

## Reply to reviewer #2

**We would like to thank the reviewer #2 for his/her helpful minor comments, which we followed as can be seen below in bold.**

This paper serves as introductory paper for the GEOVIDE special issue and provides a summary of the scientific motivation and objectives for the cruise, as well as an overview of the major findings, presented in detail in the individual papers. The manuscript emphasizes the need for a combined analysis of the physical and biogeochemical processes (currents and water masses on one side, biological production, particle remineralization, particle adsorption/desorption, and fluxes from the atmosphere as well as from/to sediments on the other), and makes the point that the long history of previous OVIDE observations along the same track clearly benefits the interpretation of the present GEOVIDE data.

The manuscript is well written and provides a good context for the other papers. I recommend publication with only minor modifications, as described below.

Line 90f: This sentence is very general and can be hard to understand. Please provide examples for the “specific mechanisms”.

**We agree that this sentence is very general and four examples were given in the following sentence, with the associated TEIs. The cited mechanisms were atmospheric deposition, mixing rates of deep waters or shelf-to-open ocean, boundary exchange processes, downward flux of organic carbon and/or remineralisation in deep waters.**

Line 283: Please describe briefly, on what evidence the finding of “a weaker North Atlantic Current” is based on. I understand this is included in the Zunino, 2017 paper, but a short explanation will help readers.

**In order to help the readers in understanding the weaker NAC, the following sentence was added:**

**“The distribution of the volume transport in the three branches of the NAC (Figure 1) has changed: no transport was found in the northern branch, although 11 Sv were found in the mean of the previous decade, and the central branch, that marks the limit between the subpolar and the subtropical regions, nearly doubled in 2014.”**

Line 292ff: Please explain how the meridional heat transport can be “largest” despite the lower-than-average temperatures in and the weaker flow of (line 283) its main contributor, the North Atlantic Current. Also please explain how the MOC can be strong (line 293) when the NAC transport is relatively small.

**To make it clearer for the readers, the text has been modified as followed:**

**“Remarkably, despite the negative temperature anomalies in the surface waters, the heat transport across the OVIDE section estimated during GEOVIDE was the largest measured**

since 2002. This was attributed to the relatively strong MOC measured across the OVIDE section during GEOVIDE (Zunino et al., 2017) and, more particularly, to the strong transport of central water in the central and southern branch of the NAC (García-Ibáñez et al., 2018) that compensates the cold anomaly of the surface layer. The relatively strong MOC and heat transport were confirmed by Holliday et al. (2018) across a nearly simultaneous section (June-July 2014) between Labrador and Scotland.”

Typos:

line 184: achieve

**Done**

line 194: TEI

**Done**

line 210: have

**Done**