# Supporting Information for "Eddy induced trapping and homogenization of freshwater in the Bay of Bengal"

Nihar Paul[1], Jai Sukhatme[1,2], Debasis Sengupta[1,2]and Bishakhdatta Gayen[1,3]

[1]Centre for Atmospheric and Oceanic Sciences, Indian Institute of Science, Bangalore - 560012, India.

[2]Divecha Centre for Climate Change, Indian Institute of Science, Bangalore - 560012, India.

[3]Mechanical Engineering Department, University of Melbourne, Australia.

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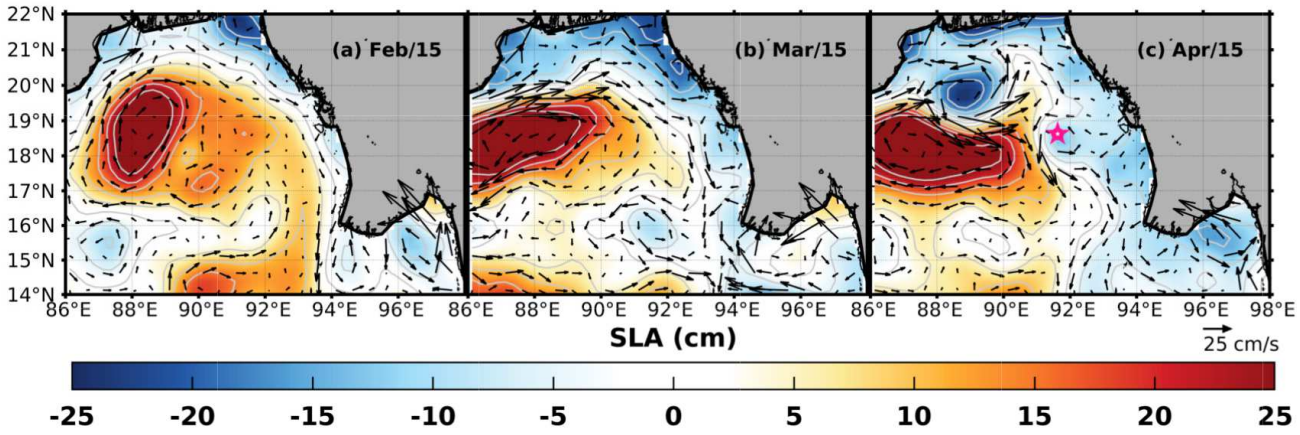


**Figure S1.** Sea level anomaly (SLA) contours with geostrophic quiver on 1st day of month for February (a), March (b) and April (c), 2015. The contours of SLA are in the range of -25 cm to 25 cm with an interval of 5 cm. The centre of the eddy (defined by minimum of SLA within the periphery of the eddy) is marked by the symbol "star" in (c).

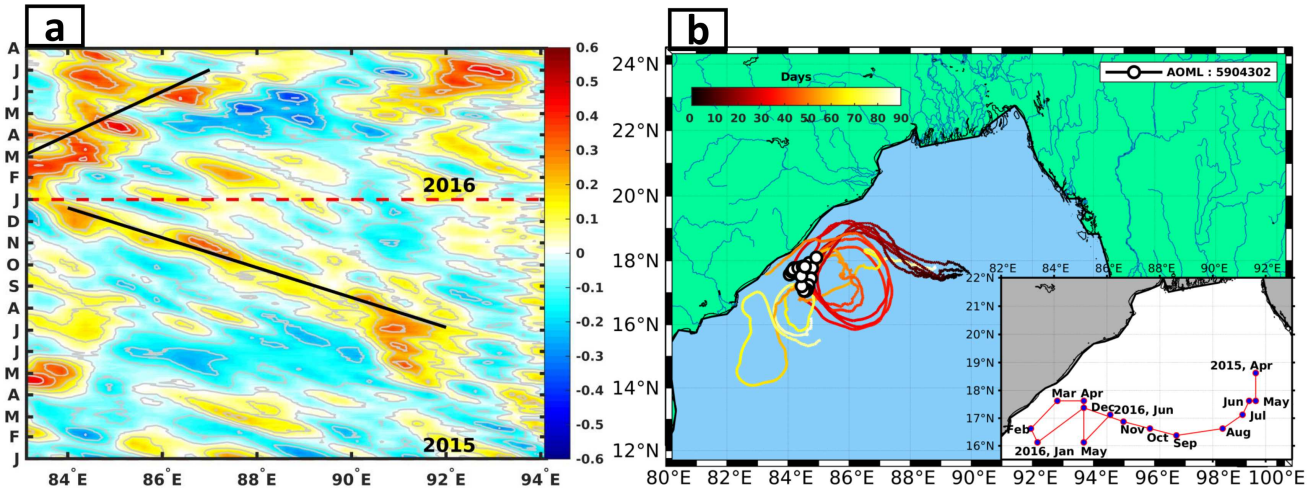


**Figure S2.** (a) Hovmöller diagram of Rossby number ($\xi/f$) computed from geostrophic currents averaged over 16.625°N-17.625°N shown for the year 2015-2016. (b) Track of Argo float (AOML-5904302) and trajectories of Surface Velocity Program (SVP) "drifters" (drouged at 15 m depth) within the eddy from 01/10 to 31/12 of 2015 and entire track of eddy in inset from the first day of April 2015 to June 2016 in an interval of a month.

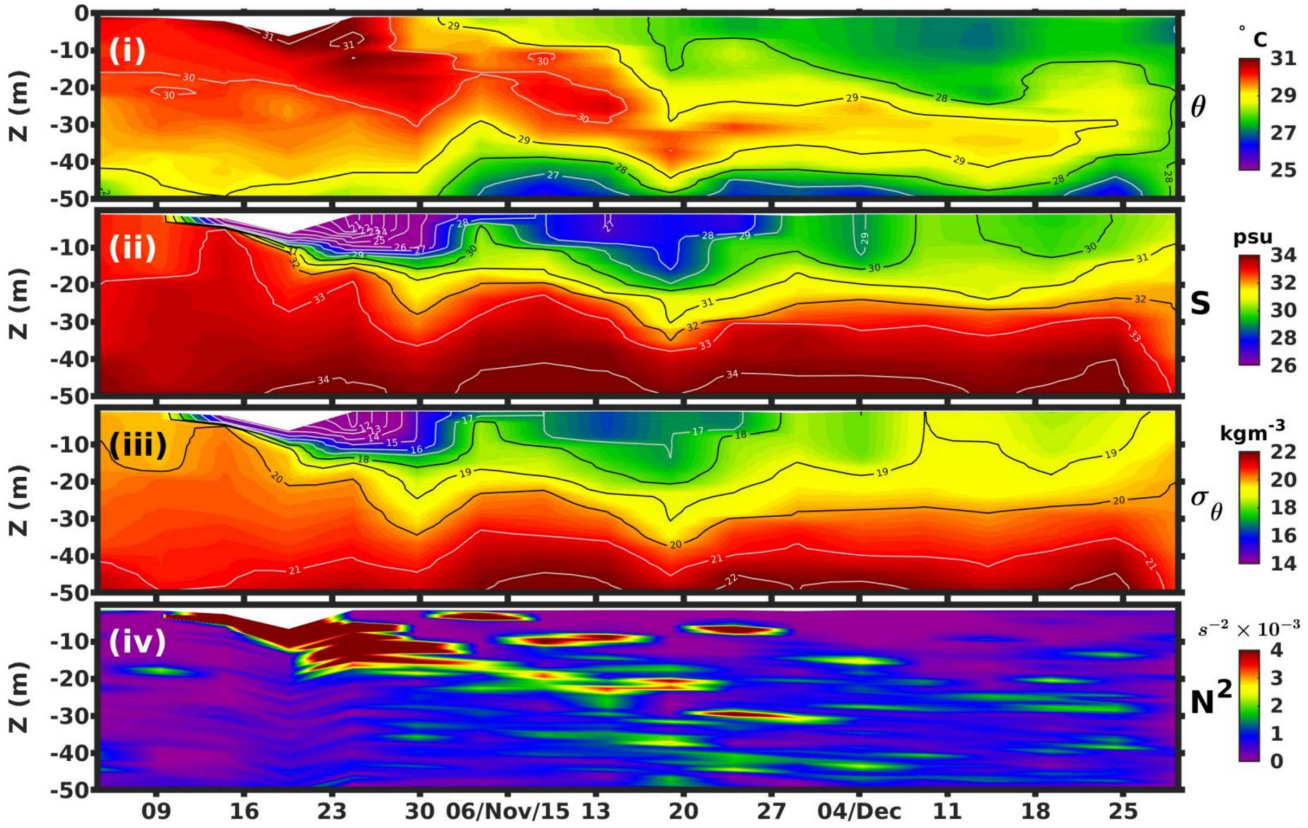


**Figure S3.** (i) Potential temperature ($\theta$), (ii) salinity (S), (iii) potential density ($\sigma_\theta$) and (iv) squared Brunt-väisälä frequency ($N^2$), respectively with depth using Argo AOML-5904302 data for the upper 50 m from October to December, 2015.

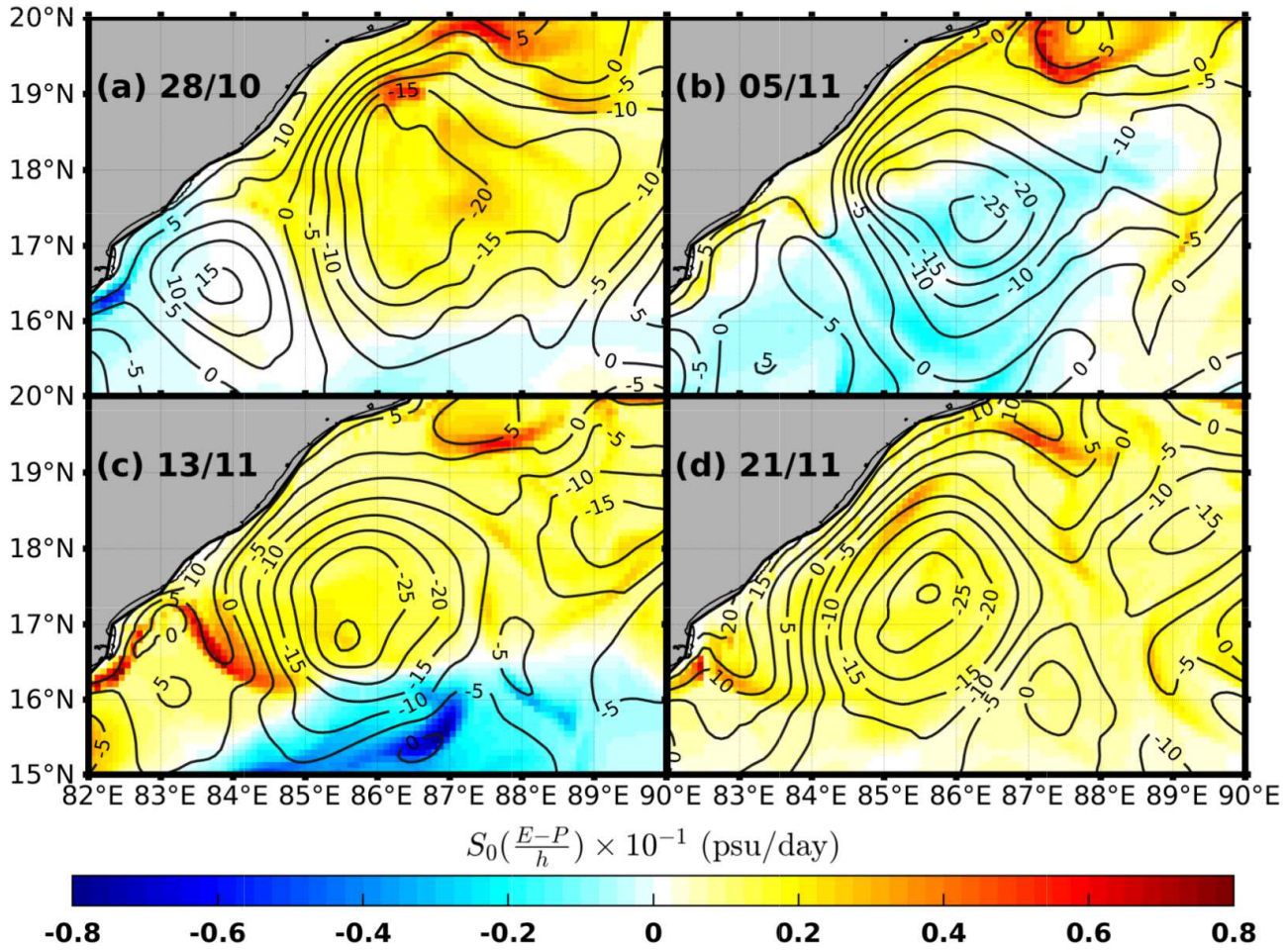


**Figure S4.** Evolution of contribution to mixed layer salinity change by $E - P$ (Evaporation- Precipitation rates).

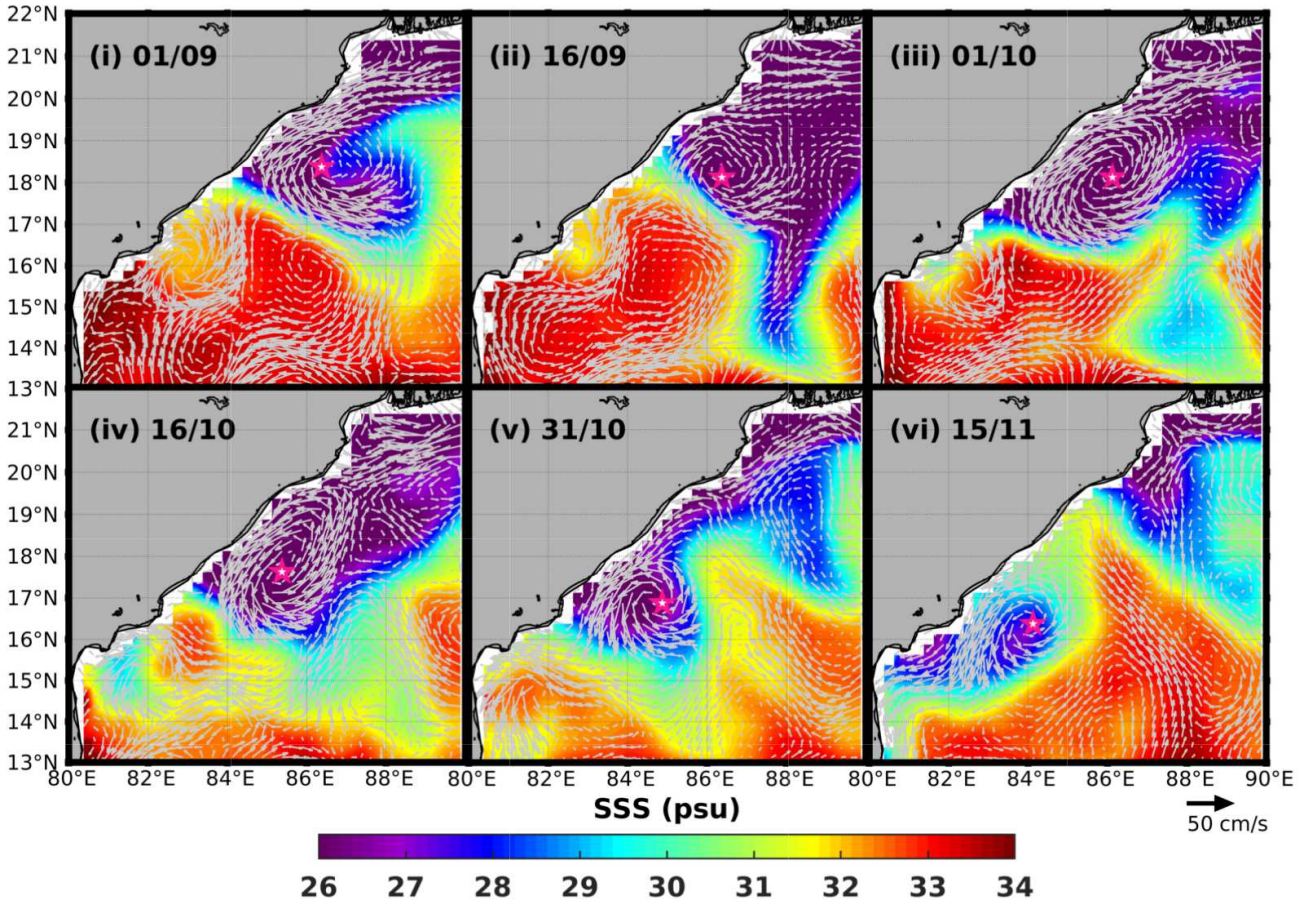


**Figure S5.** (i)-(vi) SSS with geostrophic current quivers from 1st September 2017 to 15th November 2017 in intervals of 15 days. "star" indicates the eddy's SLA minimum (centre).

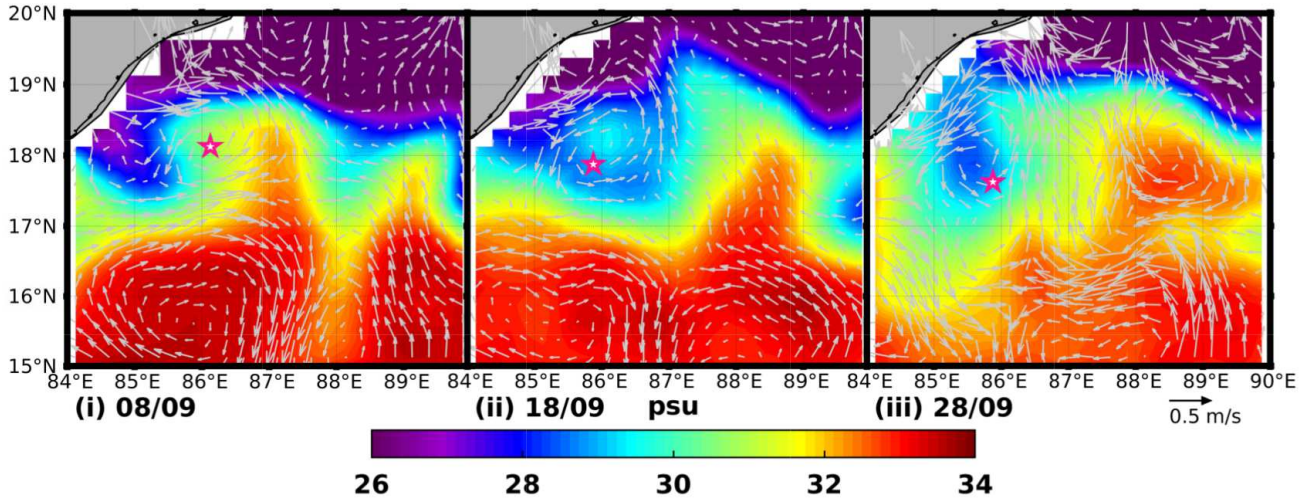


**Figure S6.** (i)-(iii) SSS with geostrophic current quivers from 1st September 2020 to 15th November 2020 in intervals of 15 days. "star" indicates the eddy's SLA minimum (centre). The entry of freshwater takes place within 10 days as can be seen by comparing (i) and (ii).

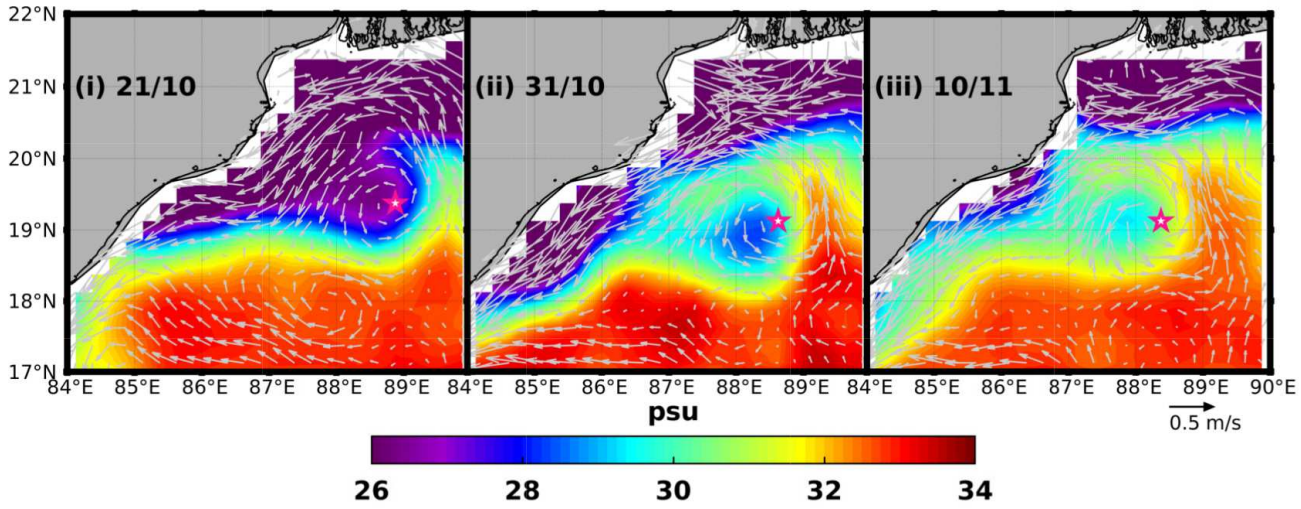


**Figure S7.** (i)-(iii) SSS with geostrophic current quivers from 8th September 2020 to 28th September 2020 in intervals of 10 days. "star" indicates the eddy's SLA minimum (centre).

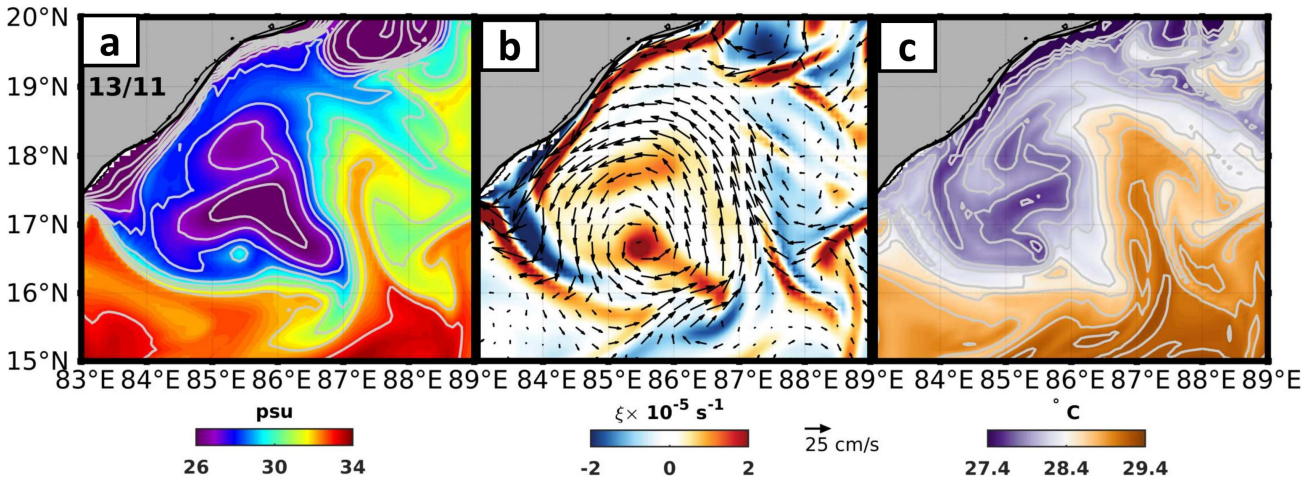


**Figure S8.** (a) SSS with contours with an interval of 1 psu (b) vorticity with surface current quivers (c) SST with contours with an interval of 0.2°C at 0.5 m depth on 13/11/2015 from NEMO reanalysis data.

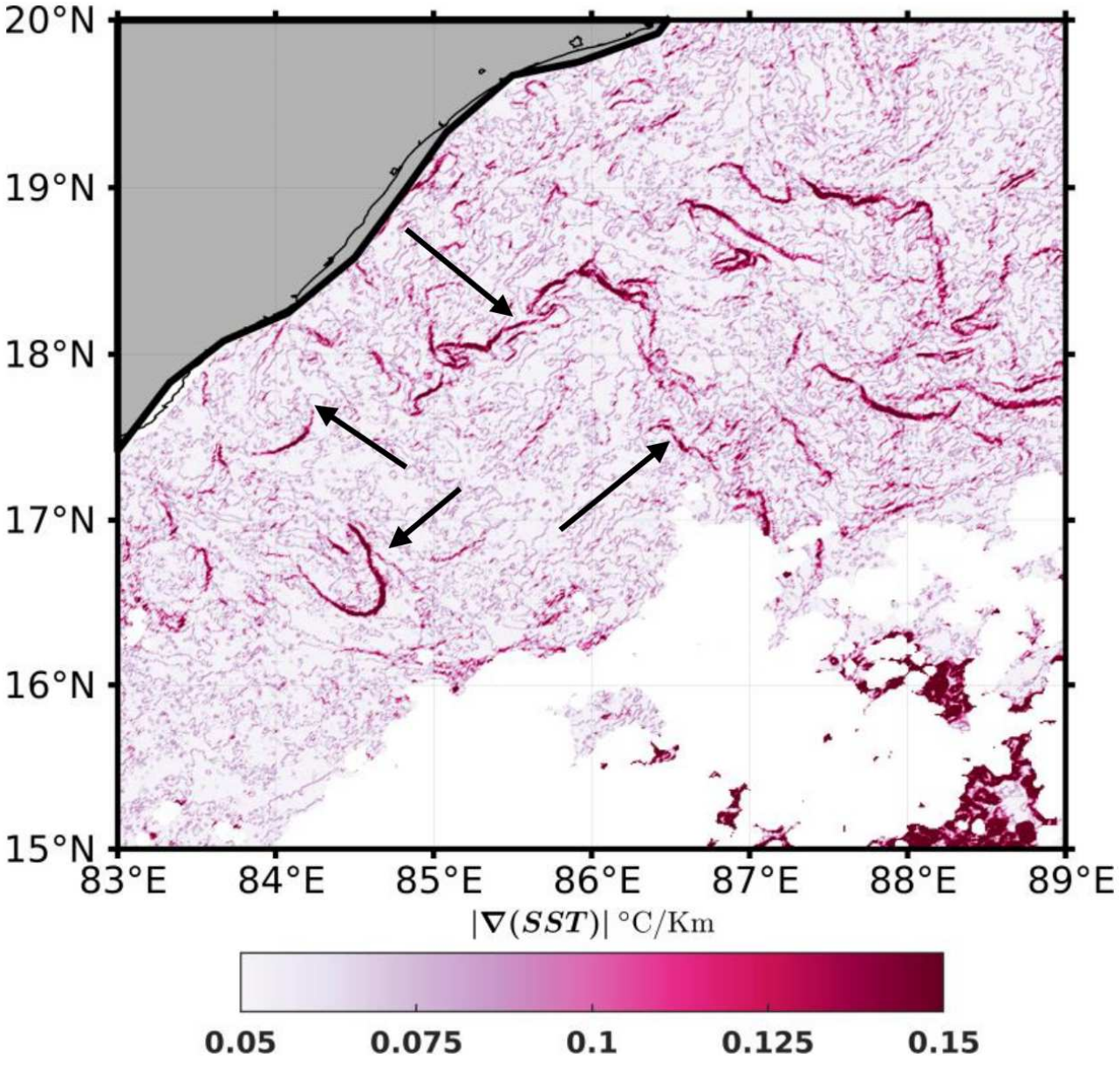


**Figure S9.** The magnitude of the gradient of METOP2-AVHRR SST (° C/km) on 13/11/2015. The four arrows point to thermal fronts ($|\nabla SST| > 0.1$°C/Km) around the periphery of the eddy.