

Accurately forecasting eddy propagation is a major challenge, requiring one not only to consider the classes of response to atmospheric forcing, but to also consider the relative impact of atmospheric forcing, updated boundary data and different ocean data types. The article of “A simple predictive model for the eddy propagation trajectory in the South China Sea” tries to build a predictive model using multiple linear regression to predict the positions of long-lifetime eddy tracks in the SCS. Here, I have some concerns about the reliability and applicability of the model:

1. As presented here the MCC method, although more objective, still includes the assumption that displacements are translational. It should be acknowledged that Kamachi (1989) modified the MCC to include rotational effects. Deformational effects should also be discussed. The dependence of the predictive trajectory on the parameters used also needs to be explained clearly.
2. As the core novelty in this study, the regression equations need to be clearly presented. This is important for other users or readers to independently validate or to further improve the method in real conditions.
3. In discussing the eight predictors (Lines 211-13): “The synoptic predictors contribute less to the forecast equations comparing with persistence and climatology”. Does it mean that the forecast mostly depends on the persistent inputs and climatology? And then, are the U_{clim} and V_{clim} derived from the MCC method and the history trajectories from 1992-2013? Please clarify.
4. Another point is the accounting for the β effect (Lines:198-200) in the predictors (U_{clim} , V_{clim}). The associated figure and illustration verified the importance of the effect, but how to modify the predictors is not clear. Please comment.
5. The current predictive model needs full independent validation. Page 4 Line 82-84: “To forecast the eddy trajectory 1-4 weeks in advance using the last position of the eddy, only eddies with a lifetime of 5 weeks or longer are retained in this study”. It clearly shows the eddy tracks in 2009-2013 used for evaluation here have been artificially filtered, and together with the above point 3 I think the model limit is only used for long-life eddy and the current results can be regarded as hindcast rather than prediction. So I suggest the authors consider using the current regression model to validate the new trajectories after 2013.

Other specific comments:

- 1) Before applying the MCC analysis to the images prepared, certain parameters describing the statistical method need to be set, like subwindow size, search window size as well as cross-correlation coefficient. Can you comment on their impacts, and their settings?
- 2) Here all SLA data and eddy dataset have a time resolution of 7 days. In fact, the new version based on the [DT-2014 daily "two-sat merged" sea level anomaly \(MSLA\) fields](#) (formerly referred to as the REF dataset) posted online by AVISO for the 22-year period January 1993–April 2015. So using the daily dataset could be more interesting, and some new knowledge can be expected.
- 3) Chen et al. (2011) also find that “Eddy propagation in the western basin to the east of Vietnam is quite random, with no uniform propagate direction”. Do you find a southern limit to the the trajectory predictive model?
- 4) The right hand panels of Fig. 2 (c, f) showing differences should keep the NaN areas as in (a) and (d).
- 5) Page 9, Line 217: “there are a total of 8 regression equations”? Could you provide the equations, to clearly distinguish the explanatory variables, response variables, and input regression data sources?
- 6) Figure 5 only shows one trajectory. Could you show all trajectories in the SCS during the time periods in question, in order to more thoroughly test the credibility of this method?
- 7) The predictive equation should be explicitly presented in the text. Although the effects of planetary β and mean flow advection are highlighted many times, the quantitative effect on the inputs or the predictive equations still are not clear.
- 8) Page 5, Line 99: Have the cross-correlations been normalized by the variances of the two time series?
- 9) Page 6, Figure 2 only shows the region north of 12°N. Does it mean this study only investigates the eddy tracks in the northern SCS? If so, relevant statements, and the title, should be qualified as pertaining to the northern SCS.
- 10) Page 9 Line 198: Are the climatological eddy motions divided into 12 months or only annual mean?

11) The eddy forecast error has been discussed by Hurlburt et al. (2008). Comment upon this previous evaluation would be valuable.

E. Hurlburt, Harley & Chassignet, Eric & A. Cummings, James & Birol Kara, A & Metzger, E & F. Shriver, Jay & Smedstad, Ole & J. Wallcraft, Alan & N. Barron, Charlie. (2008). Eddy-Resolving Global Ocean Prediction. Washington DC American Geophysical Union Geophysical Monograph Series. 353-381. 10.1029/177GM21.

Table 2: Eddy center location errors in ocean prediction models compared to ocean color from SeaWiFS in the northwestern Arabian Sea and Gulf of Oman

Ocean Color Eddy ID#	A or C	Ocean Color Eddy Center Location		1/16° NLOM	1/32° NLOM	1/8° NCOM	1/12° HYCOM	1/32° NLOMn No Assim
		°N	°E	Eddy Center Position Error, km				
1	C	23.55	60.2	35	18	80	48	NP
2	A	18.3	62.0	103	28	66	48	NP
3	A	21.15	60.25	44	58	48	37	NP
4	C	19.65	60.4	43	12	15	59	45
5	C	16.8	55.65	35	42	75	72	31
6	C	17.0	58.9	42	17	38	68	NP
7	C	16.7	57.9	53	79	NP	97	NP
8	A	18.0	57.6	NP	40	36	68	NP
9	C	25.1	57.6	NP	39	91	76	NP
10	A	24.7	62.5	30	35	NP	NP	NP
11	C	23.7	62.3	*	22	37	52	42
12	C	19.3	58.8	30	30	50	65	NP
13	A	19.225	59.35	35	11	NP	26	NP
14	A	25.3	58.55	36	33	NP	28	30
15	C	24.1	61.75	55	NP	NP	NP	47
16	C	22.25	62.7	14	*	NP	48	*
17	C	23.1	62.55	NP	13	NP	44	NP
18	A	22.5	62.85	18	51	47	NP	44
19	C	22.05	62.05	NP	23	NP	NP	26
20	C	22.2	59.95	NP	12	NP	22	NP
% of Eddies Present in the Model								
All eddies				70	90	55	80	35
Large eddies, 1–10				80	100	80	90	20
Small eddies, 11–20				60	80	30	70	50
Median Eddy Center Position Error, km								
All eddies				35.5	29	48	50	42
Large eddies				42.5	37	57	68	38
Small eddies				32.5	22.5	47	44	42
% of eddies With Most Accurate Position								
All eddies				22.5	52.5	5	10	10
Large eddies				20	50	10	10	10
Small eddies				25	55	0	10	10

12) In this study, the distance errors are presented by degree or km only. The relative error, relative to the eddy radius, is more important to directly understand the uncertainty.