

Interactive comment on “A nested circulation model for the North Aegean Sea” by V. H. Kourafalou and K. P. Tsiaras

Anonymous Referee #2

Received and published: 18 July 2006

A nested circulation model for the North Aegean Sea

General comments: This paper adequately describes a modelling project which is clearly part of a larger collaborative project. In my opinion the scientific results are not sufficiently novel or insightful to warrant publication in their current form. The work reads like an interim project report and the scientific investigations are not presented with sufficient rigour or clarity. The authors, themselves, state:

"It was rather an academic exercise intended to examine if the nested model could spin up from rest and be able to achieve circulation features present on the longer running larger scale model (with additional features due to the higher grid resolution) after a short (one month) period."

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

The fact that the model setup achieves this is not sufficient grounds for publication without addressing the scientific issues that arise. For example: What happens to the finer features at the nested boundary given the one way nature of the nesting? Do any of the finer features actually influence water mass properties in the entire Aegean Sea? This is impossible to address with one-way nesting but, since the authors state the possibility as an important finding, it is frustrating that a deeper analysis is not attempted. In this respect, the lack of any comparison with observational data (however sparse) is a serious weakness. The authors need to identify some observed features of the circulation which are not present in the outer models. The work also needs a more structured approach to separate the effects of the improved topographic representation from those of the increased resolution.

Specific comments:

Model setup: Given the emphasis on the role of topographic features, there should be some discussion as to whether or not DBDB1 is adequate for this purpose. Local knowledge of key straits and sills in this area is likely to be superior and the authors should demonstrate that DBDB1 adequately matches independent soundings. Figure 1 is insufficient for this purpose.

River discharge appears to be treated inconsistently with a mixture of climatological annual means and values from a fixed observing period (1998?) for the Thermaikos Bay (labelled Thermaikos Gulf in fig.1). The imposition of a simple seasonal cycle on the BSW also seems at odds with the high frequency atmospheric forcing and the particular, short simulation period chosen.

Nesting procedure: Well described but the readers shouldn't have to follow links to discover basic details of the three models. It should be clearly stated that NAS and MFSTEP-ALMERO are based on POM and MFSTEP-OGCM is based on OPA.

Initial conditions and forcing are well described but the choice of frequency for the open boundary conditions needs more discussion. Daily averages are at odds with the

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

hourly atmospheric surface conditions. Were other options investigated?

Model simulations: Comparing the results of the nested model with those of the outer model adds very little of value. Comments such as: "...the simulated buoyant plume can vary, due to subtle topographic details, the result of the different resolution and the minimum coastal depth." are undeniable but insubstantial without any systematic attempt to separate the effects. The work is fundamentally flawed without any reference to observations. There must be mooring data or satellite data available to help determine the significance of new features in the nested model.

Concluding remarks: The authors are honest about the problems associated with the work. I.e. lack of detail in river discharges and Dardanelles exchange. The conclusions are still speculative and although logical they are not proven by the work as presented.

Interactive comment on Ocean Sci. Discuss., 3, 343, 2006.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper