The TOPAZ monitoring and prediction system

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Within the EC funded MERSEA integrated project and the previous DIADEM and
TOPAZ projects, an operational monitoring and prediction system has been developed
and run in real-time since January 2003. The system has been upgraded to the latest
version of the Hybrid Coordinate Ocean Model (HYCOM) and covers the Arctic and
Atlantic domains with a horizontal resolution between 20 and 40km. Nested models
with fine resolution (4-5km) cover the North Sea, the Gulf of Mexico and the Barents
Sea and run jointly in real-time to provide forecasts up to one month ahead to end-
users. HYCOM is coupled to a multicategory sea-ice model and a Carbon:Nitrogen
Regulated Ecosystem Model (REcoM) with carbon and nitrogen being decoupled. The
system is currently assimilating satellite observation of sea level anomaly, sea surface
temperature and ice concentrations. Assimilation of a composite ice drift product is
under development. The assimilation method used for all data types is the Ensemble
Kalman Filter (EnKF).

The presentation emphasizes the model validation methodology, and shows the benefit
of recent model developments on the system predictability. The applications of the
forecast products are also presented.