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Variability of carbon fluxes across 24.5°N of the North Atlantic since 1992

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The Atlantic meriodinal overturning circulation (AMOC) carries warm upper waters north where they cool and sink before returning as cold deep water. The associated ocean-atmosphere heat flux is responsible for northwest Europe's mild climate. A transatlantic hydrographic section including carbon measurements has been occupied at 24.5° N in 1992, 1998, 2004 and 2010 allowing us to examine decadal changes in the circulation and fluxes of heat, salt and carbon. The net flux of inorganic carbon is southward, driven by the large atmosphere to ocean flux of carbon to the north, while net flux of anthropogenic carbon is northward a result of higher surface concentrations and lower deepwater concentrations. Most of the carbon flux variability in different years is determined by circulation variability. We compare carbon transports from four different transect occupations showing changes over almost two decades.