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Interannual to decadal changes in the salinity of the North Atlantic from in situ measurements

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Recent studies have shown significant regionally coherent linear trends in salinity in the upper 3000 meters of the North Atlantic over the last 45 years. Imposed on these linear trends are shorter time-scale fluctuations in the salinity of the North Atlantic,from internnual to decadal, which are also important for understanding earth's climate system. For example, recent work has looked at salinity changes on an interannual time scale for a limited number of years in the 1990s and found some correlation with the North Atlantic Oscillation (NAO). The present work examines changes in salinity on five-year (pentadal) time scales using in situ measurements. The source of data is the World Ocean Database (WOD). The method involves calculating mean salinity anomaly fields from monthly climatologies for each pentad (and for one year time periods where data allows) from 1955-59 to 2000-2004 for different standard isobaric levels. Different pentads or years are then compared to reveal patterns of change between the time periods. We also extend the time of study back to 1900 for sea surface salinity (SSS) using the ICES ship of opportunity SSS data set for the North Atlantic