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Hydrographic changes in the Norwegian Sea in the 1986-1993 period: analysis of observations and simulations

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The variability of mean temperature and salinity in the 1986-1996 period was studied in various sub-regions of the GIN (Greenland-Iceland-Norwegian) Sea, with particular focus on the Atlantic Water (AW) Inflow region and the Iceland-Faroe-Shetland (IFS) gap. Both observations and model outputs were utilized for the analysis. The observations consisted of approximately 760 deep (to near bottom) CTDs and 100 XCTs. Model results are derived from the output of the 1/3 deg global POP model of Los Alamos. A new Levitus 1/4 deg monthly climatology was employed to derive correction factors for any non-overlapping CTD cast times and locations, as well as for evaluation of any warming trends. In the region 12W-4W, 60N-66N, both observations and simulations show a steady increase of the mean temperature, starting in late 1988; however, only the observations show a large warm anomaly in June of 1989. In the area 12.5W-15.0E, 60N-80N, the simulations show significantly lower temperatures occurring in 1991 (as measured against CTDs), but the years 1993-1996 are much warmer than the 1985-1989 period. A progression of the 1989 warm pulse is seen from the Atlantic Inflow Region to the Barents Sea over a 15 month period.