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Title: Nonuniform warming of the North Atlantic from 1955-2012

Abstract: The North Atlantic (NA) is home to many diverse ecosystems, plays a pivotal role in the global thermohaline circulation, and harbors numerous economic resources. Many previous studies have focused on the NA and how it has transformed from the middle of the 20th century to the beginning of the 21st century. These studies primarily focus on fluctuations in ocean heat content (OHC) which is simply the amount of heat stored by the ocean. Our research builds on previous work by utilizing six decadal high-resolution climatologies that are based on in situ observations which allows diagnosing of temperature and OHC variations by examining two consecutive 30-year periods (1955-1984 and 1985-2012). We found that the warming within the NA is highly inhomogeneous, with most of the heating occurring near and just southeast of the Gulf Stream System and sustained cooling occurring in the western and central subpolar gyre. The higher-resolution climatologies reveal these changes in much greater detail than any other previous in situ-based study. Finally, the six decade analysis facilitates an investigation of possible relationships between OHC and different natural climate variability indexes, in particular - the Atlantic Multidecadal Oscillation, which exhibits noticeable correlations with OHC in the NA.