

Interactive comment on “Development of Super-Ensemble techniques for ocean analyses: the Mediterranean Sea case” by Jenny Pistoia et al.

Anonymous Referee #1

Received and published: 23 May 2016

Overall assessment

The paper entitled “Development of Super-Ensemble techniques for ocean analyses: the Mediterranean Sea case” by J. Pistoia et al describes and compares several regression/super-ensemble techniques applied to ocean analyses in a Mediterranean case study.

Whilst the paper fits well within the scope of the journal, the claimed novel technique using EOFs has already been developed and applied in many different contexts (e.g. Shin and Krishnamurti et al 2003; Rixen et al – several papers; Vandenbulcke et al 2009).

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The paper would have offered greater prospects if applied to forecast data as is usually the case with super-ensemble techniques. Applying these methods to analyses raises also a major concern as to the independence of OI-SST reference data, as they may be assimilated in some of the ocean analyses. This may impact the overall interpretation and use of the conclusions. This should be discussed in detail in the paper. Another potential issue is the analyses production cycles which may not be synchronous and hence cause some aliasing in the regression.

The paper should investigate more in depth the sensitivity of the technique to learning periods, as results suggest that the learning might not have 'saturated' at 15 or even 35 days. This should be done in conjunction with the selection of the number of modes, which are chosen a priori but could be cross-validated together with the optimization of the learning period instead of picking subsets of models. Likewise, there is no justification for the selection of the 12km filtering radius. There is hence a risk that the sensitivity studies presented in this paper, which do not cover the whole matrix of possible mix of parameters actually miss the optimal combination.

One would wonder if the proposed combination of models also offers interesting 'skill' or properties below the sea surface.

Specific comments

- I would recommend presenting all methods together as anomalies to the reference - it would be interesting to look at the values of weights and see if there is any pattern emerging (model or regional specific for example) - references: add Mourre et al Ocean Dynamics, 2011; Lenartz et al , Ocean Sciences 2010; (and I believe several others from Rixen et al), etc

Other:

- page 1: add space before countries in author list - page 1, line 17, change parenthesis for reference to Pinardi et al - page 7, line 4: comma - page 7, line 22: 'Physisc' - page

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8, line 17: 'it's pretty closer'? - page 9, line 2: 'Let us consider to be dialy...'? - page 10, line 2: authors' initials - page 13, caption 'Physisc', 'the column listS' - fig 11: a similar plot should be produced for the anomaly correlation and bias

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., doi:10.5194/nhess-2016-46, 2016.

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