On improving the simulation of the mesoscale eddies in the Northern South China Sea in a regional ocean model using the conditional nonlinear optimal perturbation (CNOP) method

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The conditional nonlinear optimal perturbation (CNOP) method is applied in a regional ocean circulation model to study the sensitivity area associating with the largest error growth in simulating the mesoscacale eddies in the Northern South China Sea (NSCS). A set of observing system simulation experiments (OSSEs) is performed. Our preliminary results show that the sensitivity area corresponding to the mesoscale eddies in the NSCS can be effectively identified by the CNOP method. By reducing the errors in the initial condition of the ocean model, significant improvements in the simulation of the mesoscale eddies in the NSCS are obtained. This is the first time to apply the CNOP method in the predictability study for mesoscale eddies in the ocean, and it indicates that it is feasible to implement targeting observations to improving the mesoscale eddies in the NSCS using CNOP method.