FORECAST VERIFICATION USING SKILL SCORES AND WAVELETS. APPLICATION TO A TWO-WAY NESTED PRIMITIVE EQUATION MODEL OF THE LIGURIAN SEA

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The verification of a forecast is an important part of a forecasting process. It allows to establish the quality of a model, and to make the pertinent improvements. The verification methodology may be designed to detect the errors contained in the model. The verification process consist in the comparison of the model results with a reference system (as sample climatology, or the output of a reference version of the model), in order to establish the accuracy and skill of the first one. The Anomaly Correlation Coefficient, the Brier Skill Score and the Root Mean Square Error are used in the present work to quantify the predictive skill.

The disadvantage of this kind of measures is its over simplification. They are very useful, since the comparison between the model and the reference system is reduced to a limited set of numbers to establish the error, but it also results in a great loss of information. The method presented here combines the skill score analysis with a more detailed study. The use of wavelet transforms is shown to be useful, because of their capacity to localize in time and frequency the analysed signal. The signal is decomposed at different spatial scales, where the skill score methods can be applied separately. The information obtained with this method is more detailed, and scales where the largest errors occur can be easily identified.

This combination of methods has been applied to a two-way nested primitive equation model of the Ligurian Sea. The scale decomposition allows to better understand the differences between the model and the observed field, to establish the weaknesses and strengths of the model, and to propose the possible improvements that can be done.