

EGU21-1953

<https://doi.org/10.5194/egusphere-egu21-1953>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Anthropogenic ocean acidification below the surface: does organic matter cycling result in enhanced vulnerability?

Siv K Lauvset and Nadine Goris

NORCE Norwegian Research Centre, NORCE Climate, Bergen, Norway (siv.lauvset@norceresearch.no)

Ocean acidification is a process driven by the ocean uptake of anthropogenic CO₂ emissions. Because this uptake happens at the ocean-atmosphere interphase, ocean acidification is presently foremost a surface ocean phenomenon. A recent study (Lauvset et al., 2020) shows that away from the surface ocean pH changes primarily due to organic matter remineralization, and in ocean depths between 500–1500 m this process enhances ocean acidification by on average $28 \pm 15\%$. Presently, this signal is very weak, and not detectable outside calculation uncertainties. However, as time passes the ocean overturning circulation will transport all carbon chemistry perturbations on and near the surface into the interior ocean, which can already be seen in the deep North Atlantic. Our hypothesis is that if CO₂ emissions, and thus ocean acidification, continue in the future then this remineralization enhancement will become significant and lead to some regions and habitats being more vulnerable to continued ocean acidification than others. Here we evaluate this enhancement over the 21st century using the Norwegian Earth System Model (NorESM), to assess which oceanic regions are made more vulnerable to future ocean acidification from this enhancement, and at what timescales the enhancement becomes important.