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Ocean Science
Discussions

Interactive comment on "Fate of river Tiber discharge investigated through numerical simulation and satellite monitoring" *by* R. Inghilesi et al.

R. Inghilesi et al.

roberto.inghilesi@isprambiente.it

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We are deeply in debt with the anonymous referee #1 for the comment posted on Ocean Sci. Discuss. about "Fate of river Tiber discharge investigated through numerical simulation and satellite monitoring". The general comments were all absolutely relevant to the matter and we found the many technical suggestions inspiring in order to improve the quality and readability of the manuscript. This is our preliminary reply to the principal points addressed.

general comments: 1. Why readers of the OS journal should be interested in local phenomena

The mixing of the Tiber river plume is a coastal process whose scale is local in summer but is sub-regional in winter, when the dimension of the coastal jet due to the Tiber, (with smaller contributions from the near Volturno, Arno and Ombrone rivers) covers a substantial fraction of the North-Eastern Tyrrhenian coast. Even in summer, when the dispersion process is more local in nature, the monitoring of the position of the river plume can indicate the presence of larger scale coastal processes like the occurrence of upwelling or downwelling. We will introduce the issue in the manuscript.

2. Figures on the same scale and indication of the key locations

The aim of the study was not only the strict comparison between the numerical model and satellite data, our intention was to apply two well-established methodologies to the monitoring of the river plume in the central/upper Tyrrhenian Sea in order to discuss the coastal processes associated with real climatic/seasonal forcing. Nevertheless, an agreement between numerical simulations and observations is a necessary condition in order to gain any real knowledge about the phenomena. In fact, numerical fields of salinity/currents were mapped on the whole Tyrrhenian Sea in order to show the agreement between the features of the ICE-POM regional circulation and those known from climatic studies, which is also necessary. But we agree that perhaps the two comparisons should be kept separate in order to facilitate a semi-quantitative comparison on the coastal scale. We will also make a special effort in order to improve the readability of the maps.

3. Metrics for comparisons

We will try to introduce some quantitative analysis.

Technical corrections:

Winds MFS/ICE-POM: we used daily MFS analysis and 3-h SIMM wind fields. It is not easy to discuss the comparison between the numerical daily wind field of MFS with the 3-hour numerical SIMM wind we used. We instead compared our simulated 3-h wind

field with the onshore and offshore in situ wind recordings. we will further discuss it.

ICE-POM plume (Oey) we will address the issue.

4. spin-up

Undoubtedly, a ten days spin-up is far too short a period to reach a stationary circulation starting from a zero velocity field or from some known climatic condition. But ICE-POM starts with the initial OPA-MFS current field which is already in equilibrium with the OPA density field (and, by the way, ICE-POM is kept close to OPA-MFS during all the simulation). This means that the unavoidable adjustment associated with the ICE-POM/OPA-MFS nesting is much weaker than what would have been if the fields were far from the geostrophic equilibrium.

Interactive comment on Ocean Sci. Discuss., 9, 1599, 2012.