HARMFUL ALGAL BLOOM DETECTION

Application: To detect a possible algal bloom (of *L. Chlorophorum*) to anticipate its drifts into sensitive areas such as fish and shellfish farms.
Users: Operators and decision makers in the aquaculture sector.
Availability: Daily at 1km resolution.

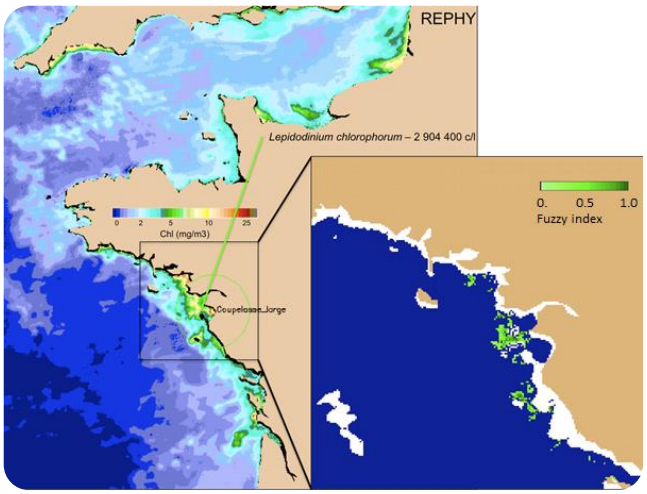

FIGURE 1:* L. chlorophorum *BLOOM DETECTED BY SAFI (28/03/2013) IN THE LOIRE PLUME FRANCE (LEFT) AND CHLOROPHYLL-A CONCENTRATION (RIGHT) ESTIMATED FROM SPACE

FIGURE 2: ALGAL BLOOMS POSE SERIOUS PROBLEMS TO AQUACULTURE, FISHERIES AND RECREATION SECTORS – PICTURED IS A* L. chlorophorum *BLOOM (PICTURE: PHENOMER)

Source data: MODIS (NASA) satellite reference, then Sentinel-3 (ESA) when available.

Methodology: The frequency and distribution of high biomass *L. chlorophorum* blooms were analysed over the French continental shelf from 1998-2012. Exploitation of Earth Observation in visible bands where the presence of *L. chlorophorum* bloom is confirmed have shown that this species has specific optical signature that allows distinction from other species. An algorithm has therefore been developed for *L. chlorophorum* blooms detection from satellite visible imagery (Jegou 2013, Sourisseau *et al.* 2016). To compute a map of the probability of actual presence of this algae, the optical characteristics of each water pixel are thus compared to the *L. chlorophorum* optical characteristics reference. The closer the characteristics, the highest the probability of detection.

Limitation: Detection is only possible for high biomass blooms.

This dataset is a good estimation of the presence of *Lepidodinium chlorophorum*. The available data in SAFI has been tuned up for the South Brittany and Biscay Bay. It has proven by the indicator's detection of an important Harmful Algal Bloom in the South of the Loire estuary in France in August 2013 (Figure 1 - almost 3.10^6 Cells/liters of *L. Chlorophorum* have been counted by REPHY network).

References: Sourisseau M; K. Jegou , M. Lunven , J. Quere, F. Gohin a , P. Bryere (2016). Distribution and dynamics of two Dinophyceae producing high biomass blooms over the French Atlantic Shelf. HARALG-1197.
Jegou K.(2013). Identification satellitaire des efflorescences de deux dinoflagellés, *Lepidodinium chlorophorum et Karenia mikimotoi*, grâce à leurs caractéristiques optiques.

The SAFI project receives funding from the European Commissions Seventh Framework Package (FP7 2007-2013) under grand agreement no. RI-607155. The views and opinions expresses in this publication are the sole responsibility of the author and do not necessarily reflect the views of the European Commission.

contact@safiservices.eu
www.safiservices.eu
@SAFIServicesEU