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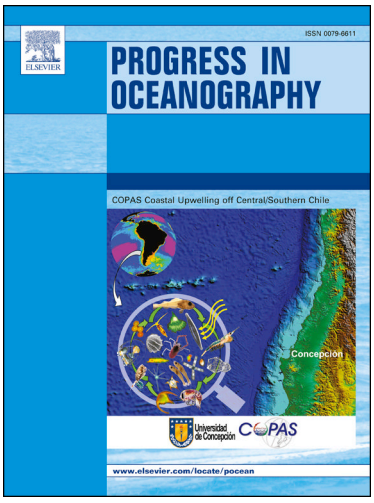

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Role of the circulation on the anthropogenic CO_2 inventory in the North-East Atlantic: a climatological analysis

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Keywords: Anthropogenic CO_2; Carbon storage; Air-sea CO_2 uptake; Water masses; Overturning; Gulf of Cadiz; North-East Atlantic

Highlights:

- North-East Atlantic climatology-based C_{ant} storage rate of 0.020 ± 0.003 Pg-C yr^{-1}
- C_{ant} import (43 ± 14 kmol s^{-1}) driven by the upper overturning circulation limb
- Net C_{ant} advection contributes to 60% of the C_{ant} storage rate
- Atmospheric C_{ant} uptake contributes to 40% of the C_{ant} storage rate
- 78 ± 30% of the annual air-sea CO_2 uptake is of anthropogenic nature (21 ± 10 kmol s^{-1})