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Supplement of

A global eddy hindcast ocean simulation with OFES2

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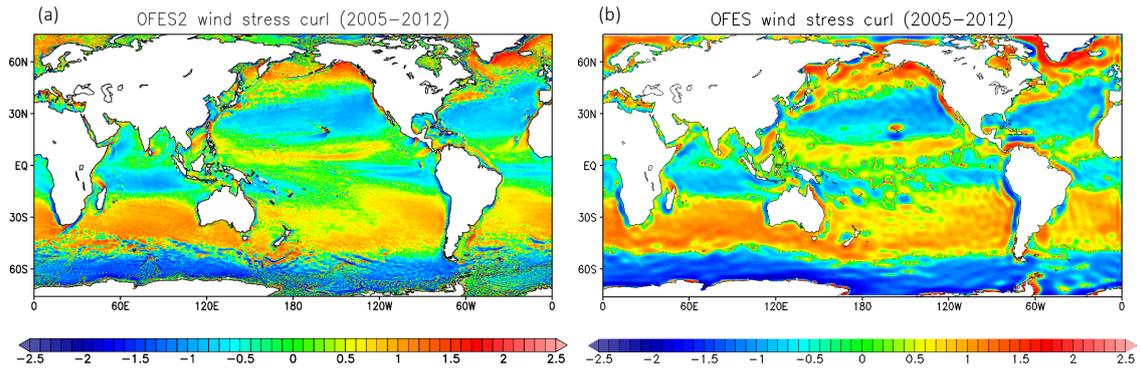
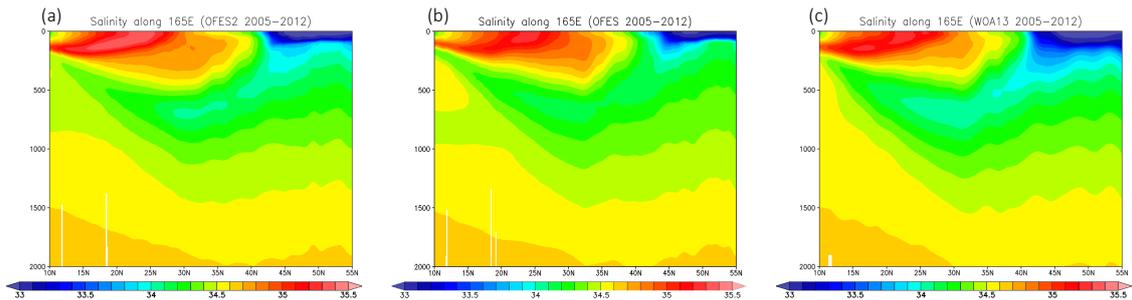
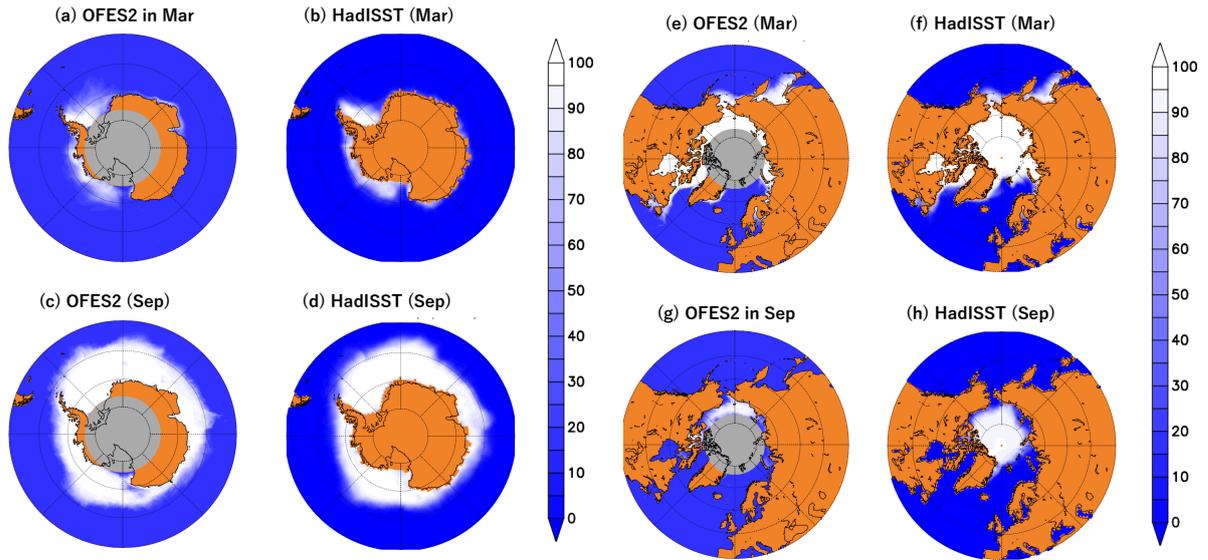


Figure S1: Mean surface wind stress curl in common logarithm scale (10^{-7} N m^{-3}) averaged over 2005-2012 in (a) OFES2 and (b) OFES forced by JRA55-do and NCEP reanalysis respectively.

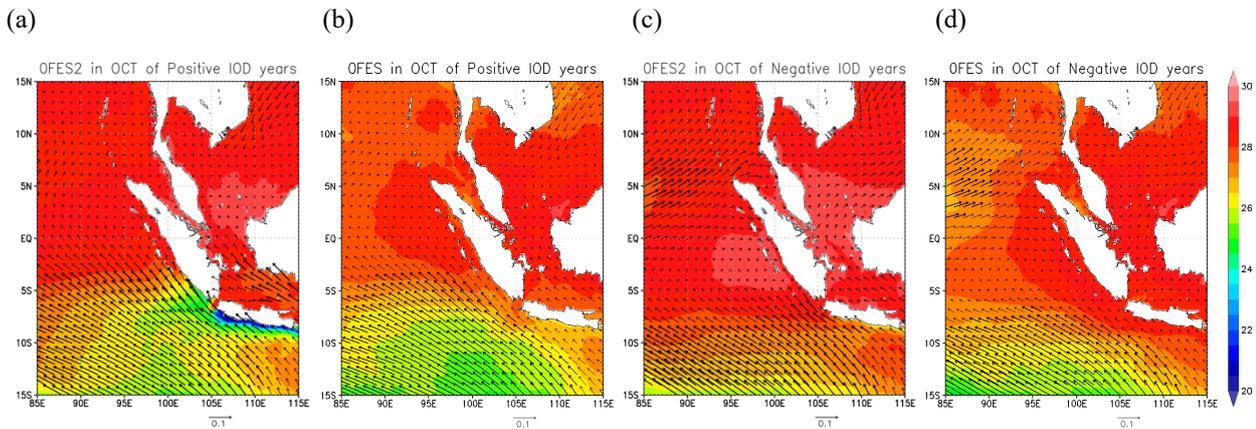
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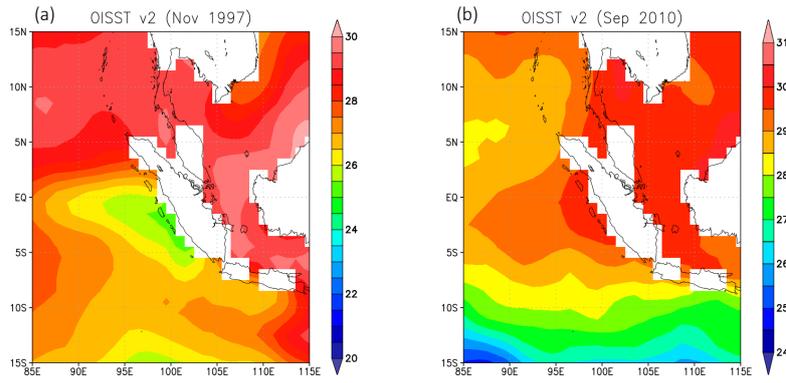
10 Figure S2: Meridional section of salinity (psu) along 165°E in the North Pacific in (a) OFES2, (b) OFES, and (c) WOA13 observations averaged over 2005-2012. The salinity distribution of the NPIW is slightly improved in OFES2 with the tidal mixing scheme compared with OFES.



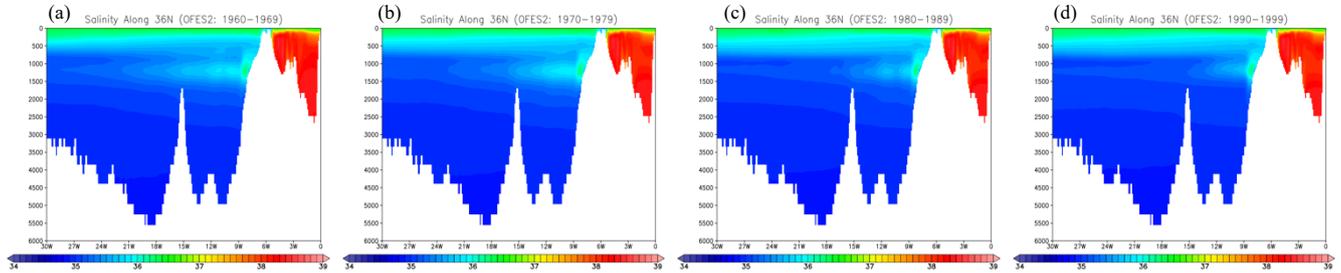
15 **Figure S3:** Same as Fig. 9, but in the 1980s.



20 **Figure S4:** Composite SST ($^{\circ}\text{C}$) in a region including the IOD eastern pole ($90^{\circ}\text{-}110^{\circ}\text{ E}$ and $10^{\circ}\text{ S-}0^{\circ}$) in October of (a) the positive IOD events in 1972, 1982, 1983, 1994, 1997, 2006, 2012, and 2015 and (c) the negative IOD events in 1974, 1981, 1989, 1992, 1996, 1998, 2010, 2014, and 2016 in OFES2. (b) and (d) are same as (a) and (c) but in OFES. The vectors are the surface wind stress (N m^{-2}), which are plotted at a $1^{\circ}\times 1^{\circ}$ resolution. The thick vectors denote wind stress magnitudes stronger than 0.05 N m^{-2} .



25 **Figure S5:** SST (°C) in the region including IOD eastern pole (90°-110°E and 10°S-0°) in mature month of (a) 1997 positive IOD event (Nov 1997) and (b) 2010 negative IOD event (in Sep 2010) based on OISST v2 (Reynolds 1988).



30 **Figure S6:** Vertical sections of mean salinity (psu) along 36° N in the eastern Atlantic Ocean in the (a) 1960s, (b) 1970s, (c) 1980s, and (d) 1990s in OFES2.

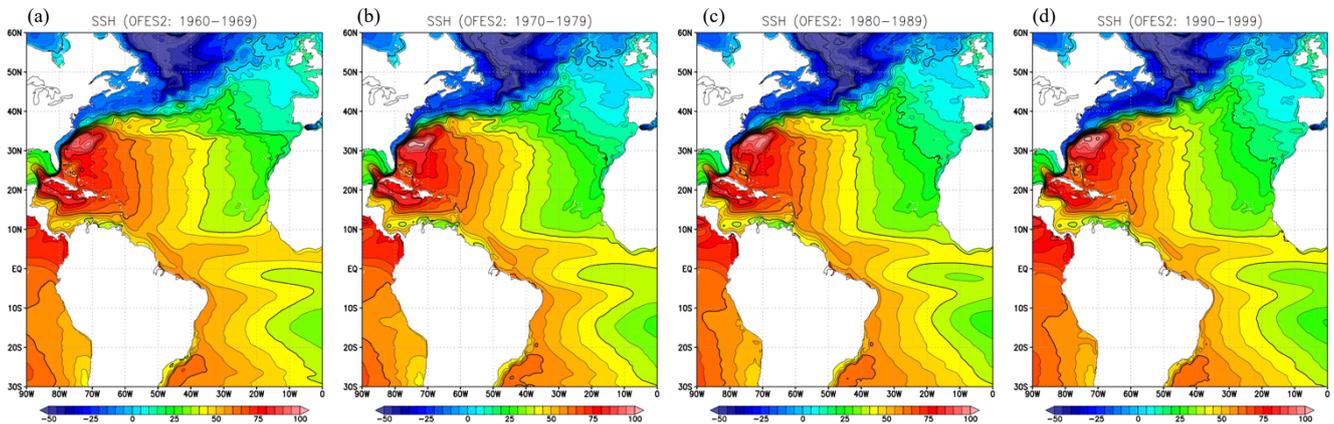


Figure S7: Mean SSH (cm) in the (a) 1960s, (b) 1970s, (c) 1980s, and (d) 1990s in OFES2.

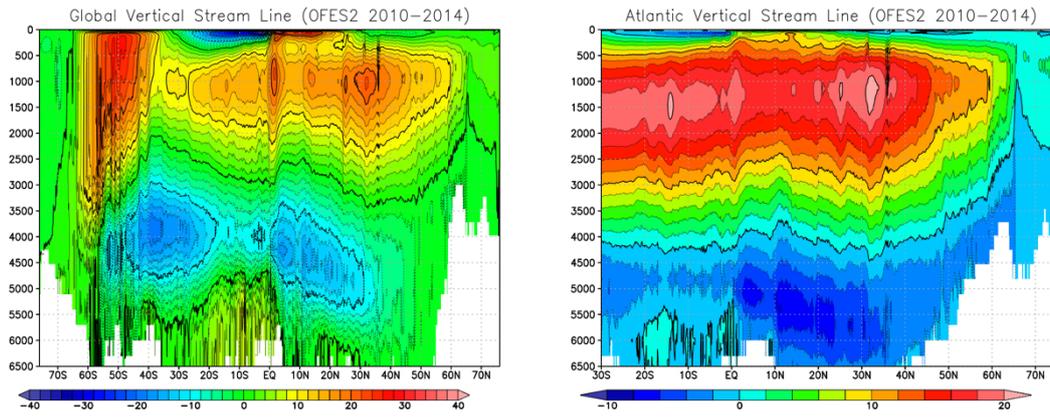


Figure S8: Zonal mean vertical stream function ($S_v = 10^6 \text{ m}^3 \text{ s}^{-1}$) for (a) Global and (b) Atlantic in OFES2 over 2010-2014.