**Ocean Science
Discussions**

Interactive comment on "Operational coastal ocean forecasting in the Eastern Mediterranean: implementation and evaluation" *by* G. Zodiatis et al.

G. Zodiatis et al.

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We thank the reviewer for their comments and suggestions and will attempt to address them here.

We do not want to exaggerate agreement between satellite-derived SST and CYCOM. On p408 we state for January 2005, the two have many similarities and list them. The rest of the page describes the disagreement in the southwest (not west). On p409, we state there is qualitative agreement in Sept 2004 and list the main features. The rest of the section discusses the difference southwest of Cyprus and between ALERMO and CYCOM along the coast, and presents the RMS and bias differences. If we repeatedly imply "very good overall agreement" it is not intended. We will attempt to tone down

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any exaggerating, and will accept suggestions on how to do so.

The XBT section (Limassol-Alexandria) is quite relevant as it passes through the position of the simulated cold tongue (SW of Cyprus). It may not be the location of maximum deviation, but it is obvious that the transect crosses a region of difference in SST between model and data.

"Why the differences between the two models and models-data? Are some coastal dynamics present in CYCOM but not ALERMO?"-We don't believe there are any fundamental differences in the dynamics present in each model, except that the higher resolution obviously allows for finer scales of variability in model variables and topography. "Does the higher resolution affect coastal topography?"-yes, min depth in CYCOM is 20 m not 25 m as in ALERMO. Topography originates from the same data set, but ALERMO uses an interpolated version (sub-sampled), while CYCOM uses a smoothed version. This means that certain coastal features not resolved by ALERMO are present in CYCOM. Spurious velocities into the coast can result after downscaling, leading to generation of surface gravity waves and generally poor model solutions after model initialisation. This is clearly minimized by the use of VIFOP. "Do the atmospheric fluxes have a different effect in the 2 models?"-We have not examined this, but both models use the same bulk parameterization formulas and meteorological forcing.

We do not want to take the ALERMO model fields as truth. We do not state that ALERMO is closer to reality. It is well known that downscaling a coarse resolution model and initialising a high resolution with the result introduces errors, and we want to point out how we have minimized those errors. To examine the possible errors, we have to compare the two models. Perhaps we need to emphasize this. From p405 to middle of p408, we compare the two models. For the remaining 4.5 pages of the results, there is only one reference to ALERMO (related to SST data) and the rest is CYCOM-data comparison. It seems to us that a strong emphasis has already been placed on comparison with data.

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We agree that we need to elaborate a bit on what we gain by using CYCOM. For example, we can describe how the model output is used for oil spill fate predictions. It has been shown in the MFSTEP project that the higher resolution model produces much better predictions, especially in coastal areas. After the recent spill of oil into the Lebanese coastal area, the CYCOM data were used with SKIRON data to successfully predict the slick track and position.

The ALERMO section should be removed, following suggestion of the reviewer, with essential details of ALERMO and SKIRON redistributed. This will clear up many issues.

Table 1 shows that the mean difference between model and data for 28 days of free running does not drift: there is no significant trend in the mean difference of the model-data fields. Perhaps we should replace "drift" with "divergence." While there is no drift in domain-averaged SST, it is clear that there are localized areas with large model-data differences. One possible reason for this is the 6-hourly SST averages used (24 hours for ALERMO) in comparing with remote sensing instantaneous images. Also, the ALERMO slave runs are initialized from the MFSTEP basin model, which uses surface heat flux corrections based on weekly composite SST fields (much smoother than the instantaneous fields shown here). It is still true that the localized features need to be better simulated, but to do that well, assimilation of instantaneous SST observations or other fields would have to be done every few days (or more frequently). The physical system is too complex to expect accurate predictions of individual plumes after a week of free running, even if initial fields represented reality exactly.

Fig. 1: Will be modified to be more clear, following the reviewer's request.

Fig. 9: It is not possible to use the same color scales for the entire month and still see features clearly. We have chosen a scale that works for all images except the two remote-sensing SST (3, 8 September), which require a scale 1 deg warmer than all the others to compare features. The new figure will be in the revised paper.

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Interactive comment on Ocean Sci. Discuss., 3, 397, 2006.

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