

# Supporting Information for “Observed Wind and SST Variability off the California Coast During Summertime High Wind Events”

Weiguang Wu<sup>1,2</sup>, Ana. B. Villas Bôas<sup>1</sup>, and Sarah. T. Gille<sup>1</sup>

<sup>1</sup>Scripps Institution of Oceanography, University of California San Diego, La Jolla, CA, USA

<sup>2</sup>Now at MIT-WHOI Joint Program in Oceanography/Applied Ocean Sciences and Engineering, Massachusetts Institute of Technology, Cambridge, MA, USA

## Contents of this file

1. Figures S1 to S4

## Introduction

The first three supporting figures here show the evolution of composite mean of wind speed (green dashed lines) and SST (orange dashed lines) for different types of wind events at buoy 46013 (Figure S1), 46012 (Figure S2), and 46028 (Figure S3). The wind events are classified by: (a) Low-speed events: the 90 percentile of wind speed within the event is less than  $15 \text{ m s}^{-1}$ ; (b) Short-duration events: the duration of events is less than 72 hrs; (c) Low-speed long-duration events: the duration is greater than 72 hrs and the 90 percentile speed is less than  $15 \text{ m s}^{-1}$ ; (d) High-speed events: the 90 percentile speed is greater than  $15 \text{ m s}^{-1}$ ; (e) Long-duration events: the duration is greater than 72 hrs;

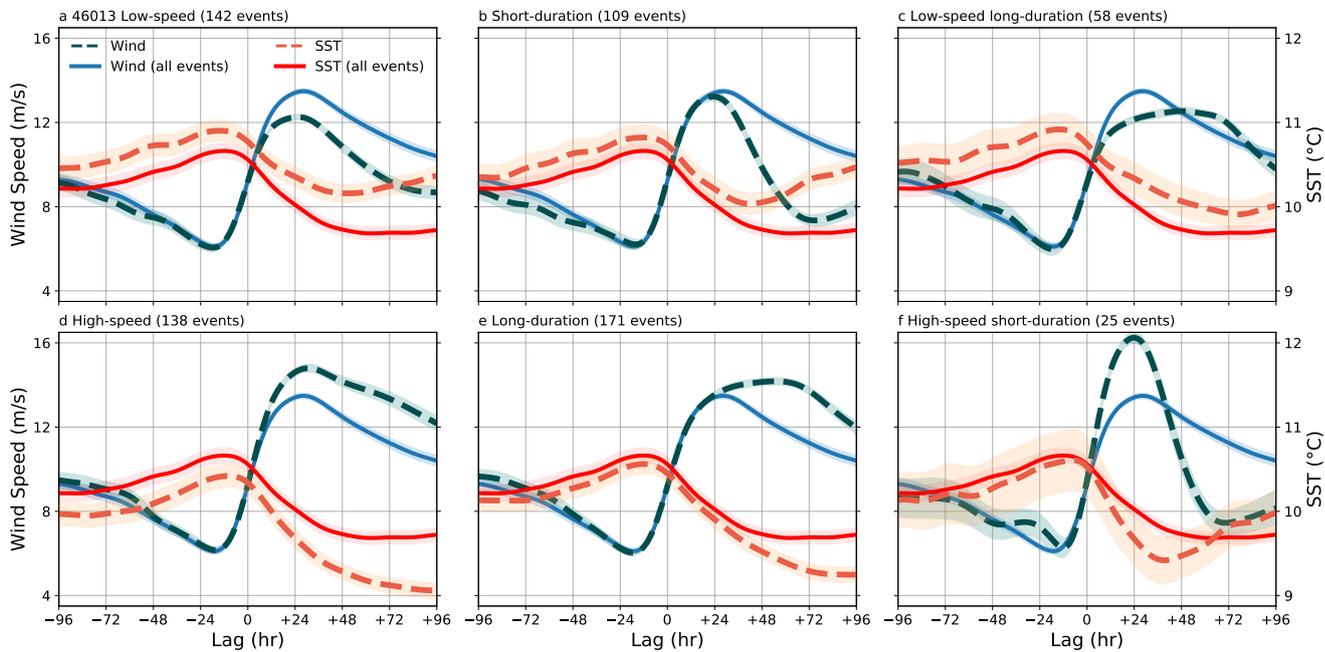
---

(f) High-speed short-duration events: the duration is less than 72 hrs and the 90 percentile speed is greater than  $15 \text{ m s}^{-1}$ . These events were identified from April to July between 1983 and 2014. Events with missing data are not included in the analysis.

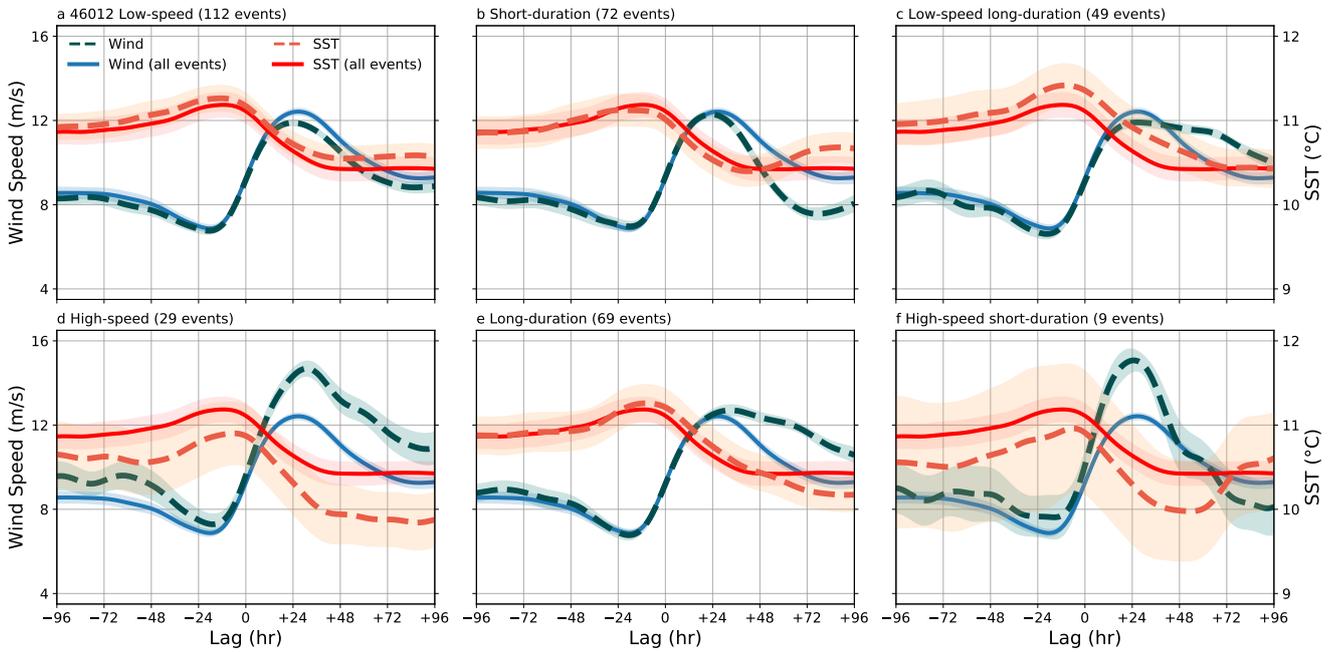
Figure S4 shows the vertical profiles of potential temperature anomaly (red lines) and potential density anomaly (blue lines) at top 100 dbar from an Argo climatology (Roemmich & Gilson, 2009) at nearest point to NDBC buoy 46006 (dashed lines) and buoy 46028 (solid lines). The anomalies at each depth are defined in respect to the surface values. Temperature and density anomalies at every depth are averaged between April and July from 2004 to 2018 using the Argo climatology. Note that both the stratification and temperature are similar at the two buoys locations down to pressure of about 40 dbar.

## References

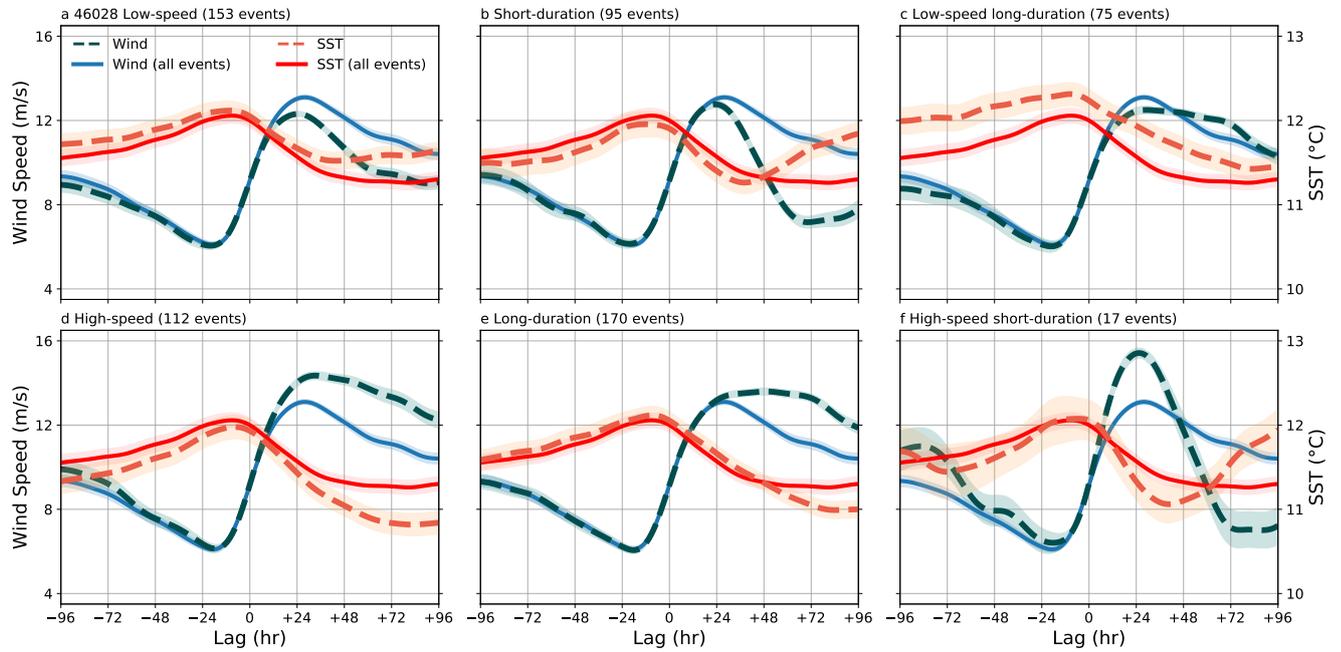
- Roemmich, D., & Gilson, J. (2009). The 2004–2008 mean and annual cycle of temperature, salinity, and steric height in the global ocean from the Argo Program. *Progress in Oceanography*, 82(2), 81–100. Retrieved from <https://doi.org/10.1016/j.pocean.2009.03.004>



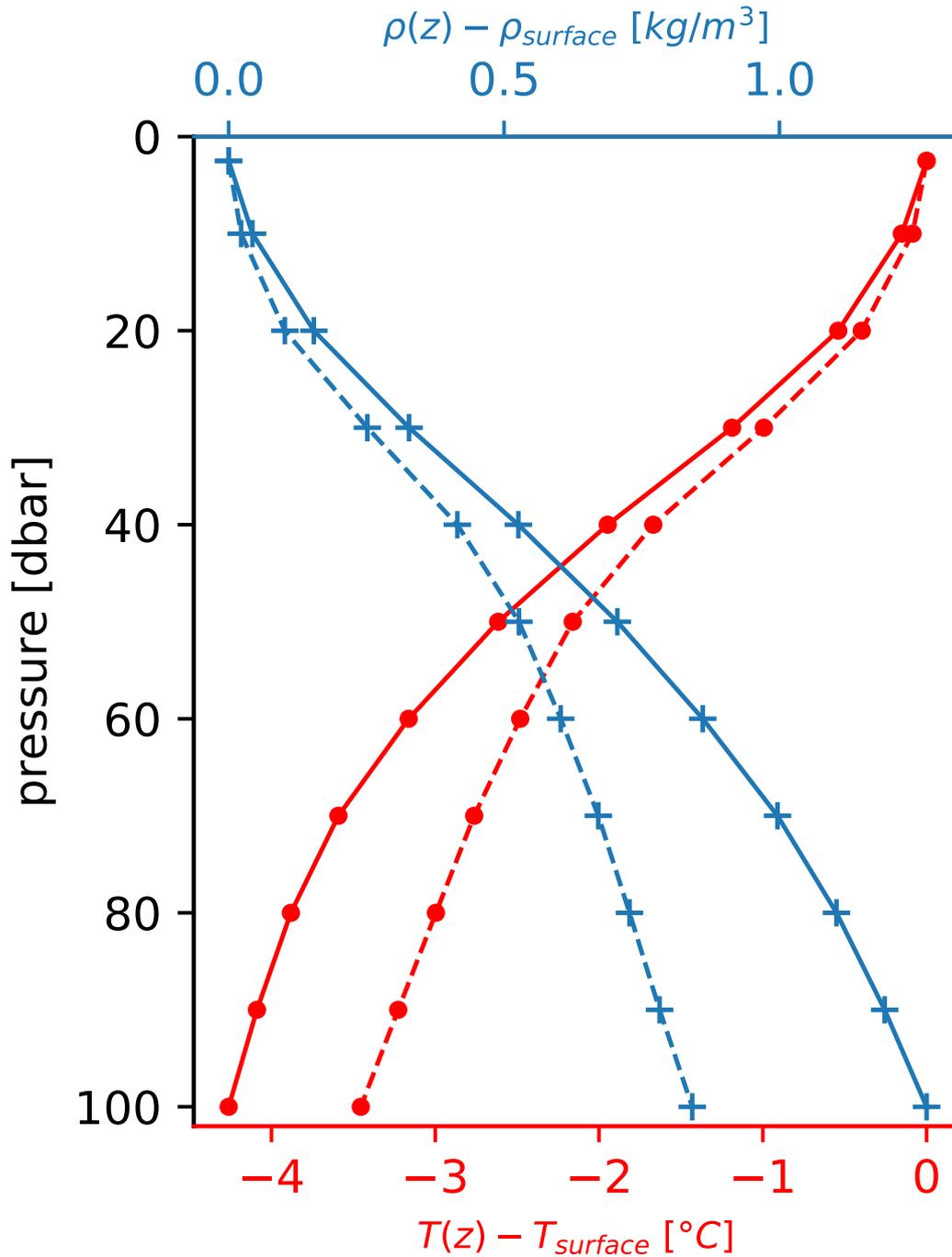
**Figure S1.** Evolution of composite mean of wind speed (green dashed lines) and SST (orange dashed lines) for different types of wind events at buoy 46013. The number of events for each scenario is indicated in the title. Solid lines are the same as in Fig. 5d. The red solid line in each plot is the composite mean of SST and the blue solid line is the composite mean wind speed over all wind events at buoy 46013. Shaded areas correspond to one standard error of the mean for wind speed/SST at each lag hr.



**Figure S2.** Evolution of composite mean of wind speed (green dashed lines) and SST (orange dashed lines) for different types of wind events at buoy 46012. The number of events for each scenario is indicated in the title. Solid lines are the same as in Fig. 5c. The red solid line in each plot is the composite mean of SST, and the blue solid line is the composite mean wind speed over all wind events at buoy 46012. Shaded areas correspond to one standard error of the mean for wind speed/SST at each lag hr.



**Figure S3.** Evolution of composite mean of wind speed (green dashed lines) and SST (orange dashed lines) for different types of wind events at buoy 46028. The number of events for each scenario is indicated in the title. Solid lines are the same as in Fig. 5b. The red solid line in each plot is the composite mean of SST over all wind events, and the blue line is the composite mean wind speed at buoy 46028. Shaded areas correspond to one standard error of the mean for wind speed/SST at each lag hr.



**Figure S4.** Vertical Argo profiles of potential temperature anomaly (red lines) and potential density anomaly (blue lines) at the nearest point to NDBC buoy 46006 (dashed lines) and buoy 46028 (solid lines). The anomalies at each depth are defined in respect to the surface values. Temperature and density anomalies at every depth are averaged between April and July from 2004 to 2018 using the Argo climatology.