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Quality controlling autonomously collected bio-optical data

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German research vessels collect vast amounts of valuable data of the marine environment during each expedition. Especially underway data from autonomous sensor systems that are not the main focus of the scientific program are often not published or published with unknown quality and non-standardized and incomplete meta data. The "Underway Research Data"project of the German Marine Research Alliance (DAM) aims to increase the vessel's efficiency to create quality-assured research data by establishing well-documented workflows from the ship's data acquisition to their open publication under FAIR principles (Findable, Accessible, Interoperable, Reusable). Here, we present the current workflow for bio-optical underway data, specifically chlorophyll-a fluorescence. In general, the workflow is structurally the same for different underway oceanographic parameters. But in detail, each parameter needs special attention, in case of bio-optical data, due to its high natural variability and the proxy-nature of the underlying measurement technique. We present challenges to robustly quality control the data and make suggestion on how to overcome these by a community effort, envisioning a future standardized database for calibration coefficients. As a future perspective, all autonomous platforms with the same sensor type, such as BGC-Argo floats, can profit from such a database.

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