Abstract 15. Addressing the timing and extension of phytoplankton bloom through the eastern Channel - southern North Sea continuum in spring: an automated approach.

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The eastern Channel and southern North Sea are continuously influenced by the Atlantic waters and freshwaters inputs, as well as by tidal fronts. At the French coast, brackish waters from estuaries are driven from the Channel to the North Sea by the residual tidal current creating a "coastal flow". It leads to a Region of Freshwater Influence (ROFI) that flows from the Bay of Seine to the Scheldt and Rhine estuaries, supplementing and maintaining a high nutrient concentration along the French, Belgian and Dutch coast.

During recent years, semi-automated techniques were applied in these areas at a high resolution to highlight spatial and temporal patterns in phytoplankton successions and outbursts. They provide rapid estimates of abundance and chlorophyll *a* content for the whole community, at the single-cell or colony level, from small picoeukaryotes up to large microphytoplankton.

The timing and extension of phytoplankton blooms was addressed during a series of three consecutive cruises in spring 2017 (PHYCO-CNRS cruise, Lifewatch-VLIZ cruise, Zirfaea-RWS cruise) in the frame of regular monitoring networks and the Joint European Research Infrastructure for Coastal Observation - New Expertise (JERICO-Next H2020) project. The cruises started after the onset of spring blooms in the eastern Channel and followed their extension along the eastern Channel towards the southern bight of the North Sea. A multi-spectral fluorometer and a pulse-shape recording flow cytometer were deployed for continuous and/or discrete sampling analysis. Both techniques highlighted patchiness and sharp variations in abundance and fluorescence per group with some inshore-offshore gradients and decreasing distance from estuaries. Multivariate analysis was used to reveal relations between nutrients and phytoplankton communities.