Satellite and *in situ* monitoring of marine coastal waters in the Ligurian and North Tyrrhenian seas within the MOMAR Project

C. Lapucci, C. Brandini, A. Ortolani , F. Maselli, L. Massi, F. Galgani, C. Nuccio, B. Gozzini

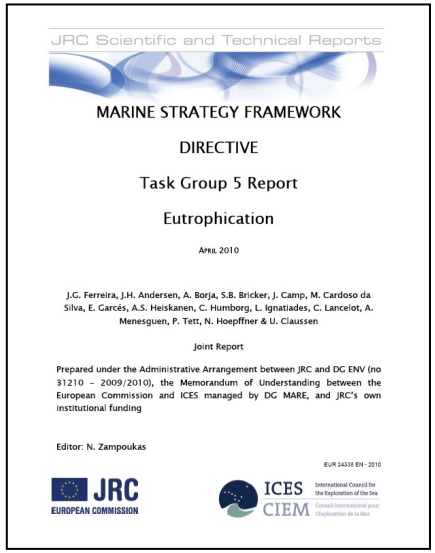
MELBA

MILONGA

MARITTIMO - IT FR - MARITIME
TOSCANA - LIGURIA - SARDEGNA - CORSE

UNIONE EUROPEA
UNION EUROPEENNE

Phytoplankton


JRC Scientific and Technical Reports

MARINE STRATEGY FRAMEWORK

DIRECTIVE

Task Group 5 Report

Eutrophication

APRIL 2010

J.G. Ferreira, J.H. Andersen, A. Borja, S.B. Bricker, J. Camp, M. Cardoso da Silva, E. Garcés, A.S. Heiskanen, C. Humborg, L. Ignatiades, C. Lancelot, A. Menesguen, P. Tett, N. Hoepffner & U. Claussen

Joint Report

Prepared under the Administrative Arrangement between JRC and DG ENV (no 31210 – 2009/2010), the Memorandum of Understanding between the European Commission and ICES managed by DG MARE, and JRC's own institutional funding

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EUR 24336 EN - 2010

JRC EUROPEAN COMMISSION

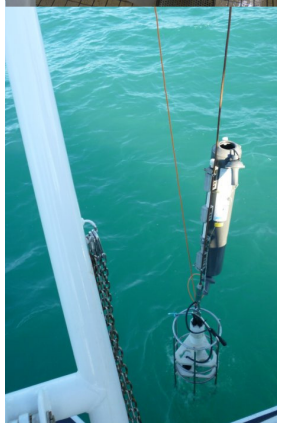
ICES CIEM

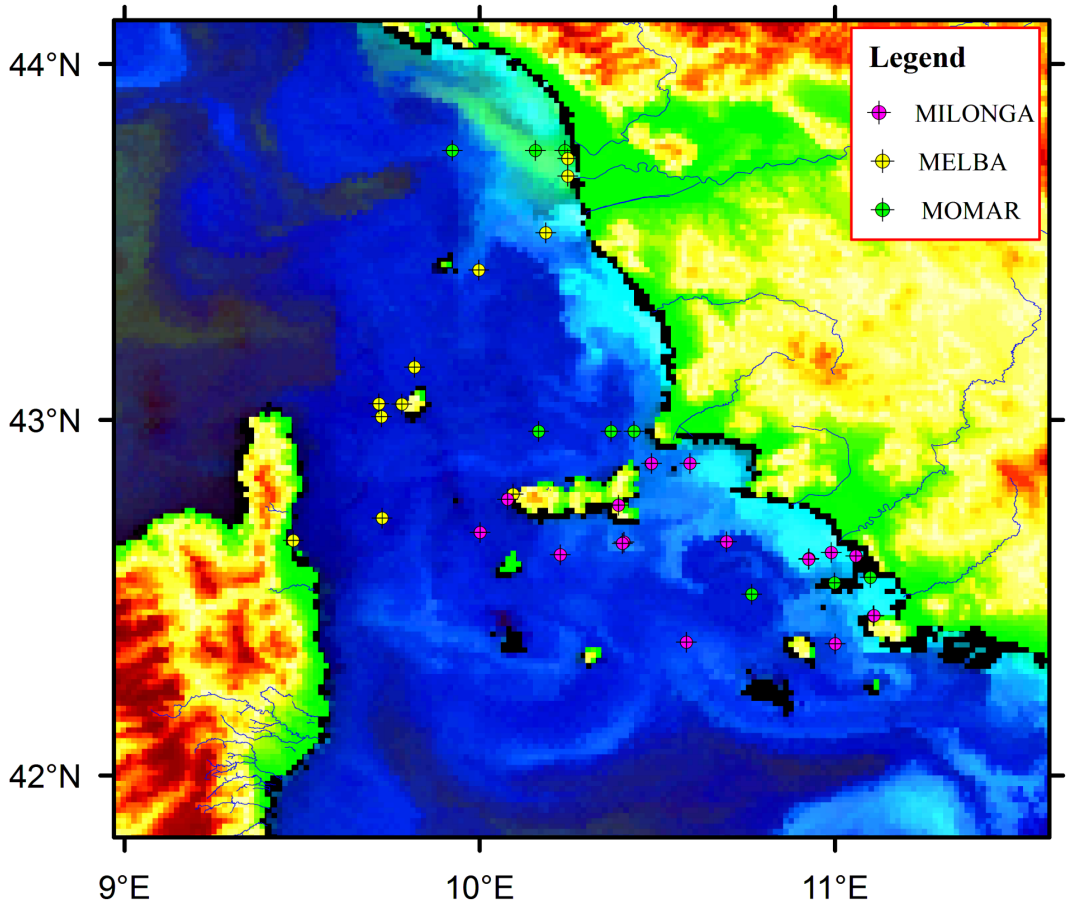
Since **chlorophyll_a** is the only photosynthetic pigment found in all phytoplankton, it gives an estimate of phytoplankton abundance - trophic state - and biomass - primary productivity.

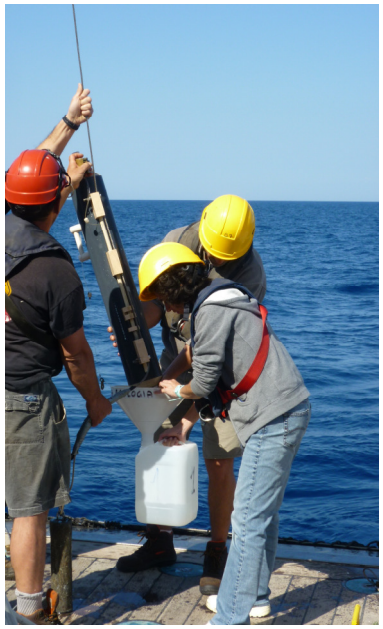
ENVIRONMENTAL CHARACTERIZATION

Chlorophyll_a is a key element to assess the sea ecological status (WFD, MS descriptor 5 - eutrophication)

OCEANOGRAPHIC CAMPAIGNS



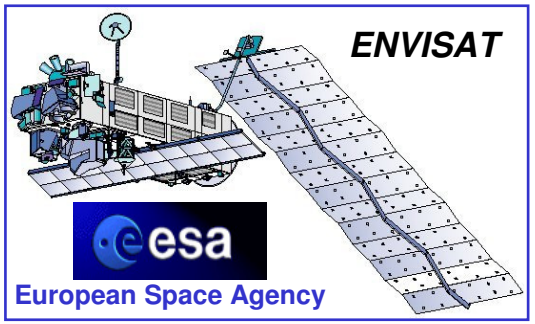




Ifremer; Università di Firenze Ecologia Vegetale CIBM

SATELLITES

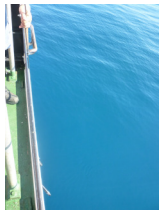
MODIS AQUA – TERRA NASA *MODerate Resolution Imaging Spectro-radiometer*
(Res. 1km)
(FUTURE: VIIRS NPP)



MERIS Envisat ESA
Medium Resolution Imaging Spectro-Radiometer
(Res. 1.2km 0.3km)
(FUTURE: OLCI Sentinel-3)

ALGORITHMS	Chlorophyll CDOM index – colored dissolved organic matter SS – suspended sediments

Case 1



Case 2

ALGORITHMS

OC3M

Bio optical empirical MODIS global algorithm, Case 1 waters.

O'Reilly, J.E., and 24 Coauthors, 2000: SeaWiFS Postlaunch Calibration and Validation Analyses, Part 3. NASA Tech. Memo. 2000-206892, Vol. 11, S.B. Hooker e E.R. Firestone, Ed. NASA Goddard Space Flight Center, 49 pp.

MedOC3

Bio optical empirical MODIS algorithm, OC3 regionally adapted on North Western Mediterranean, Case 1 waters.

Santoleri R., Volpe G., Marullo S., Buongiorno Nardelli B., "Open waters optical remote sensing of the Mediterranean Seas", Remote sensing of the European Seas, 103-116, Springer Netherlands, 2008.

OC5

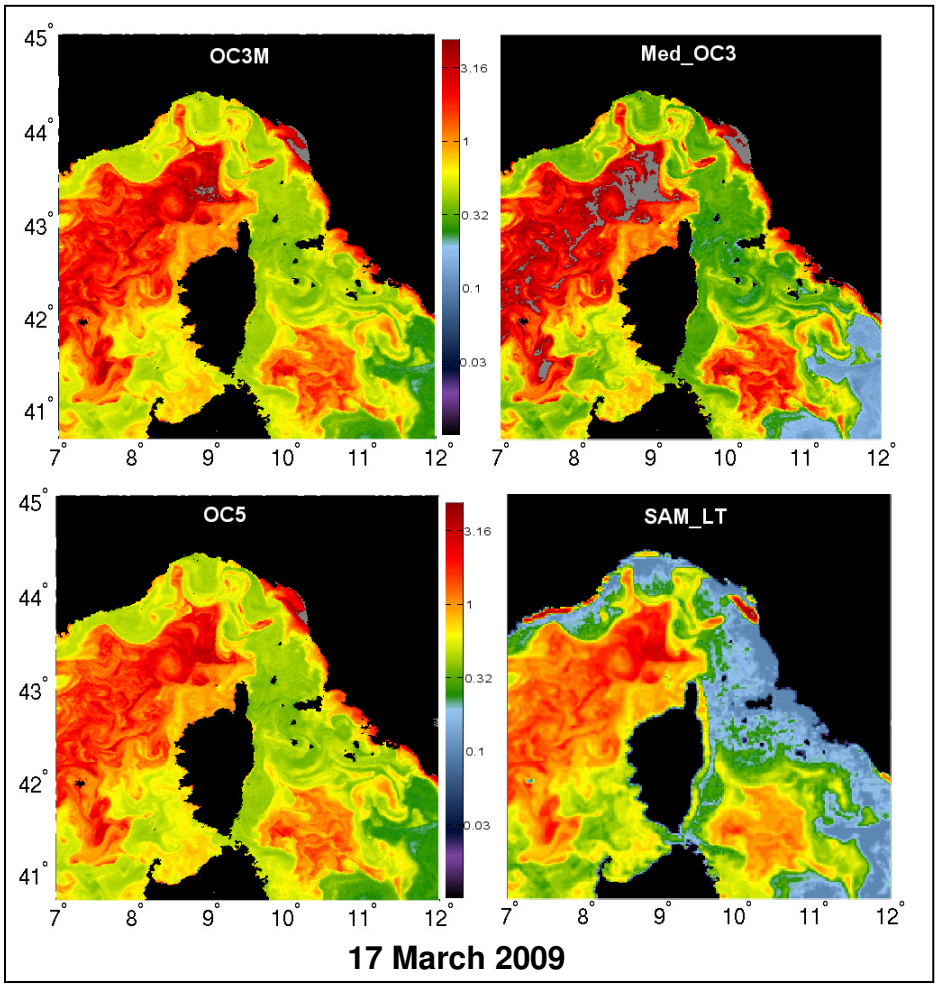
Bio optical empirical MODIS (MERIS and SeaWIFS) algorithm, suited for Biscay Bay and the English Channel, Case 1 and Case 2 waters.

Gohin F., Druon J. N., Lampert L., A five channel chlorophyll concentration algorithm applied to SeaWiFS data processed by SeaDAS in coastal watersInt. J. Remote Sensing, 2002, vol. 23, no. 8, 1639–1661.

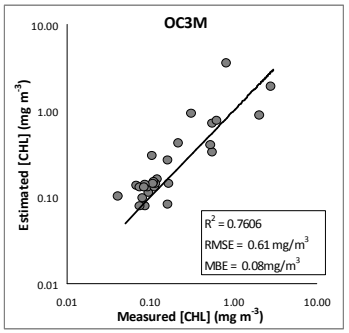
SAM-LT

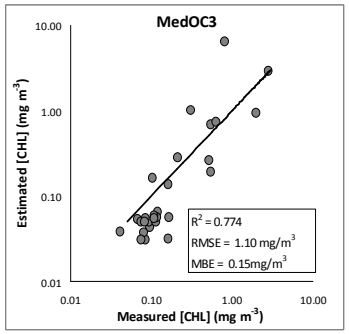
Bio optical semi – analytical MODIS algorithm, locally tuned for Tyrrhenian - Ligurian sea, Case 2 waters.

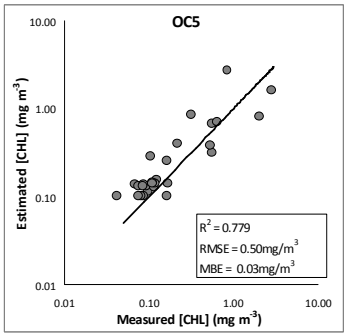
Maselli F., Massi L., Pieri M., and Santini C., Spectral Angle Minimization for the Retrieval of Optically Active Seawater Constituents from MODIS Data Photogrammetric Engineering & Remote Sensing, Vol. 75, No. 5, May 2009, pp. 595–605.

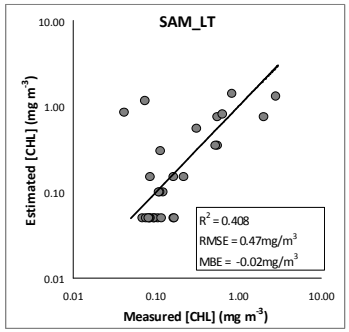


Campaign	Period	Number of stations	Institution
MOMAR	April 2010 July 2011	28	CIBM
MELBA	May 2011	11	LaMMA, Ifremer, CIBM
MILONGA	September October 2011	18	LaMMA, Ifremer, CIBM, ARPAT









Thank you

lapucci@lamma.rete.toscana.it