

Figure S1: Characterization and identification of mesoscale features using AVISO merged sea level anomaly (SLA) observations. a) merged MSLA observations for the North Central Atlantic Ocean, b) second-order polynomial surface fit over the MSLA observations, c) long-term standard deviation of the MSLA field for 713 weeks of observation, d) scale adjusted MSLA used to detect mesoscale eddies (defined as the difference between the AVISO fields and the second-order polynomial surface divided by the long-term standard deviation field), e) identified positive (anticyclonic) features using a criteria where the scale adjusted MSLA is greater than 3 (P3 eddies), and f) the next week's P3 eddies. A similar analysis is performed for negative (cyclonic) eddy features (N3 eddies).

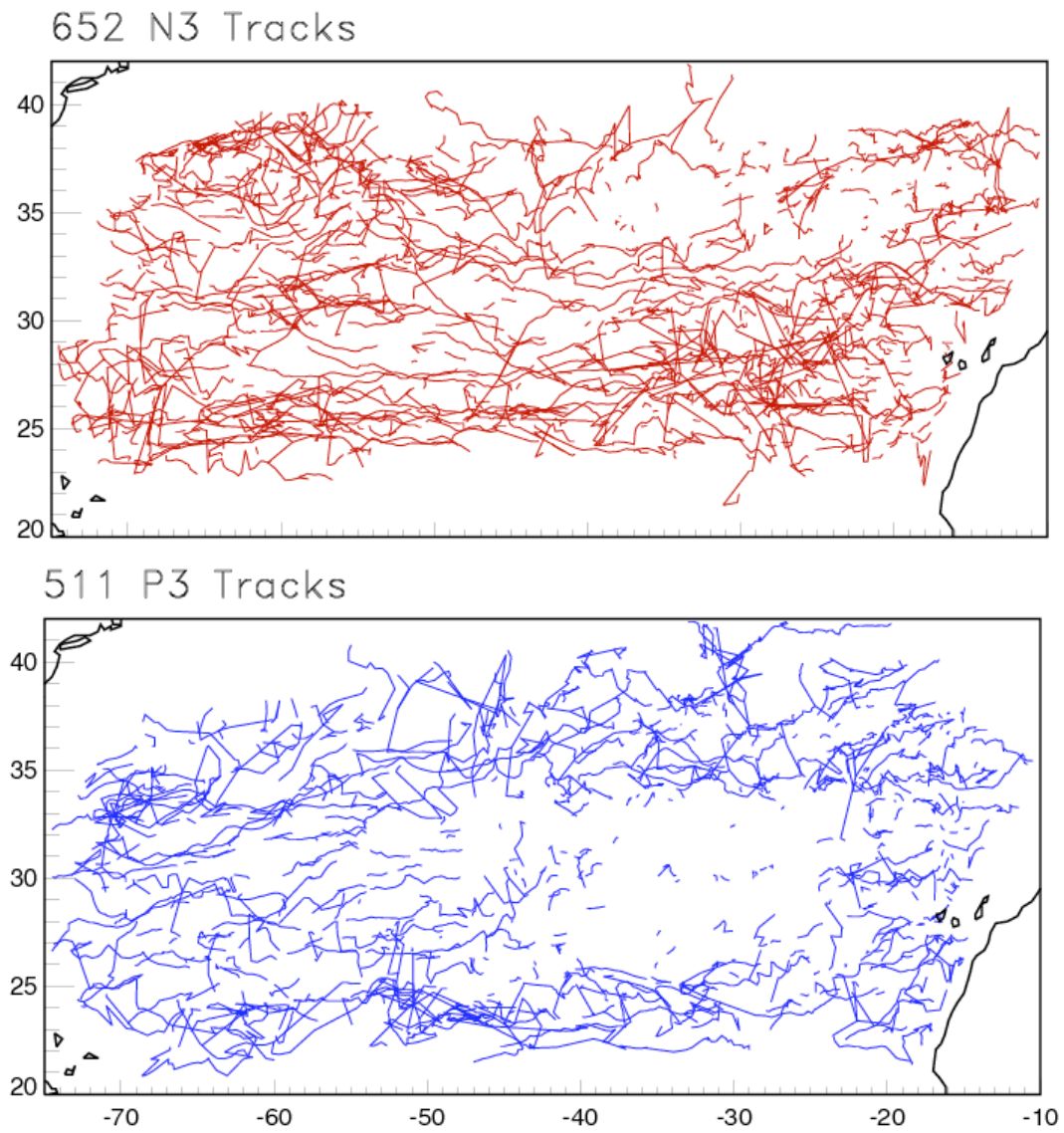


Figure S2: Eddy tracks with ages greater than 3 weeks. Cyclones in upper panel and anticyclones in lower.

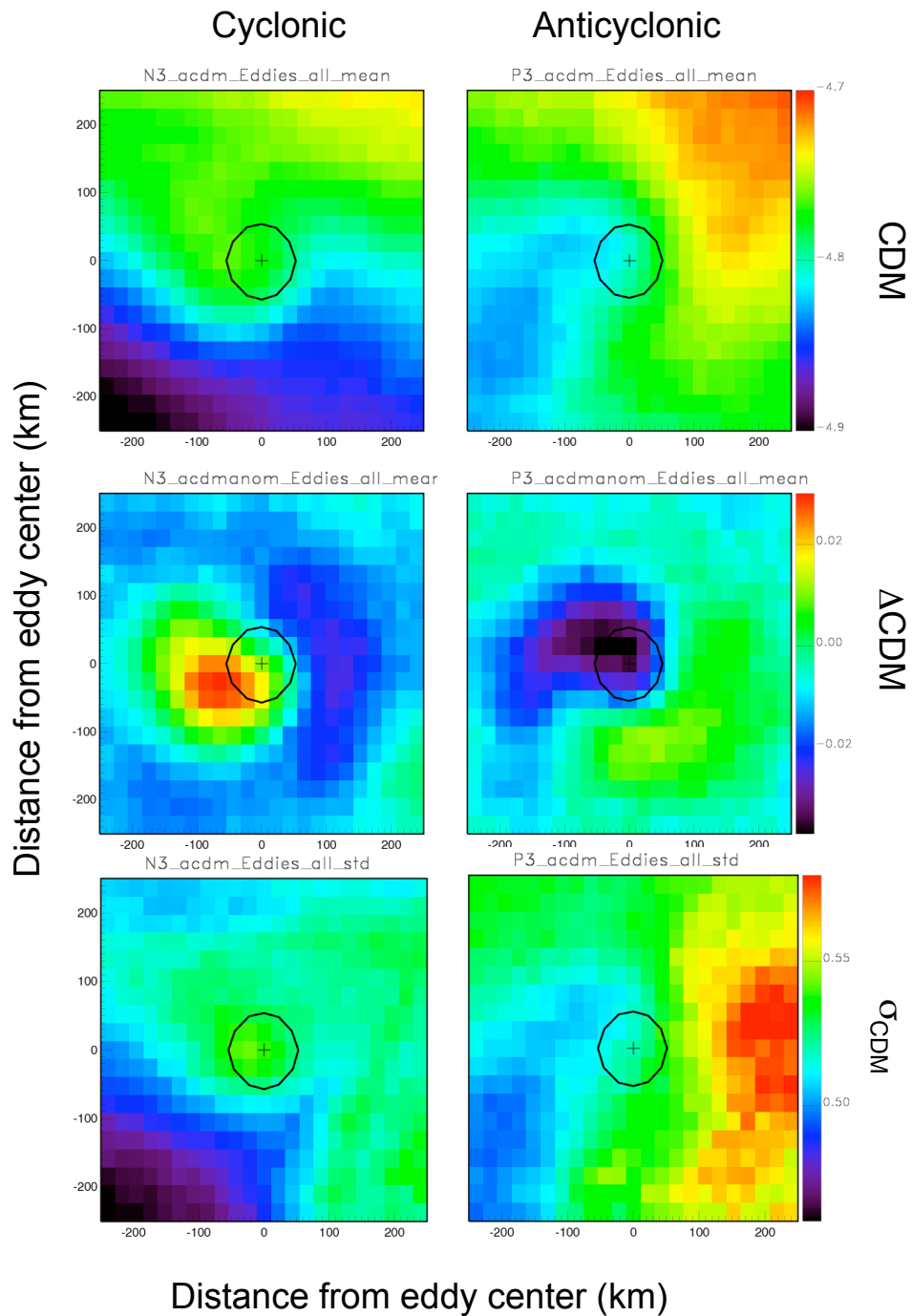


Figure S3: Plan-view depictions of log-transformed CDM retrievals (top panels), the anomaly of log-transformed CDM (Δ CDM, middle panels) and the standard deviation of the log-transformed CDM anomaly (bottom panels) for all cyclonic (left panels) and anticyclonic (right panels) eddies for eddies identified with trajectories longer than 3 weeks. Panels are 500 km on a side centered on the eddy center. The black circle is the trace of an average eddy size. A total of 8093 cyclonic and 6105 anticyclonic eddy-centric images were used to construct these plan view depictions.

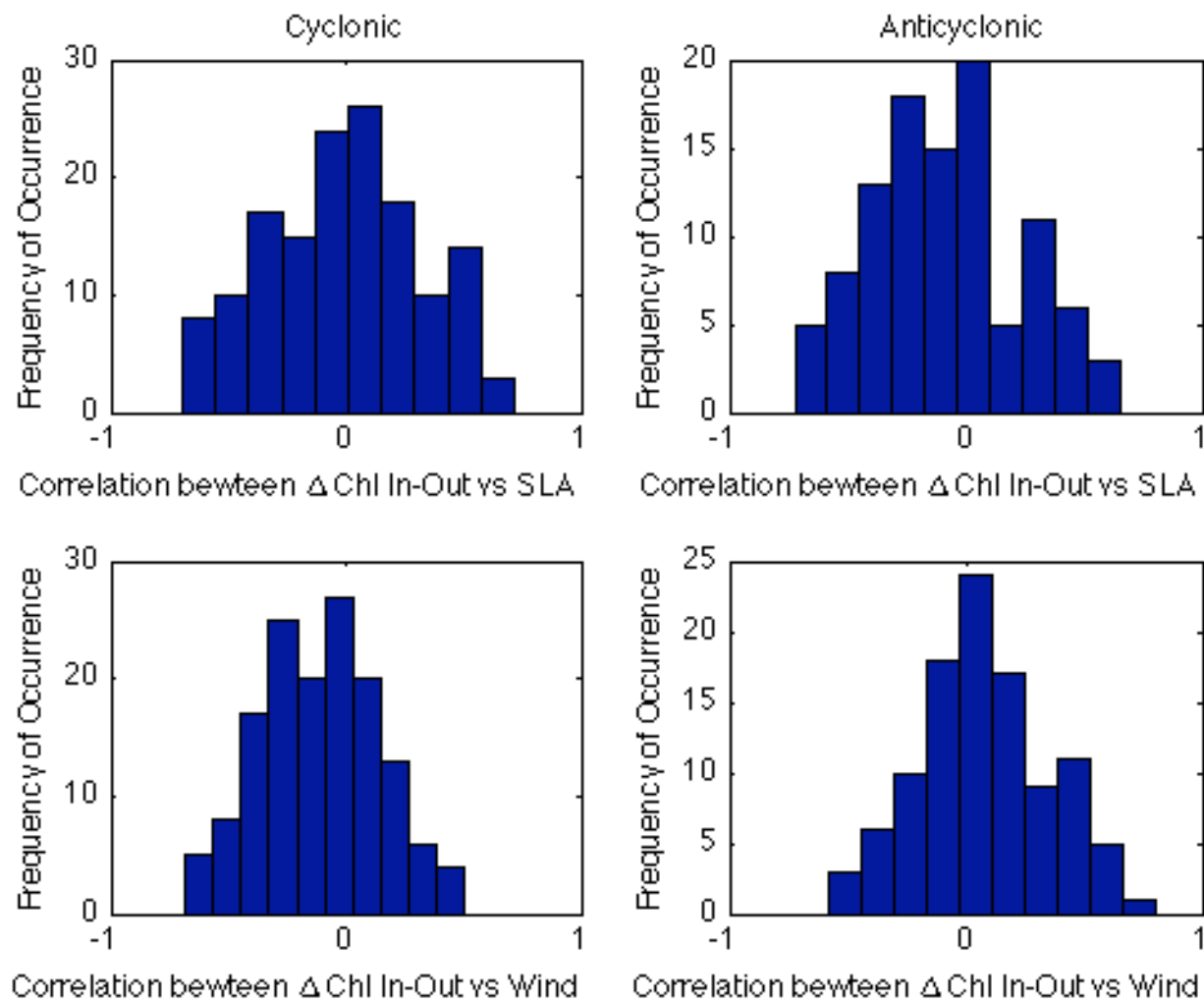


Figure S4: Histograms of the alongtrack correlation coefficients (r) for the difference in the inside vs. outside ΔChl and the eddy sea level anomaly (upper panels) and wind speed (lower panels) for all cyclonic (left panels) and anticyclonic (right panels) eddies. Only track lengths longer or equal to 15 weeks are used.

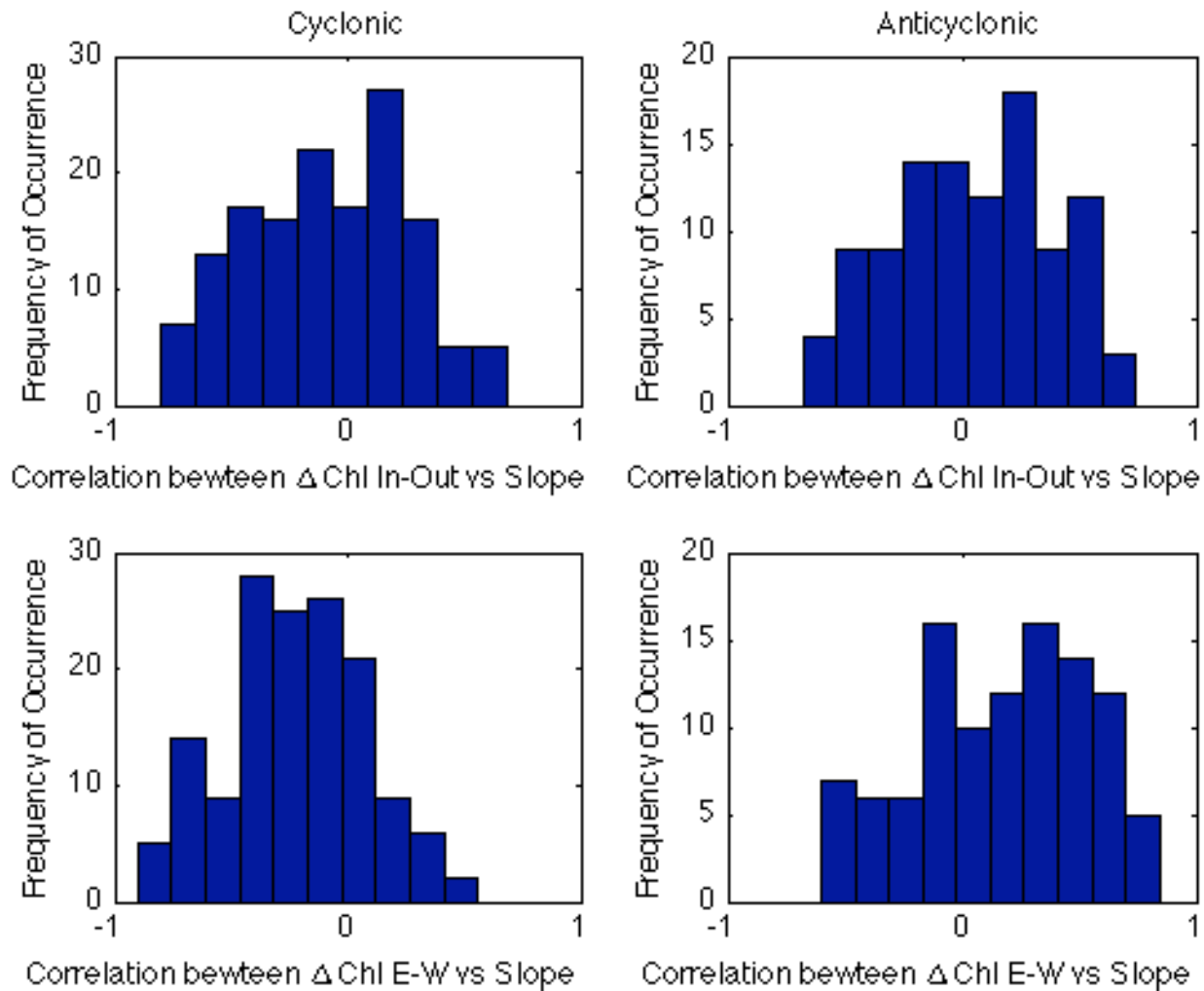


Figure S5: Histograms of the alongtrack correlation coefficients (r) for the the large scale meridional slope of the Chl distribution and the differences in the inside vs. outside ΔChl (upper panels) and the differences in the east vs. west ΔChl (signal lower panels) for all cyclonic (left panels) and anticyclonic (right panels) eddies. Only track lengths longer or equal to 15 weeks are used.

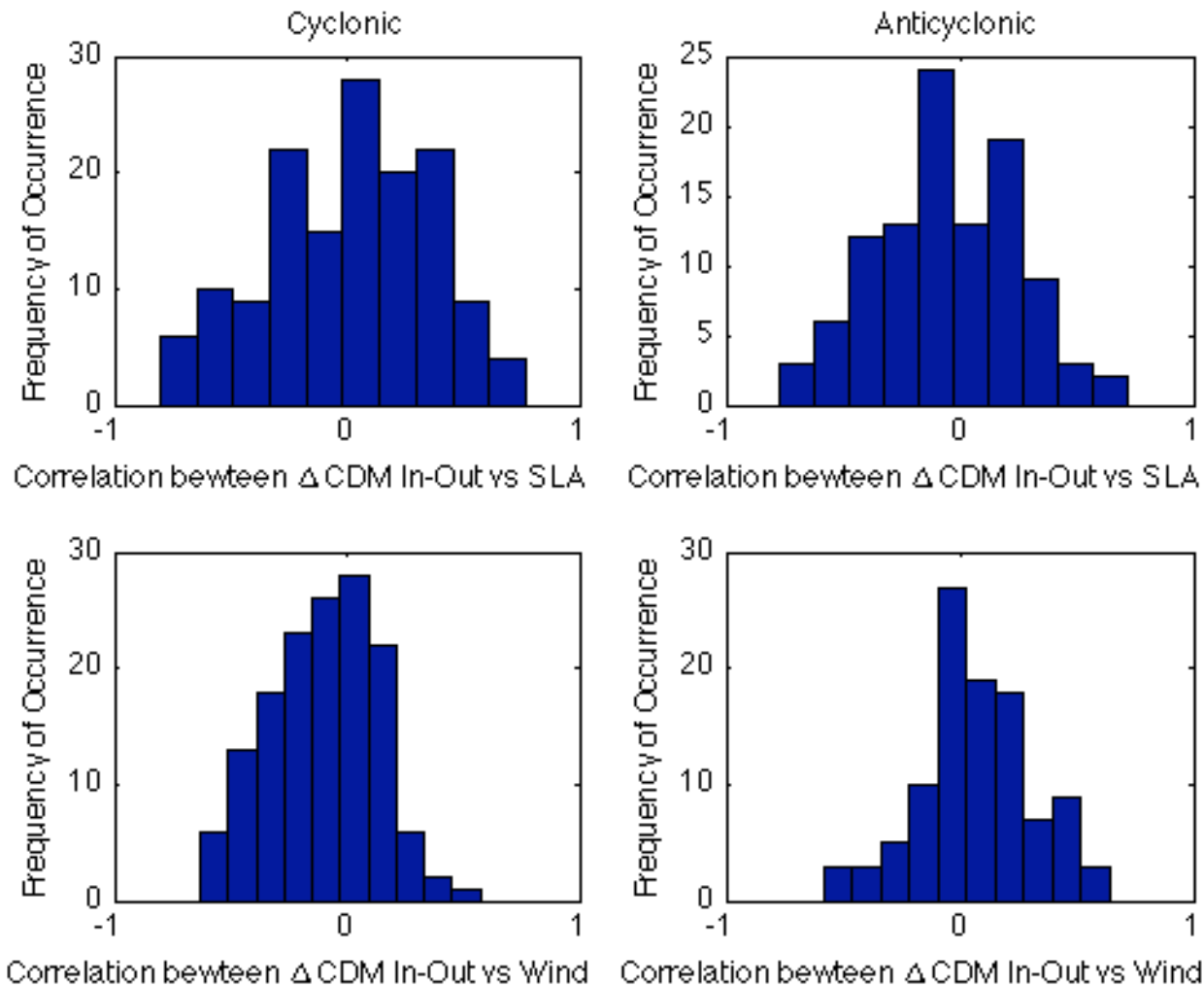


Figure S6: Histograms of the alongtrack correlation coefficients (r) for the difference in the inside vs. outside Δ CDM and the eddy sea level anomaly (upper panels) and wind speed (lower panels) for all cyclonic (left panels) and anticyclonic (right panels) eddies. Only track lengths longer or equal to 15 weeks are used.

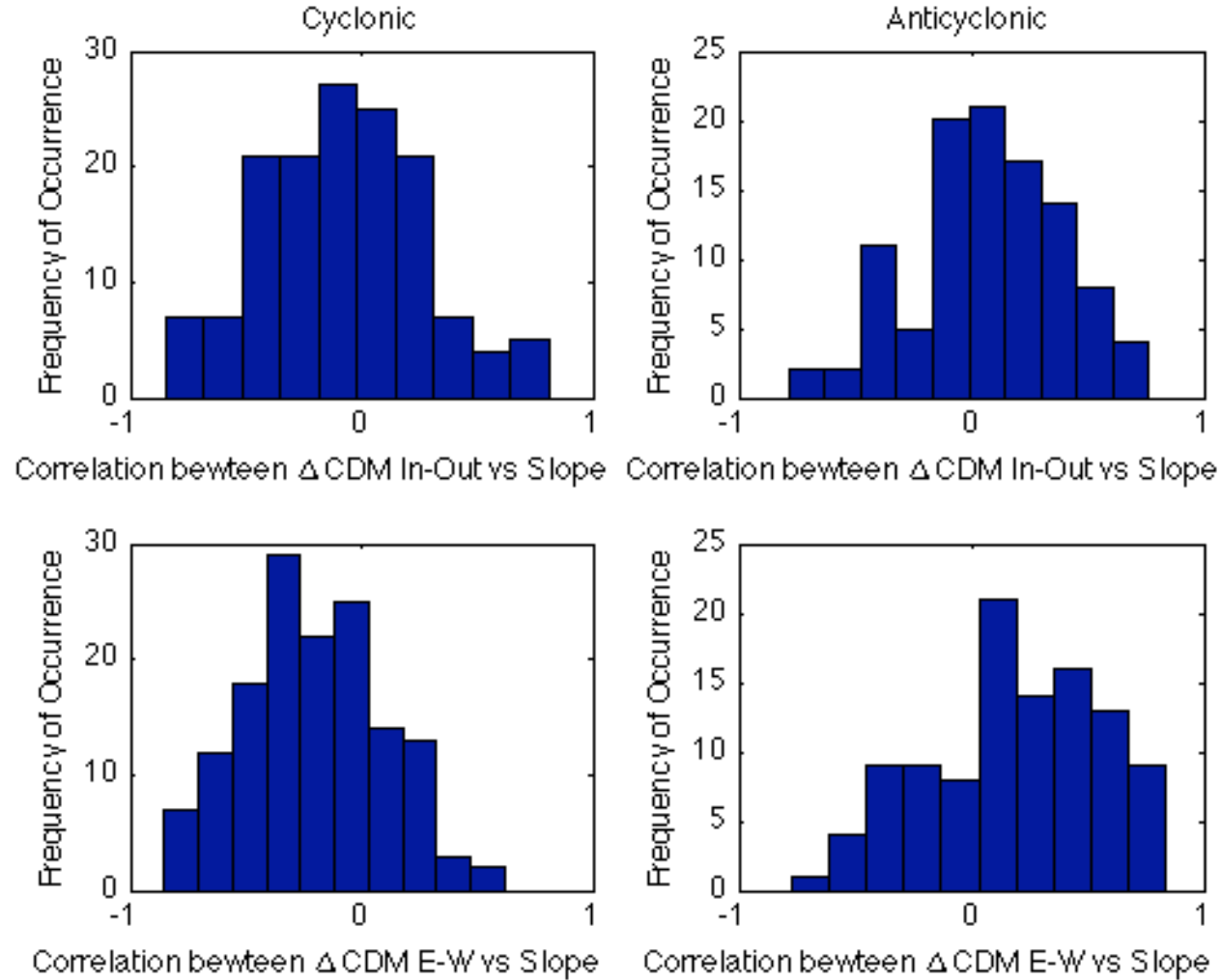


Figure S7: Histograms of the alongtrack correlation coefficients (r) for the the large scale meridional slope of the CDM distribution and the differences in the inside vs. outside Δ CDM (upper panels) and the differences in the east vs. west Δ CDM (signal lower panels) for all cyclonic (left panels) and anticyclonic (right panels) eddies. Only track lengths longer or equal to 15 weeks are used.