

Supplementary Material

Characteristics of Eulerian Mesoscale Eddies in the Gulf of Mexico

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1 Supplementary Figures and Tables

1.1 Supplementary Figures



Figure S1. Loop Current Eddy (LCE) percentage relative to the total generated eddies from January to December during 1993-2019. The black lines represent the monthly climatology of the Loop Current (LC) position.



Figure S2. Loop Current Frontal Eddy (LCFE) percentage relative to the total generated eddies from January to December during 1993-2019. The black lines represent the monthly climatology of the Loop Current (LC) position.



Figure S3. Non-LCE anticyclonic eddy (AE) percentage relative to the total generated eddies from January to December during 1993-2019. The magenta lines represent the monthly climatology of current speed gradient.



Figure S4. Non-LCFE cyclonic eddy (CE) percentage relative to the total generated eddies from January to December during 1993-2019. The magenta lines represent the monthly climatology of current speed gradient.



Figure S5. Current speeds (m/s, color shading) climatology and mean current direction (arrows) from January to December during 1993-2019. The magenta contour denotes the current speed of 0.2 m/s.

1.2 Supplementary Tables

Table S1. Eddy number and area found from 1993-2019 in three eddy detection algorithms developed by Faghmous et al. (2015), Le Vu et al. (2018), and Halo et al. (2014) that are referred to as F15, L18 and H14, respectively. Unfiltered absolute dynamic topography (ADT) is from delayed time 2018 (DT2018) gridded data from two altimeter satellites. Filtered ADT is obtained by high-pass filtering the ADT data with a two-dimensional spatial filter with a cut-off wavelength of 1000 km. AE and CE represent anticyclonic eddy and cyclonic eddy, respectively.

	F15	L18	H14
AE number (Filtered ADT)	67016	65852	55309
CE number (Filtered ADT)	93054	93118	86077
AE area (km ²) (Filtered ADT)	1.91e5	2.42e5	9.57e4
CE area (km ²) (Filtered ADT)	2.1e5	2.45e5	1.14e5
Total eddy number (Filtered ADT)	158970	160070	141386
Total eddy number (Unfiltered ADT)	139867	148309	125886

Table S2. Number of four types of eddy trajectory from 1993-2019. LCE and LCFE represent Loop Current Eddy and Loop Current Frontal Eddy, respectively.

	LCE	LCFE	Non-LCE AE	Non-LCFE CE
Number of eddy trajectory	51	297	376	447