

Monitoring approaches for supporting offshore aquaculture management and EU Directives at Sagres, Portugal

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Abstract:

The increasing development of aquaculture activity in the coast of Sagres, area included in the Parque Natural do Sudoeste Alentejano e Costa Vicentina (PNSACV) SW Portugal, has to comply with regional and national regulations. The development also has to comply with EU directives including: Quality of Shellfish Waters Directive 2006/113/EC (QSWD); Water Framework Directive 2000/60/EC (WFD); Marine Strategy Framework Directive 2008/56/EC (MSFD); Maritime Spatial Planning 2014/89/EU, (MSP). During 2014/2015, a monitoring routine was established to assess the potential impact of aquaculture in the region, as required by the Agência Portuguesa do Ambiente (APA). This involved a weekly sampling routine of water parameters at surface and bottom, including temperature (SST), salinity (Sal), Secchi depth, chlorophyll (Chl), suspended particulate matter (SPM), pH, oxygen (O₂) and nutrients. Additional water samples were collected for phytoplankton counts to provide information on the species contributing to Harmful Algal Blooms (HABs). Associated with the routine sampling, innovative approaches to understanding the impact of aquaculture have been undertaken including: use of remote sensing products to provide spatial and temporal data for SST, Sal, Chl, and SPM validated with *in situ* radiometric data (Satlantic and WISP-3); genomics for HABs and flow cytometry for nanoplankton; a survey of impact on the benthos; determination of nutrient condition in the region through nutrient stoichiometry; automisation of data collection with an oceanographic buoy.

Preliminary data from both routine and innovative studies will be presented in relation to aquaculture management and to the requirements of the WFD and the MSFD.

Keywords: Monitoring, Offshore, Aquaculture, EU Directives