A regional ensemble-based approach to design the future of the biogeochemical Argo array

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Within the frame of the EU-funded AtlantOS project, the design of the future of BGC-Argo array is addressed using a NEMO-PISCES probabilistic 60-members ensemble model simulation (Garnier et al. 2016) in an Observing System Simulation Experiments (OSSEs) framework (Germineaud et al. 2018). The goal is to identify recommendations or consolidate an integrated satellite/in situ biogeochemical observing system. One member of the ensemble is used as a Nature Run and observed by 9 synthetic observing system scenarios. Those scenarios differ in BGC-Argo density profiles and satellite ocean color coverage. Depending on the situation of the biogeochemical ocean state, the assimilation of those synthetic observations impacts in different ways the statistical properties of the ensemble. It appears that satellite observations are more efficient during weak biogeochemical events rather than during bloom periods, and on the opposite, BGC-Argo profiles seem more efficient during intense biogeochemical events.