Supporting Information for Upper ocean changes with hurricane-strength wind events: a study using Argo profiles and an ocean reanalysis

Jacopo Sala[1], Donata Giglio[1], Addison Hu[2], Mikael Kuusela[2], Kimberly M. Wood[3], Ann B. Lee[2]

[1]University of Colorado - Boulder, Department of Atmospheric and Oceanic Sciences

[2]Carnegie Mellon University, Department of Statistics and Data Science

[3]University of Arizona, Department of Hydrology and Atmospheric Sciences

Contents of this file

Figures S1 to S3.

Introduction

Figures S1-S3 in the following provide additional context for our analysis and discussion.

April 22, 2024, 9:17pm

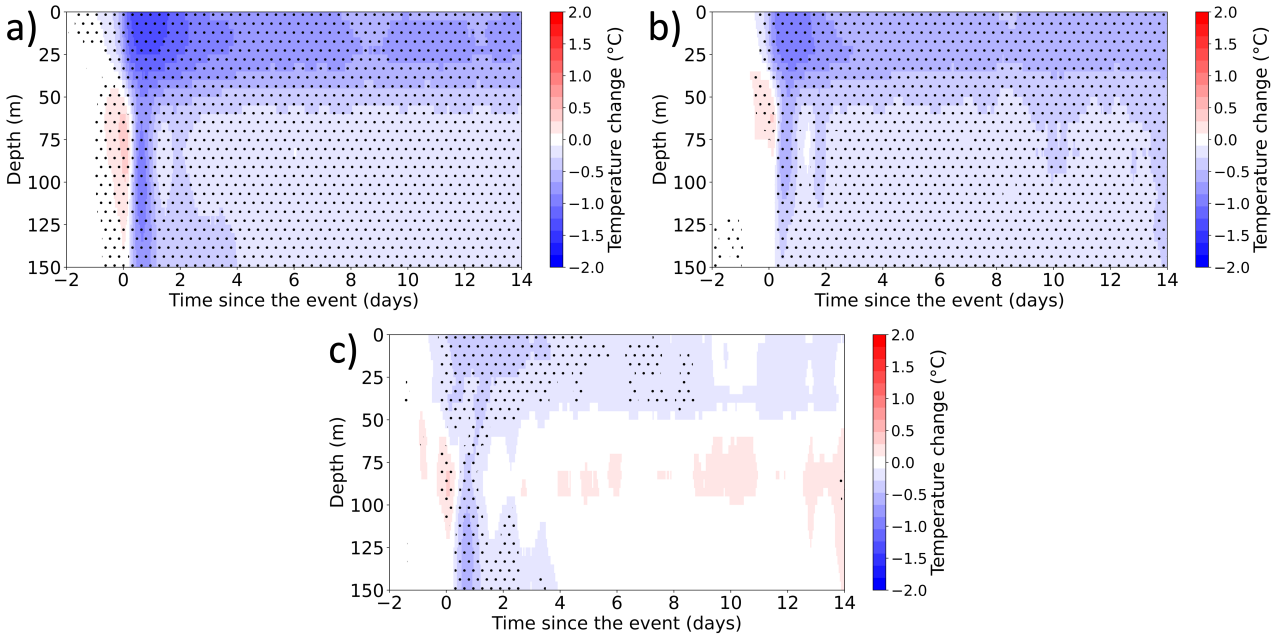

Figure S1. Upper ocean temperature changes during hurricane-strength wind events, based on the HYCOM reanalysis. Composite changes are shown for regions where pre-event upper ocean salinity increases (a) vs decreases (b) with depth. Panel (c) shows the difference between the "increasing" case (i.e., panel a) and the "decreasing" case (i.e., panel b). Dots indicate statistically significant values (95% confidence limit).

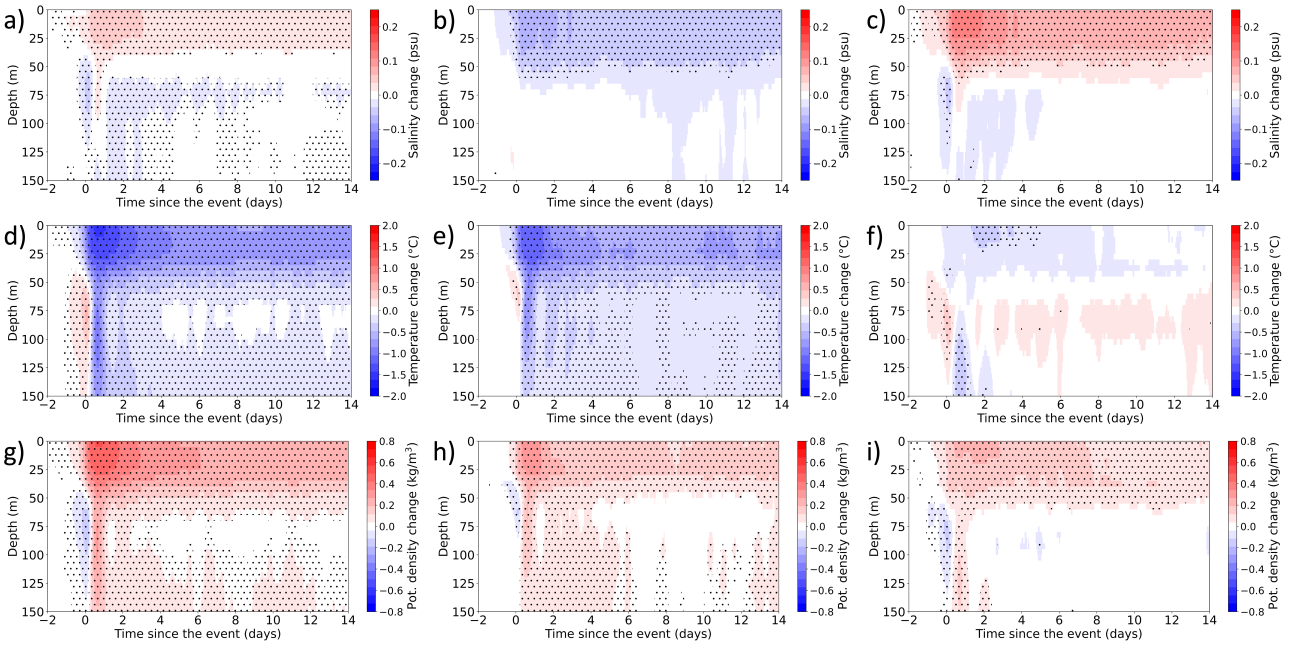

Figure S2. Upper ocean salinity (a, b, c), temperature (d, e, f) and potential density (g, h, i) changes during hurricane-strength wind events where a pre-event barrier layer is not present. Composite changes are shown based on the HYCOM reanalysis for regions where pre-event upper ocean salinity increases (a, d, g) vs decreases (b, e, h) with depth. Panels (c, f, i) show the difference between the "increasing" case (i.e., panel a, d, g) and the "decreasing" case (i.e., panel b, e, h). Dots indicate statistically significant values (95% confidence limit).

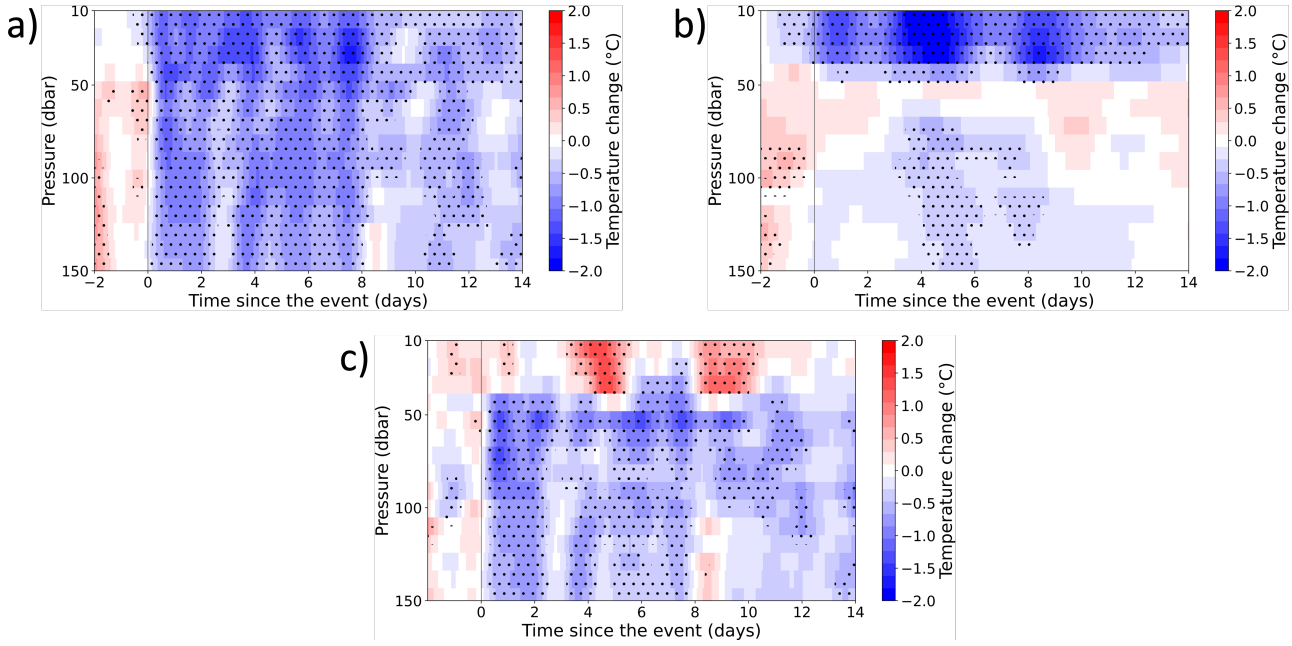

Figure S3. Upper ocean temperature changes within 0.5 degrees in cross track angle from the TC track during hurricane-strength TCs, based on Argo observations. Changes are shown for regions where pre-event upper ocean salinity increases (a) vs decreases (b) with depth. Panel (c) shows the difference between the "increasing" case (i.e., panel a) and the "decreasing" case (i.e., panel b). In all panels, a point-wise $\alpha = 0.05$ hypothesis test is performed and used to indicate (with dots) where the null hypothesis is rejected.