

Figure S1: The monthly variation of the velocities offshore of the East India Coastal Current (EICC, the western boundary current in the Bay of Bengal) at different latitudes (zonally average of 2° in the offshore direction), the light red arrows represent the average wind field at different latitudes. The climatological surface currents and wind fields are from monthly averaged global current products MULTI-OBS_GLO_PHY_REP_015_004 and wind products WIND_GLO_WIND_L4_REP_OBSERVATIONS_012_003 with 0.25° grid, respectively (available on <http://marine.copernicus.eu/>).

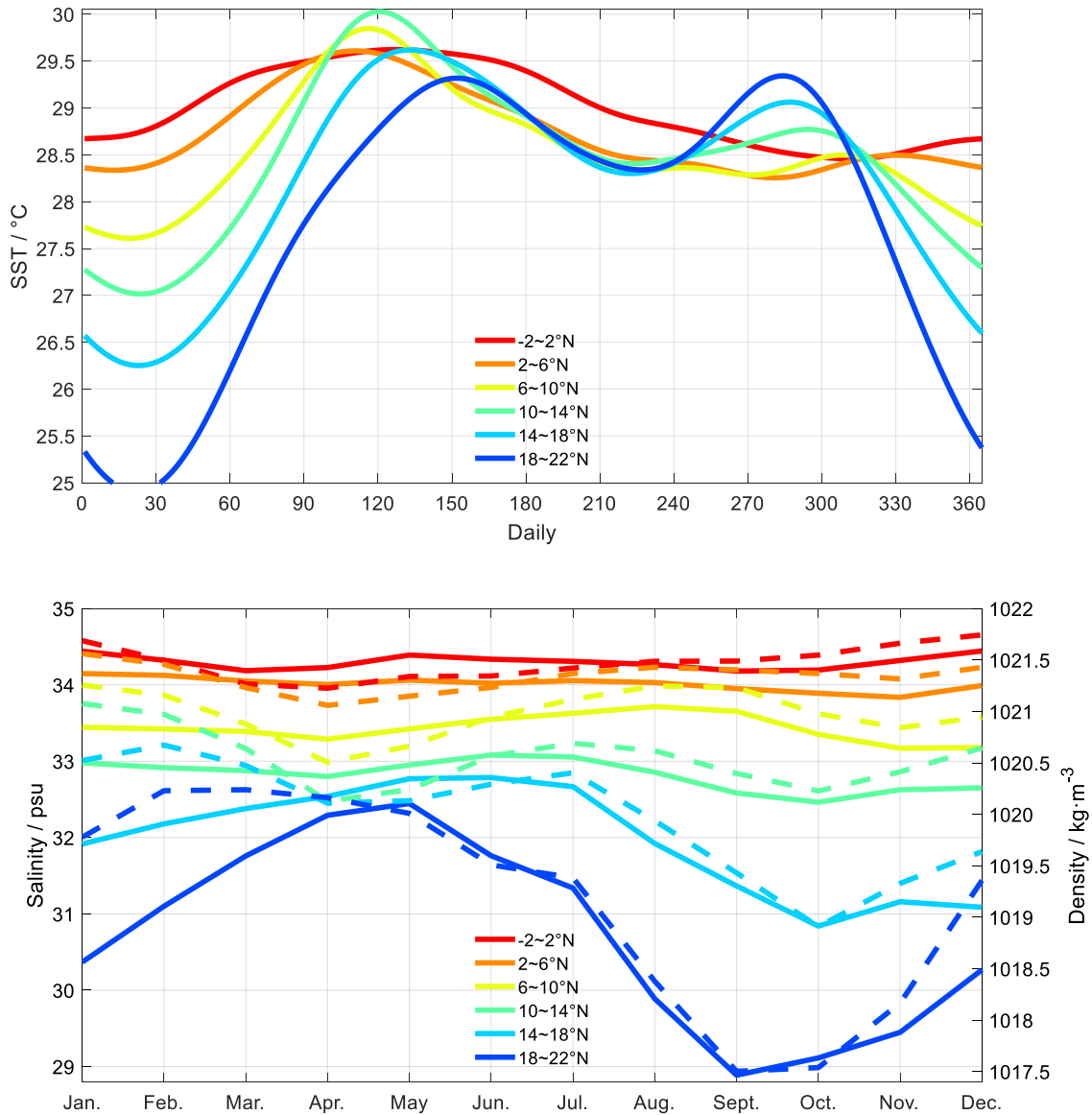


Figure S2: (upper) The climatological daily mean sea surface temperature, and (lower) climatological monthly mean salinity (solid lines) and density (dashed lines) in different latitude regions (color lines) in the Bay of Bengal. The climatological sea surface temperature fields are from climatological daily OISST dataset with 0.25° regular grid at global scale from Jan. 1982 to Dec. 2011 (Banzon et al., 2014). The climatological surface salinity and density are from the global SSS/SSD L4 Reprocessed dataset (MULTIOBS_GLO_PHY_REP_015_002) with 0.25° grid from Jan. 1993 to Dec. 2018 (Mertz et al., 2018).

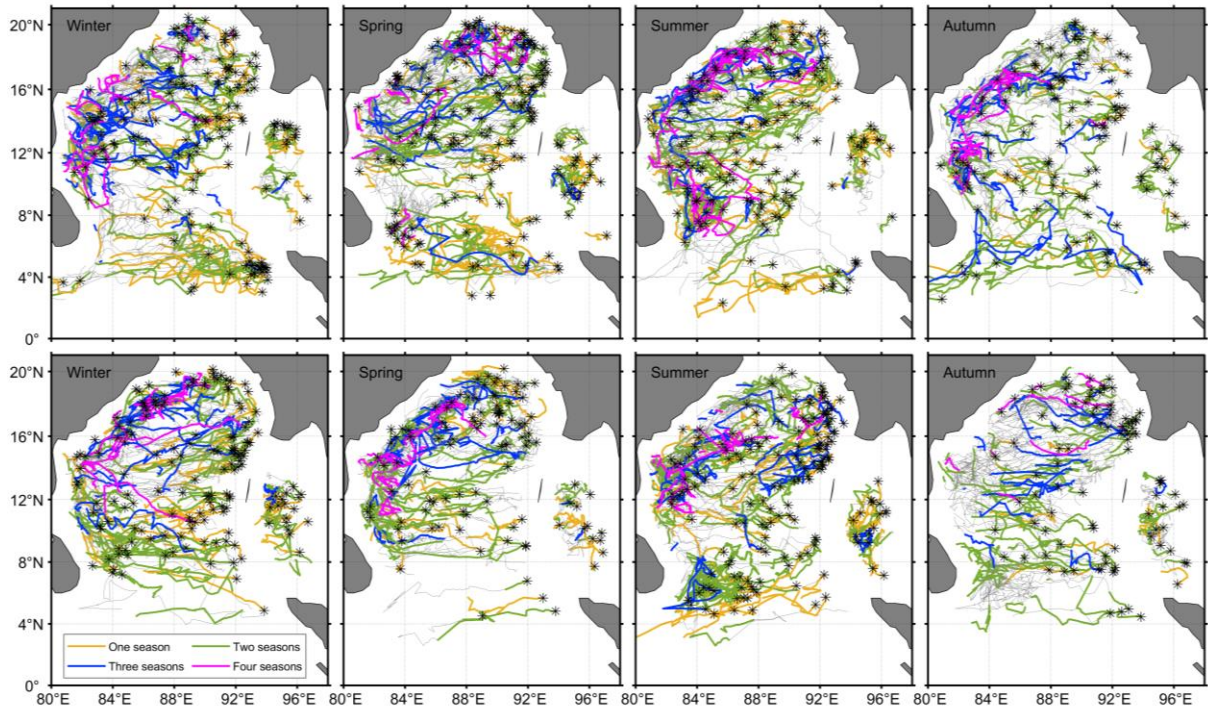


Figure S3: The trajectories of the cyclonic (upper panels) and anticyclonic (lower panels) eddies with lifetimes ≥ 30 days in different seasons based on daily SLA fields spanned a 26-year period from January 1993 through February 2019. The locations where eddy trajectories appear are indicated by asterisks. The part of an eddy trajectory in the season is marked with a color line, and the part out of the season is marked with a thin gray line. The existence of eddy trajectories in different seasons is indicated by different colors. For example, an eddy trajectory is marked in green, indicating that the trajectory exists within two seasons.

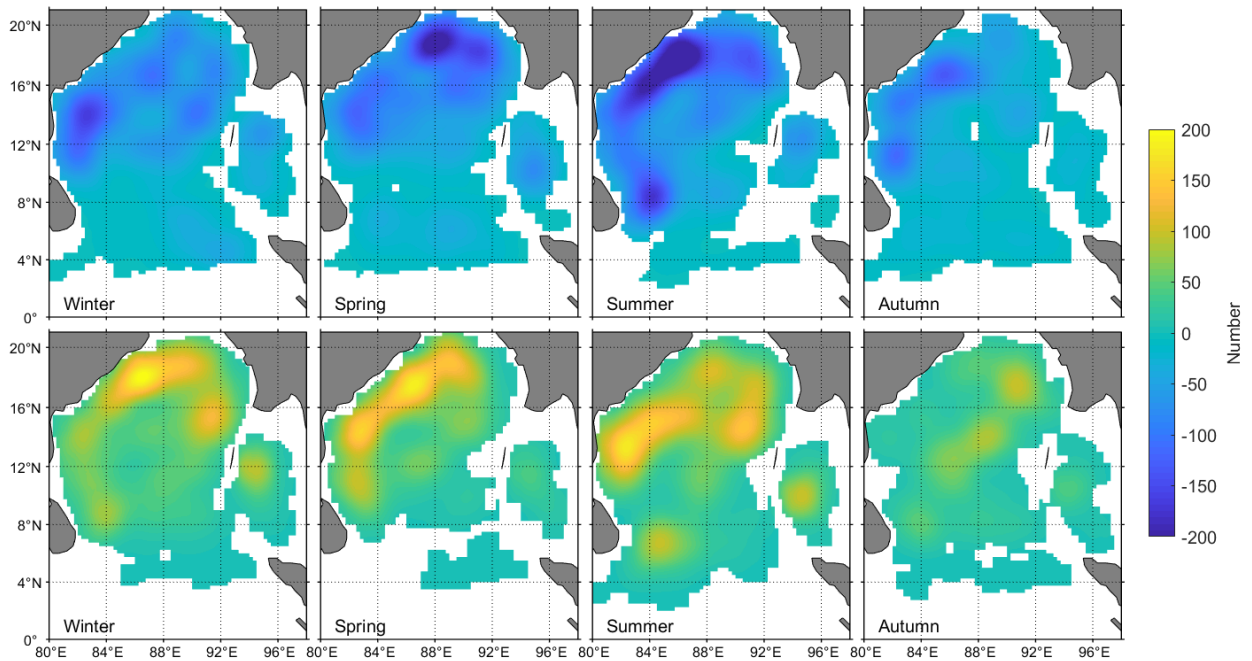


Figure S4: Seasonal geographic distributions for the numbers of eddy interiors that passed through each $1^\circ \times 1^\circ$ region for cyclonic (upper panels) and anticyclonic (lower panels) eddies with lifetimes ≥ 30 days based on daily SLA fields spanned a 26-year period from January 1993 through February 2019. Negative values represent the number of cyclonic eddies, and positive values represent the number of anticyclonic eddies.