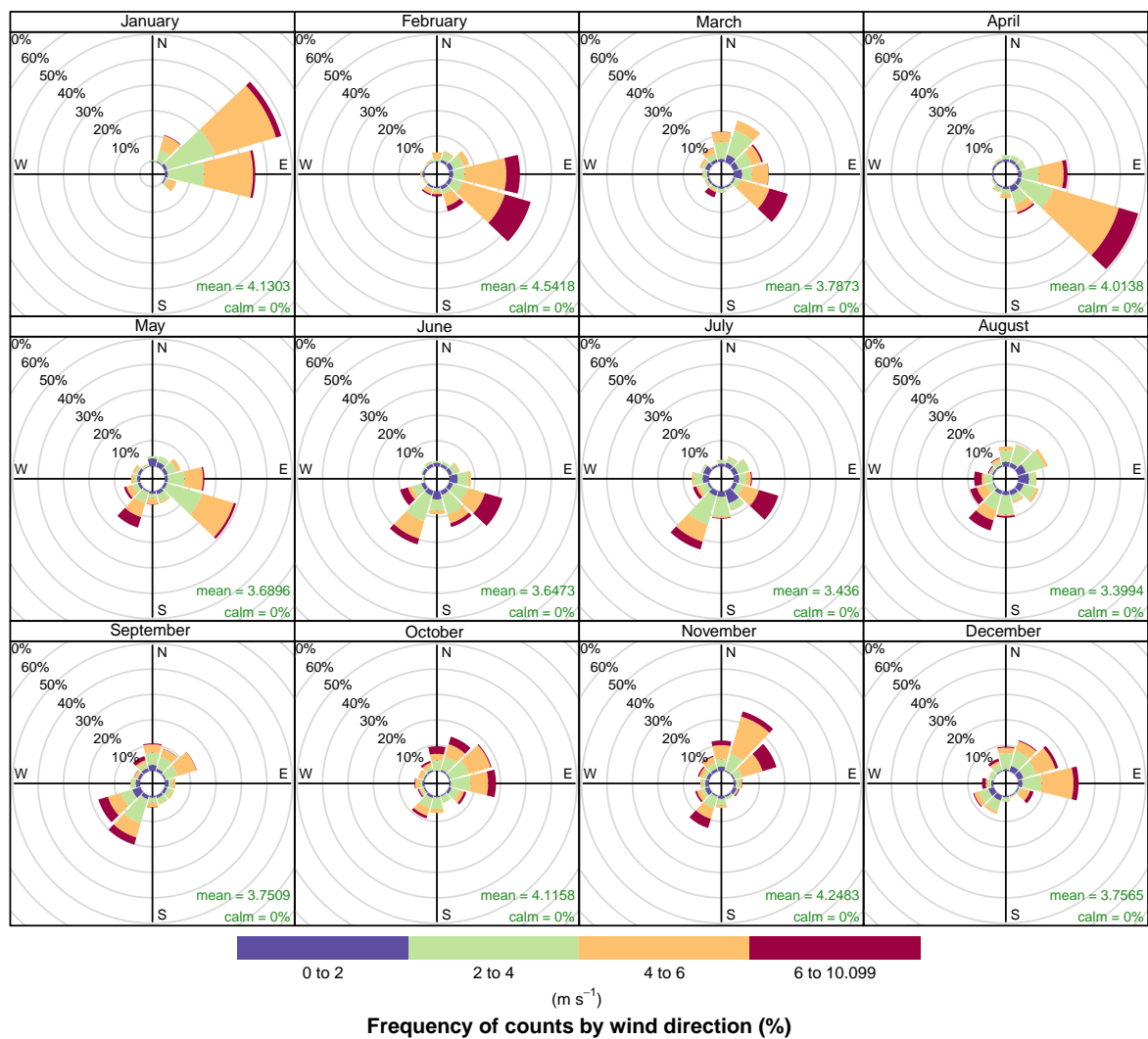
**Figure S26.** Wind rose Burncluith location for 2016.



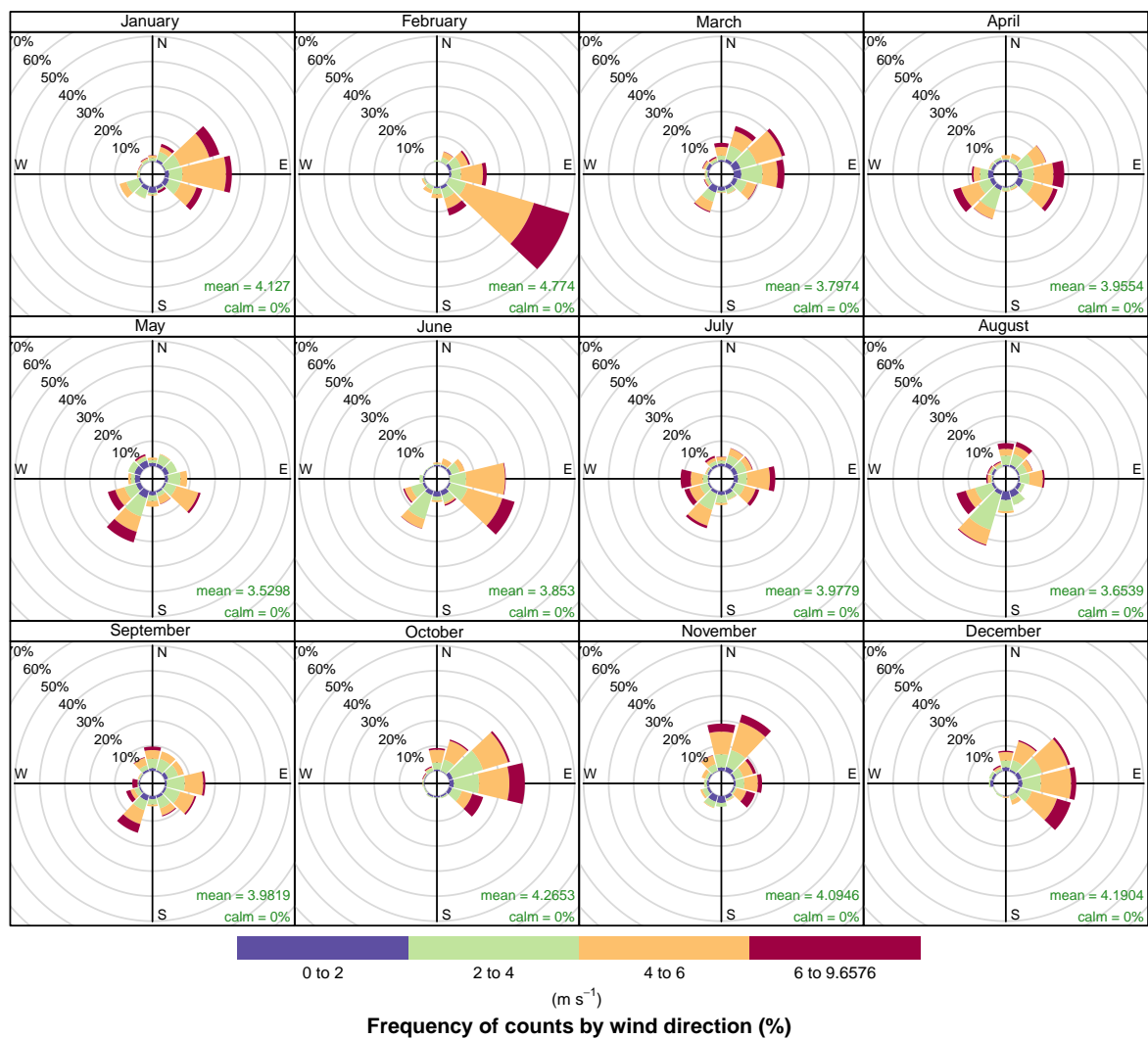
**Figure S27.** Wind rose Burncluith location for 2017.



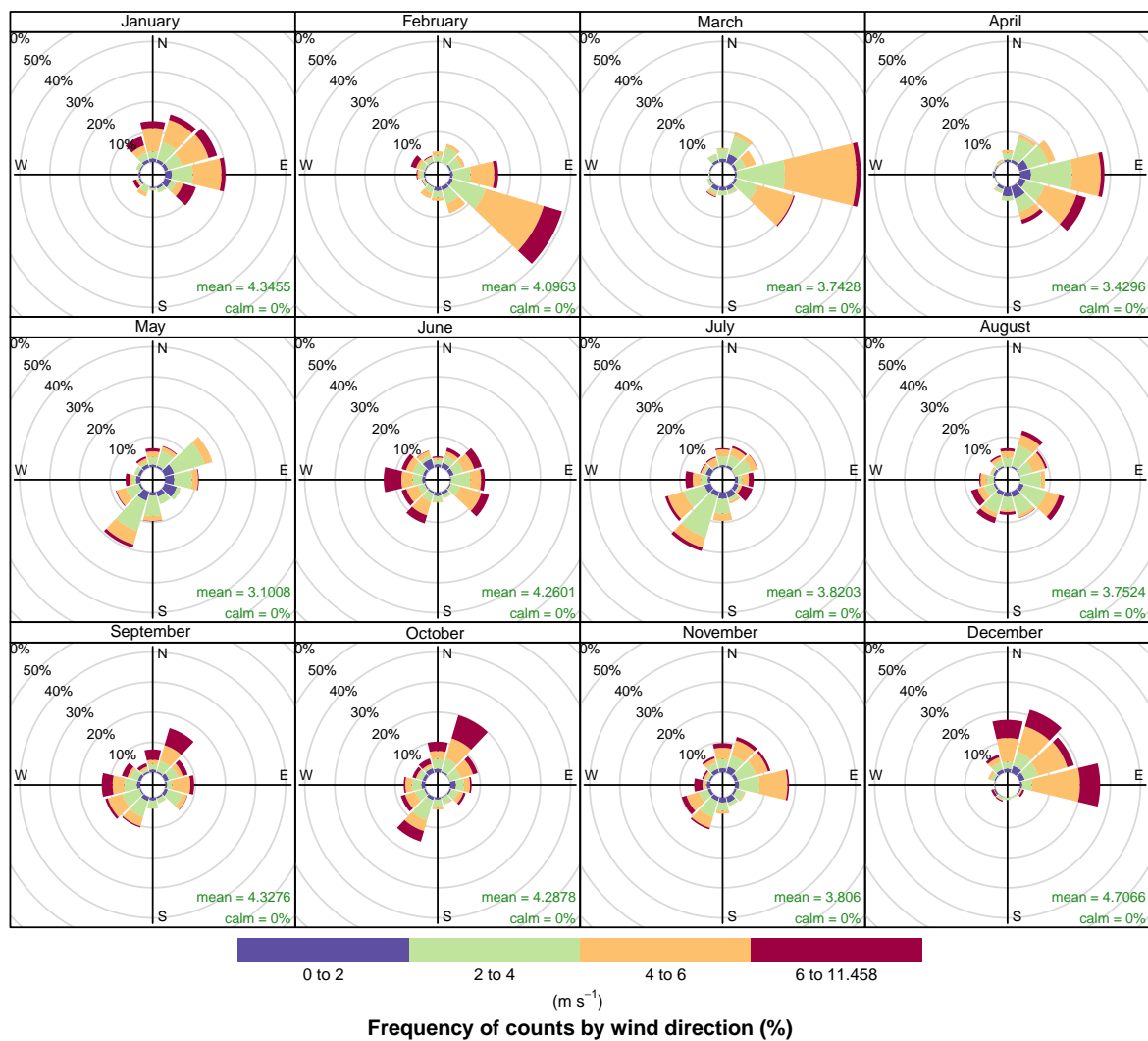
**Figure S28.** Wind rose Burncluith location for 2018.



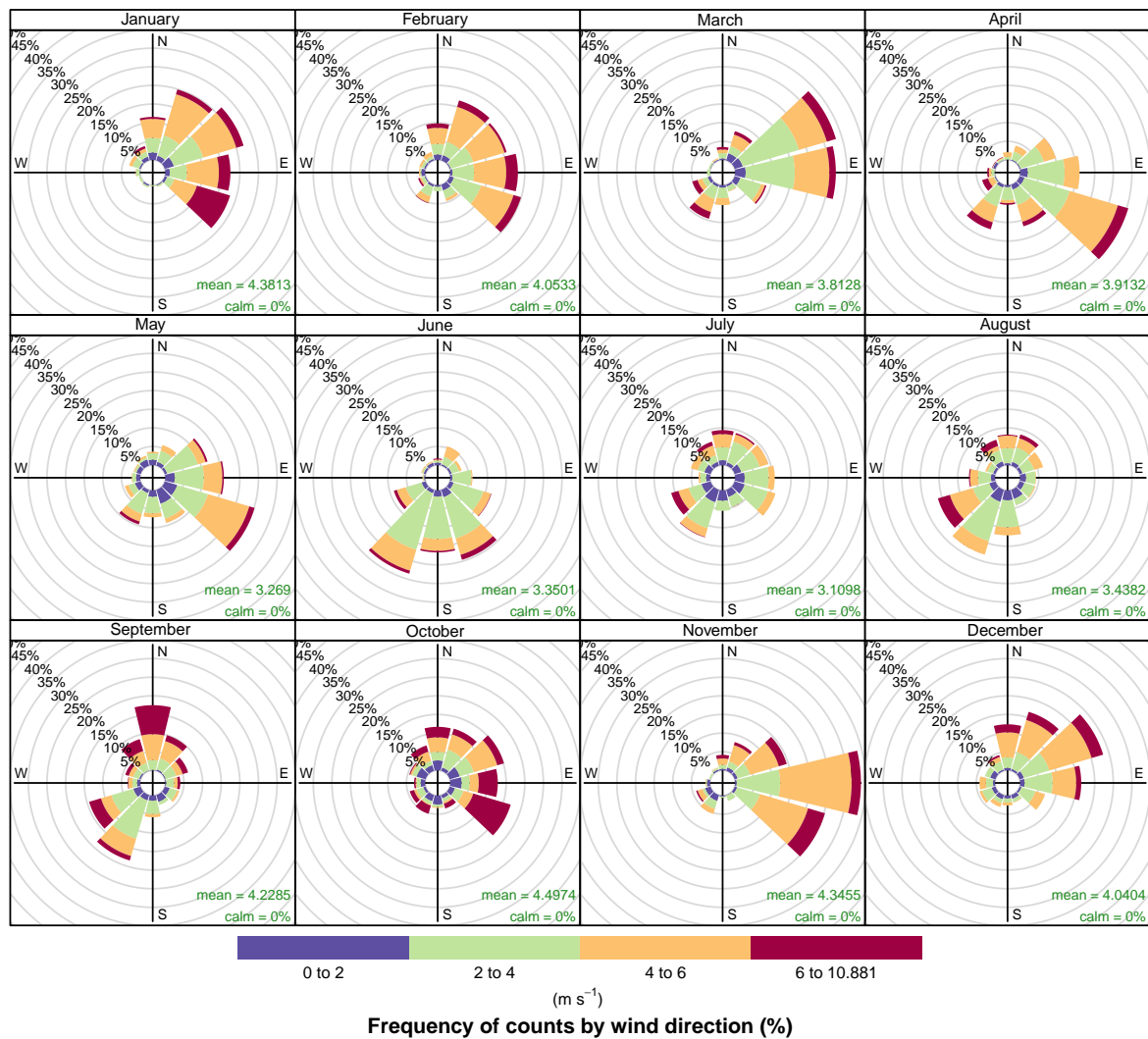
**Figure S29.** Wind rose Ironbark location for 2019.



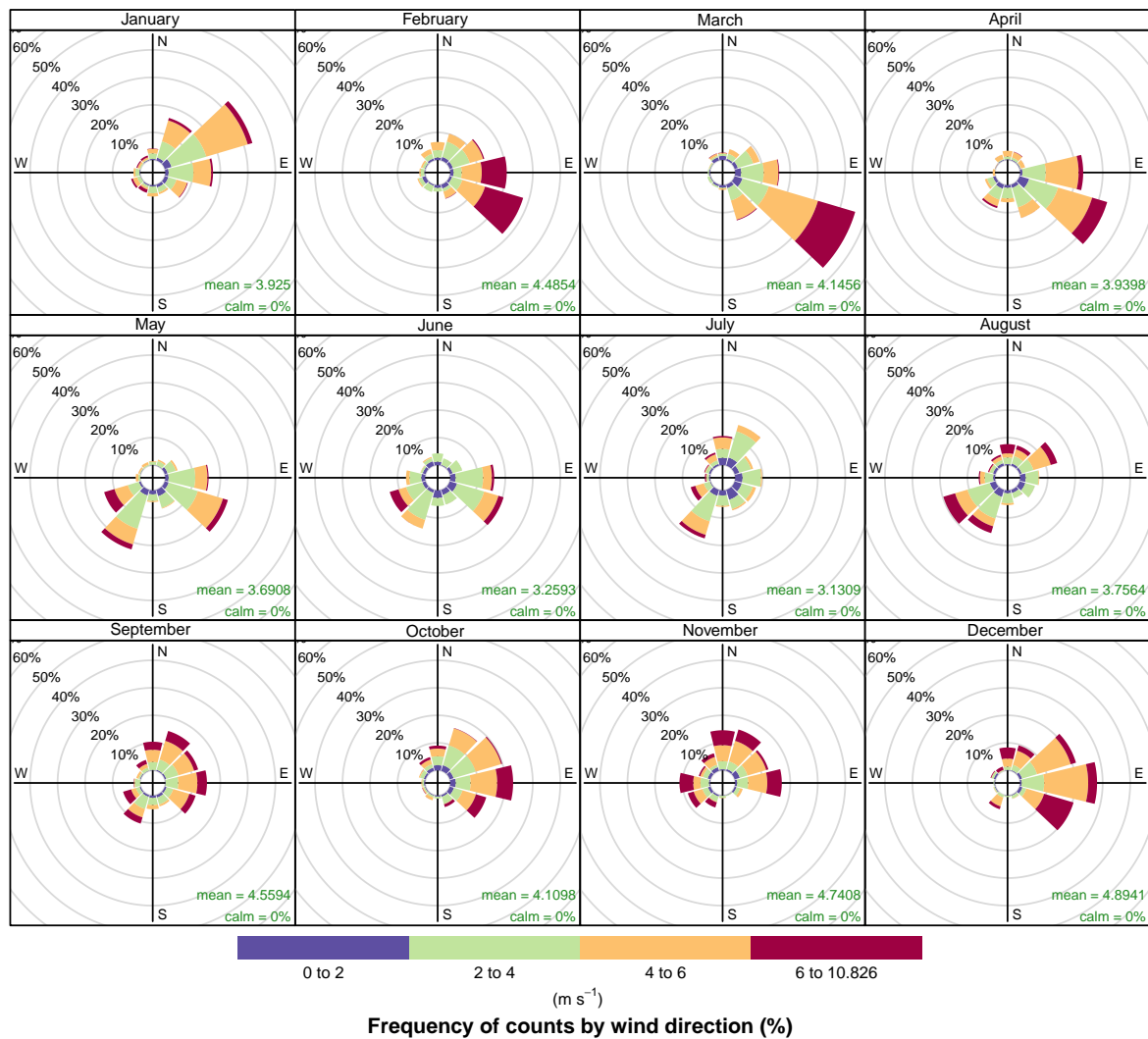
**Figure S30.** Wind rose Ironbark location for 2015.



**Figure S31.** Wind rose Ironbark location for 2016.

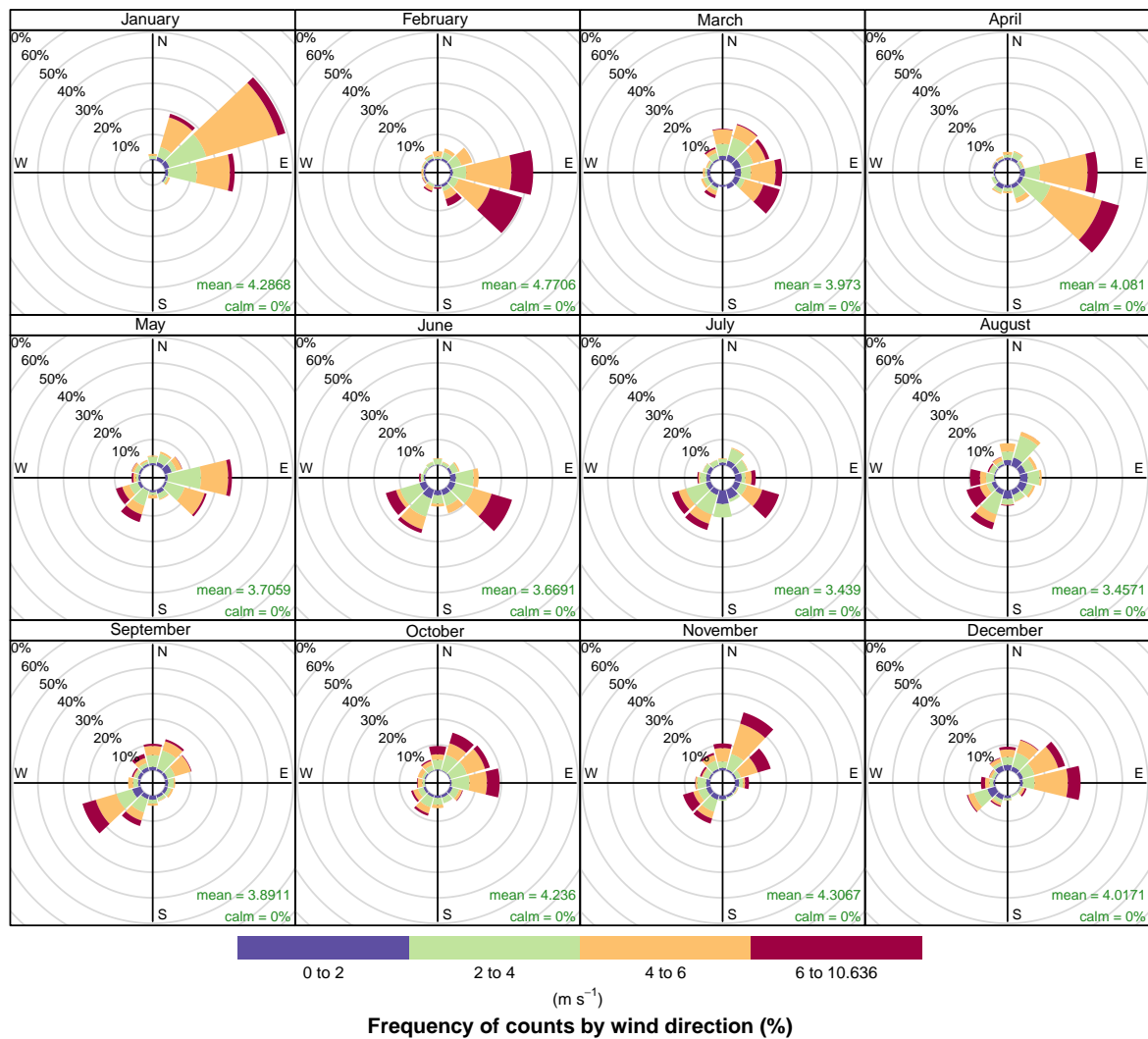


**Figure S32.** Wind rose Ironbark location for 2017.

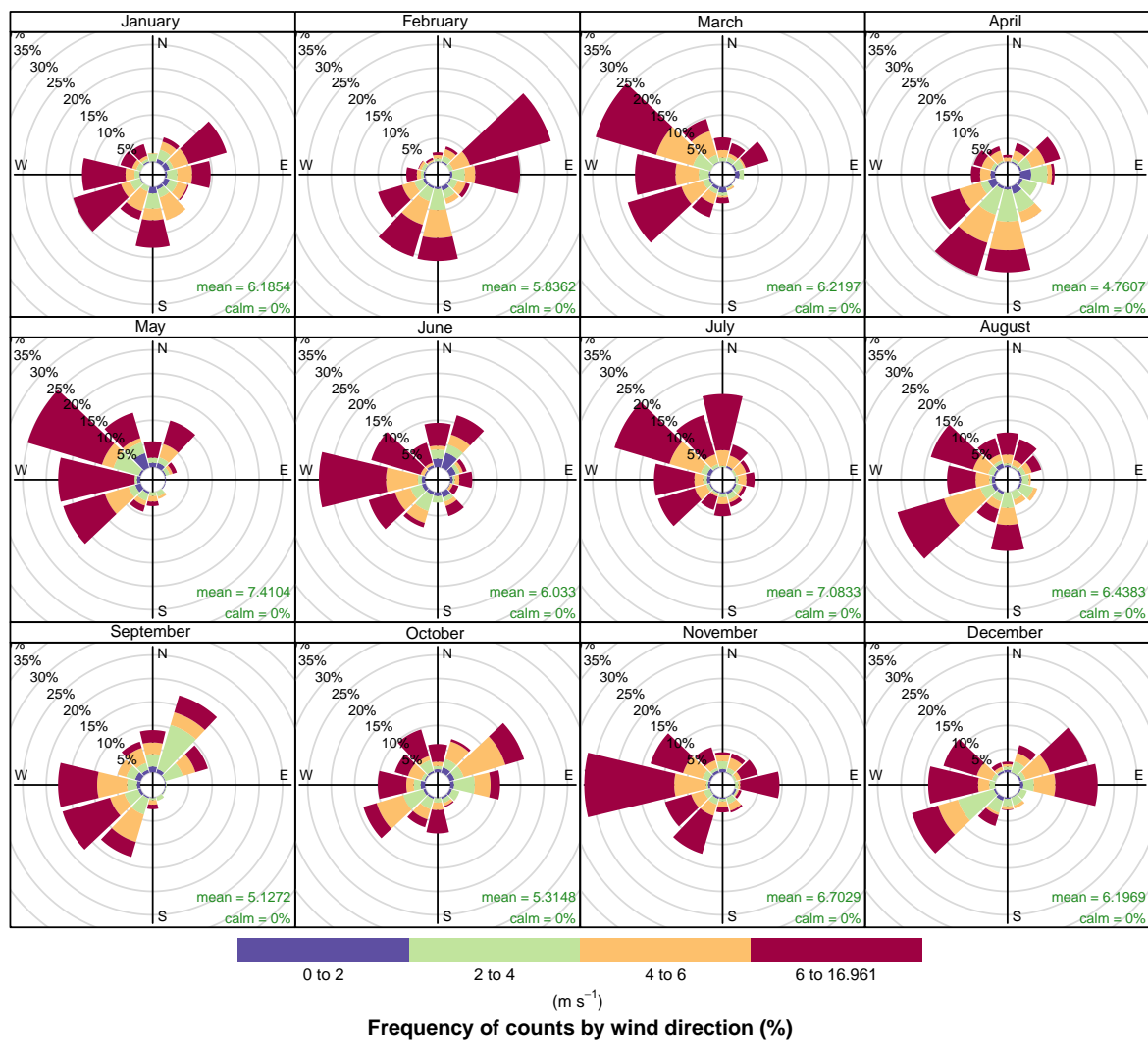


**Figure S33.** Wind rose Ironbark location for 2018.

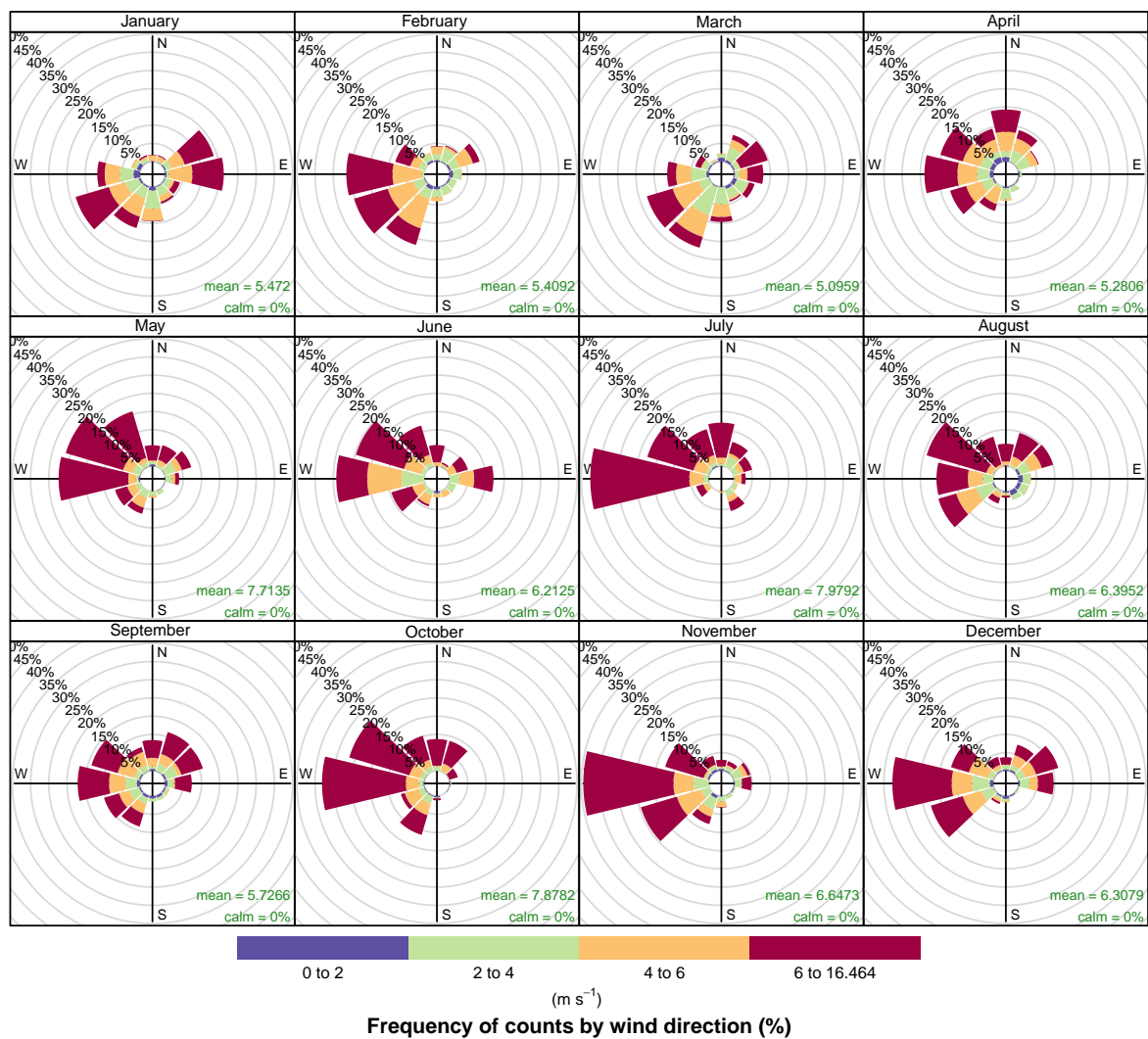




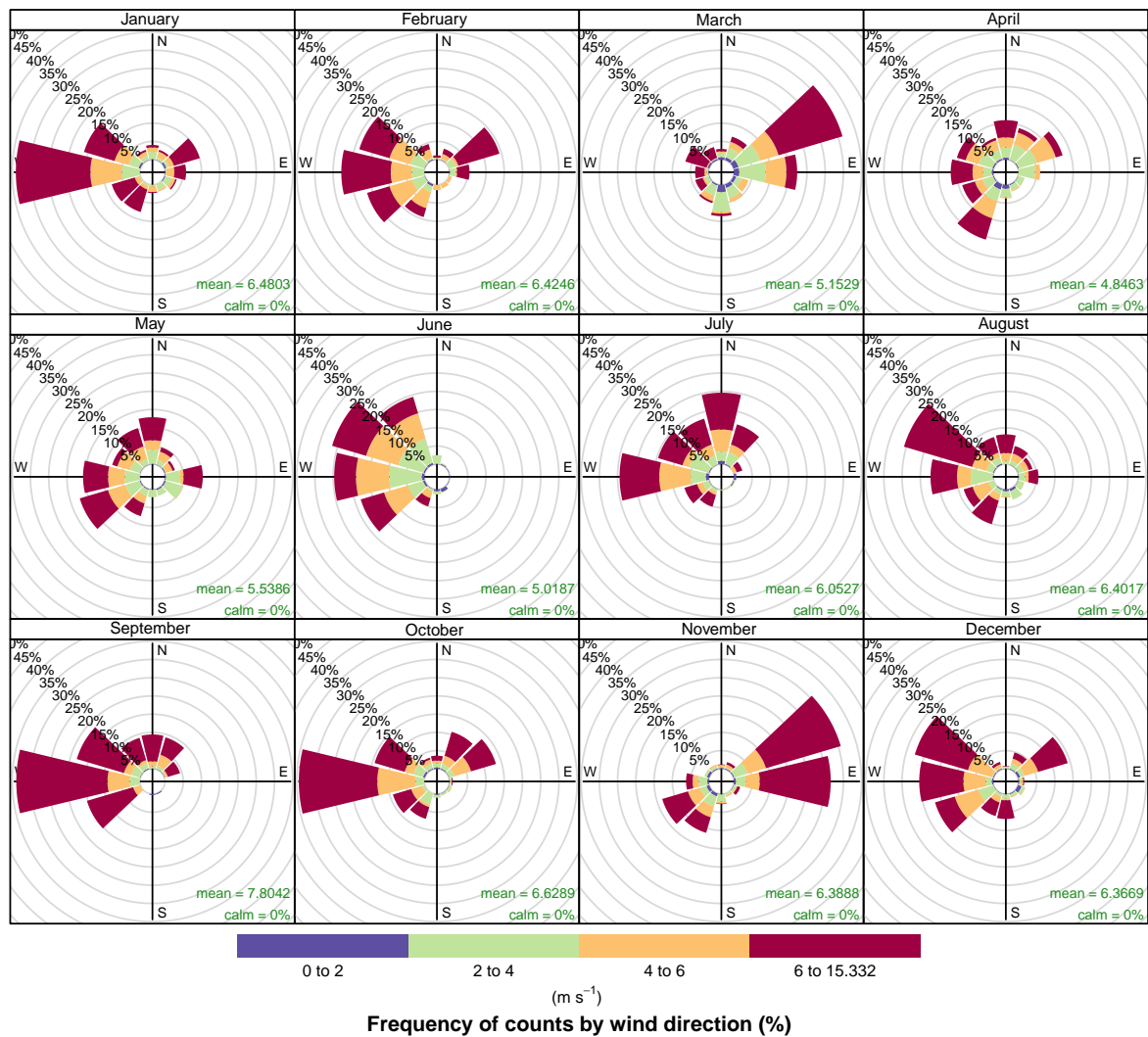
**Figure S34.** Wind rose Ironbark location for 2019.



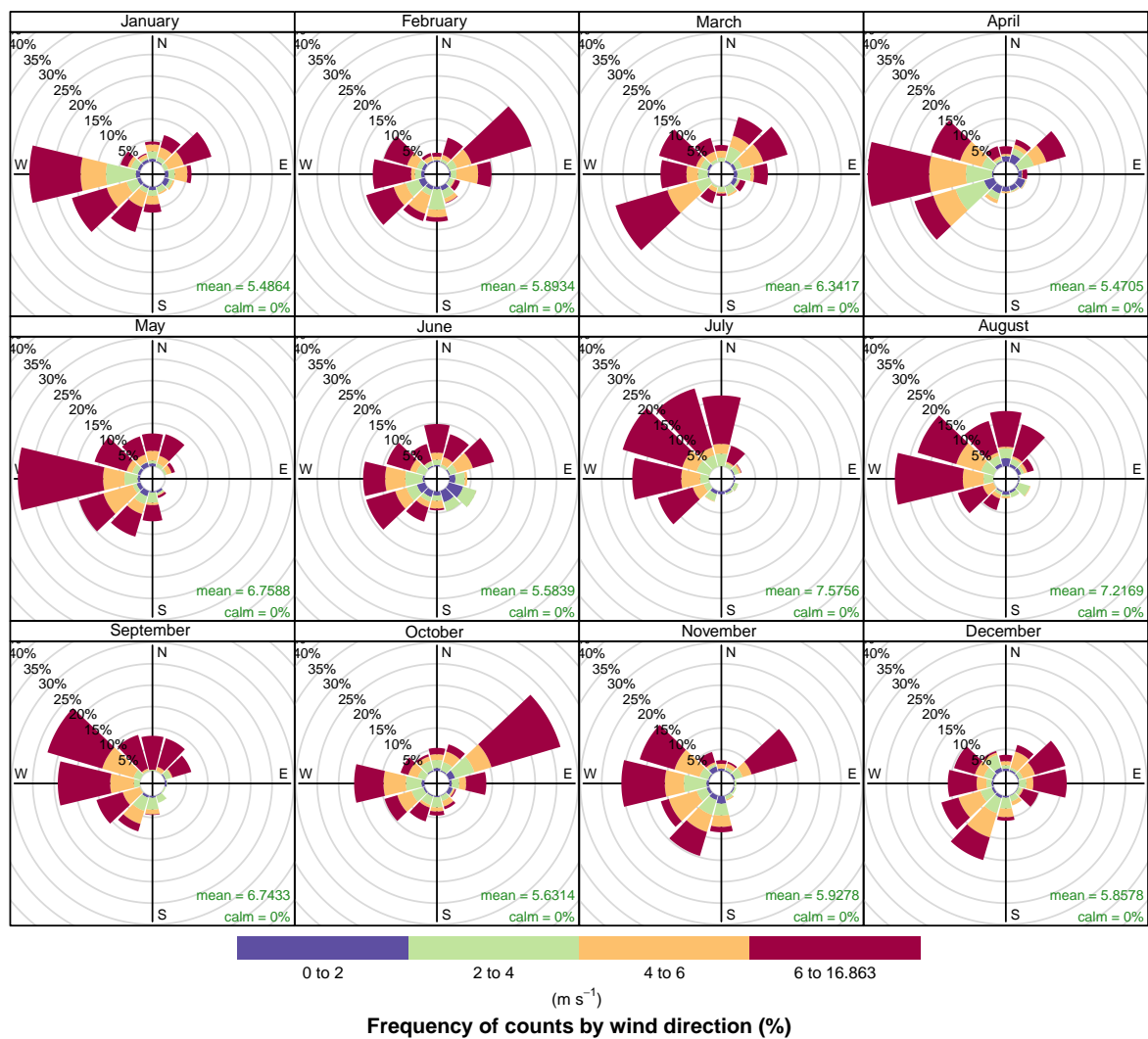
**Figure S35.** Wind rose Cape Grim location for 2015.



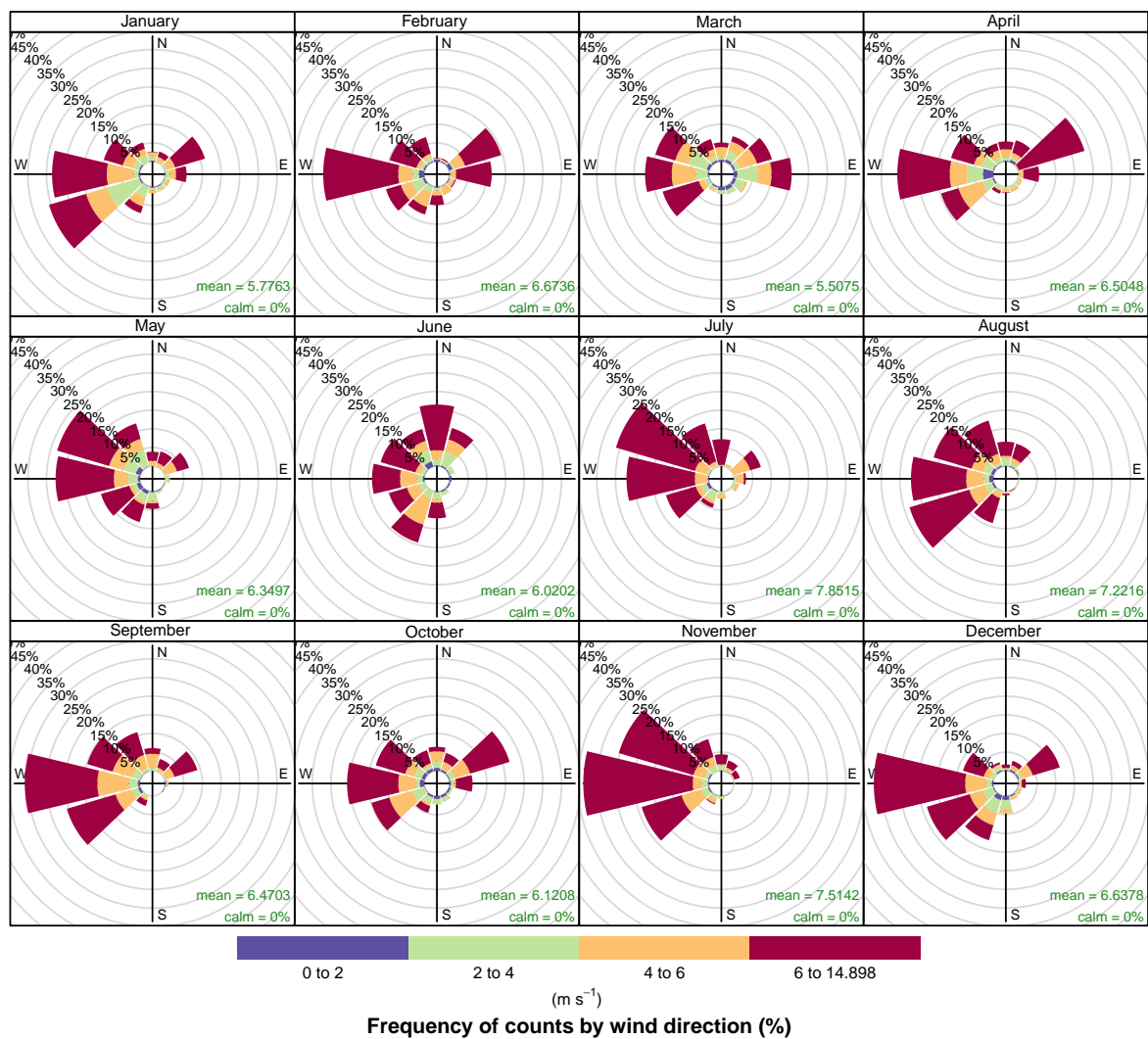
**Figure S36.** Wind rose Cape Grim location for 2016.



**Figure S37.** Wind rose Cape Grim location for 2017.



**Figure S38.** Wind rose Cape Grim location for 2018.



**Figure S39.** Wind rose Cape Grim location for 2019.