



**EUROPEAN COMMISSION**  
DIRECTORATE-GENERAL  
**Joint Research Centre**

# JRC CAL/VAL

**Giuseppe Zibordi**

in collaboration with

JRC-IES Marine Team  
and  
GSFC-AERONET Team

OCVC-Workshop, Ispra, October 20, 2010

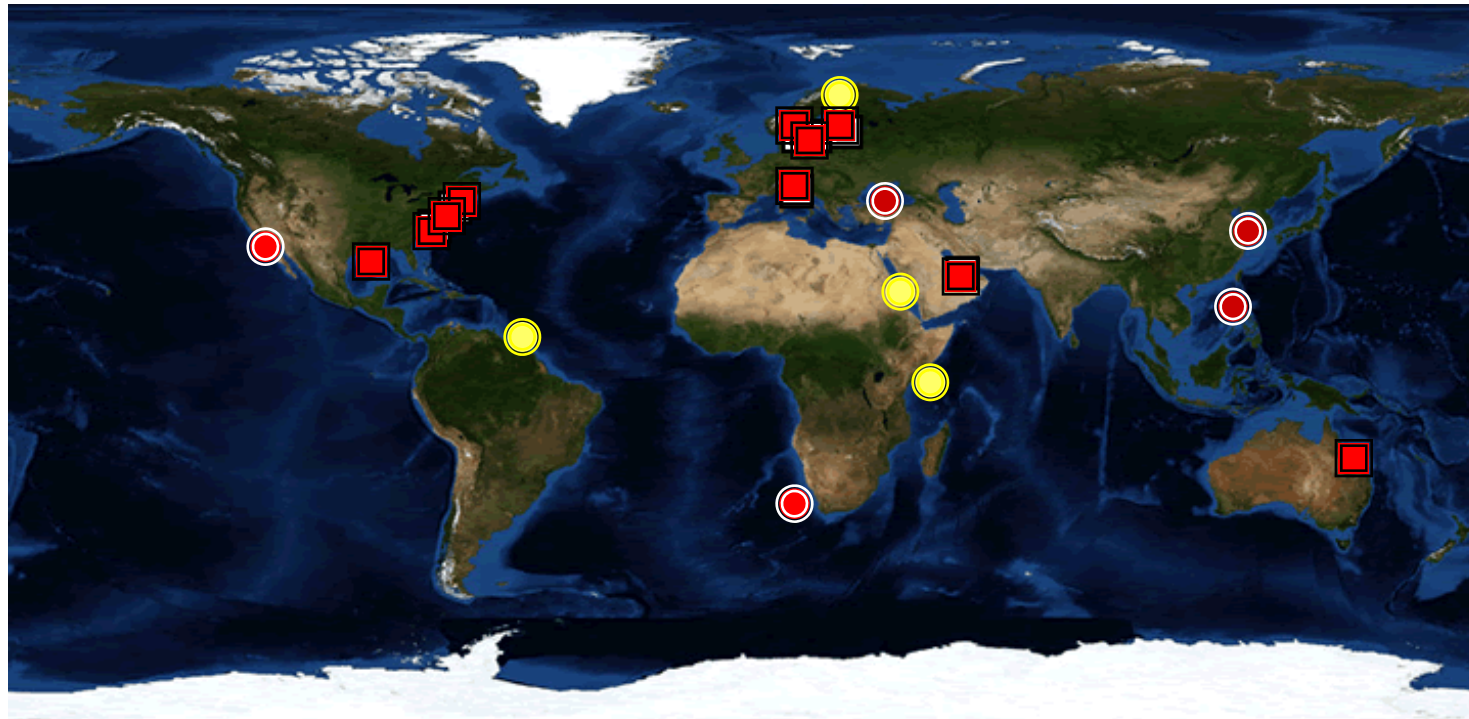


Reduction of uncertainties in current remote sensing coastal products requires:

- Methods to minimize uncertainties in atmospherically corrected data
- Basin specific bio-optical algorithms
- Techniques for the selective application of basin-specific algorithms on pixel by pixel basis

Progress in each direction would benefit from comprehensive, accurate and basin-representative measurements of the marine and (hopefully) atmospheric optical properties

# AERONET-OC (2002-present)



■ Current sites      ● Planned sites      ● Potential sites

## Current management and responsibilities

- **NASA** manages the network infrastructure (i.e., handles the instruments calibration and, data collection, processing and distribution within AERONET).
- **JRC** has the scientific responsibility of the processing algorithms and performs the quality assurance of data products.
- **PIs** are responsible for establishing and maintaining AERONET-OC sites.

# Deployment Requirements

## AERONET-OC



## AERONET



AERONET-OC sites identification, instrumentation and continuous operation is much more complicated and expensive than for AERONET. This puts natural limits to the number of operational sites

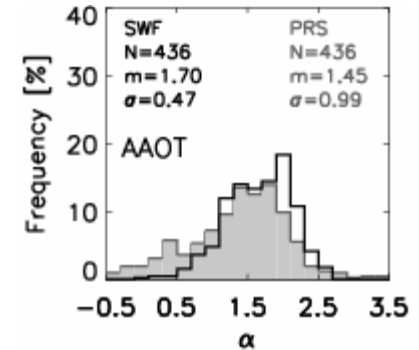
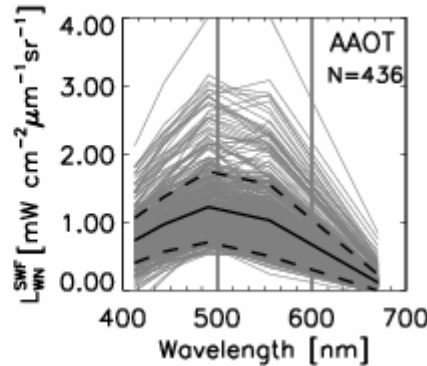
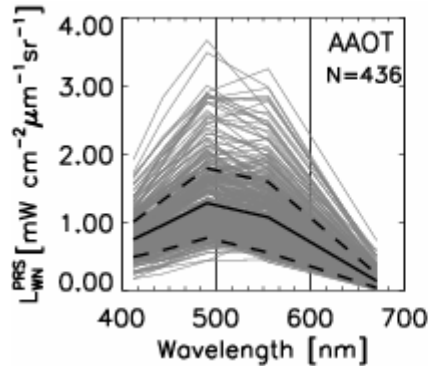
Products:  $\tau_a$ ,  $\alpha$ , ...

Products:  $L_{wn}$ ,  $\tau_a$ ,  $\alpha$ , ...

- Fixed deployment platforms to allow for accurate pointing
- Relatively deep waters to minimize bottom perturbations
- Selected deployment configurations to minimize superstructure perturbation
- Away from land to minimize adjacency effects in remote sensing data

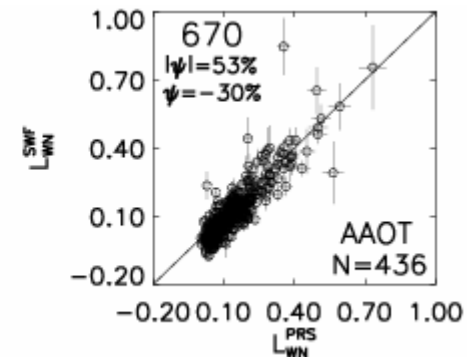
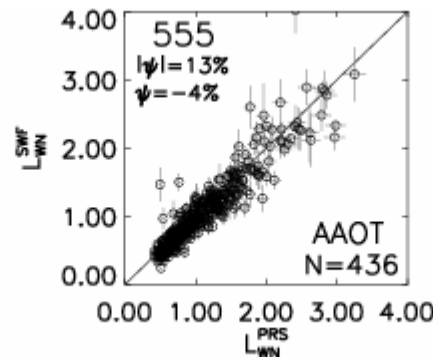
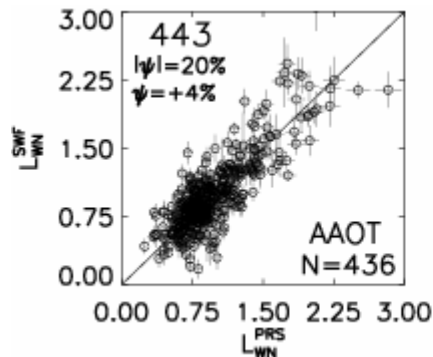


# Validation of Satellite Products (SeaWiFS)



*In situ* and satellite derived  $L_{WN}$  spectra

Ångström exponents



Satellite (MODIS) versus *in situ* (AERONET-OC)  $L_{WN}$  match-up analysis

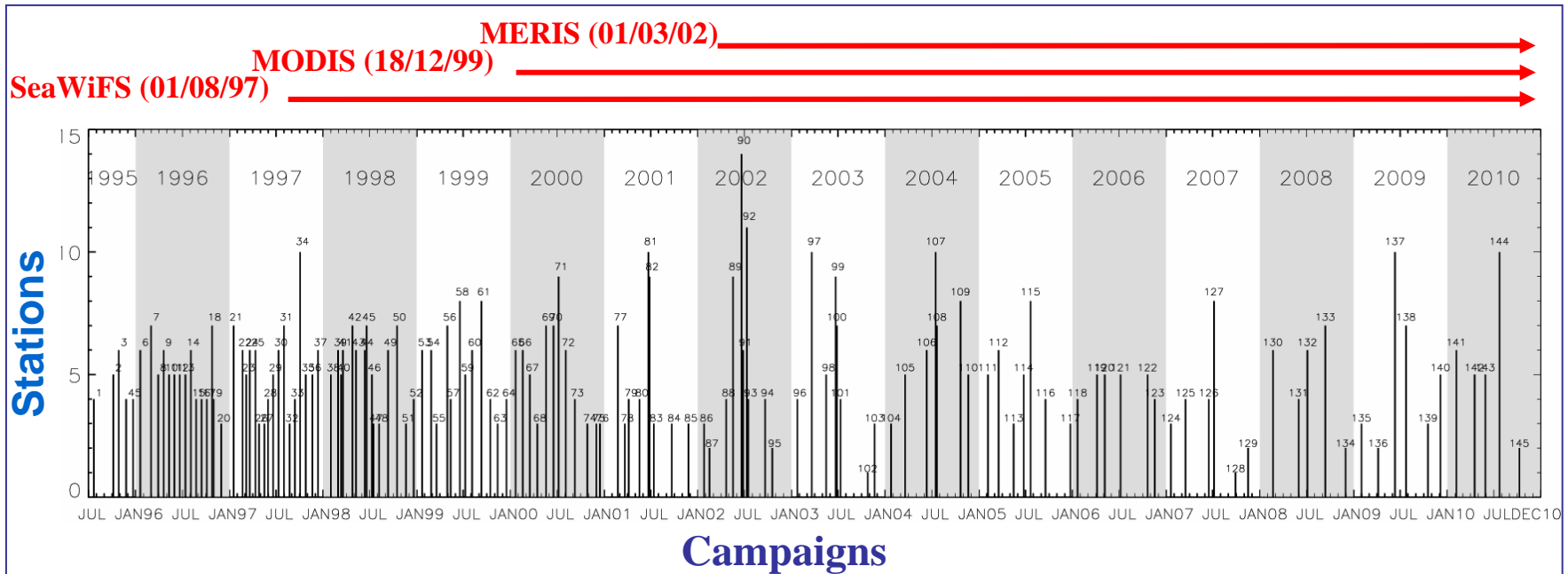
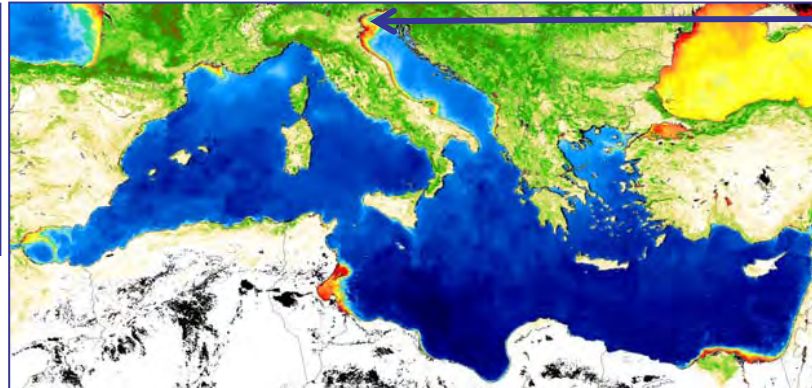
G.Zibordi, J.-F. Berthon, F. Melin, D.D'Alimonte and S. Kaitala. Validation of satellite ocean color primary products at optically complex coastal sites: northern Adriatic Sea, northern Baltic Proper and Gulf of Finland. *Remote Sensing of Environment*, in press, 2009



# CoASTS

AOPs and IOPs measurements performed applying identical and consolidated: technology, measurement and calibration protocols, processing codes and quality assurance criteria.

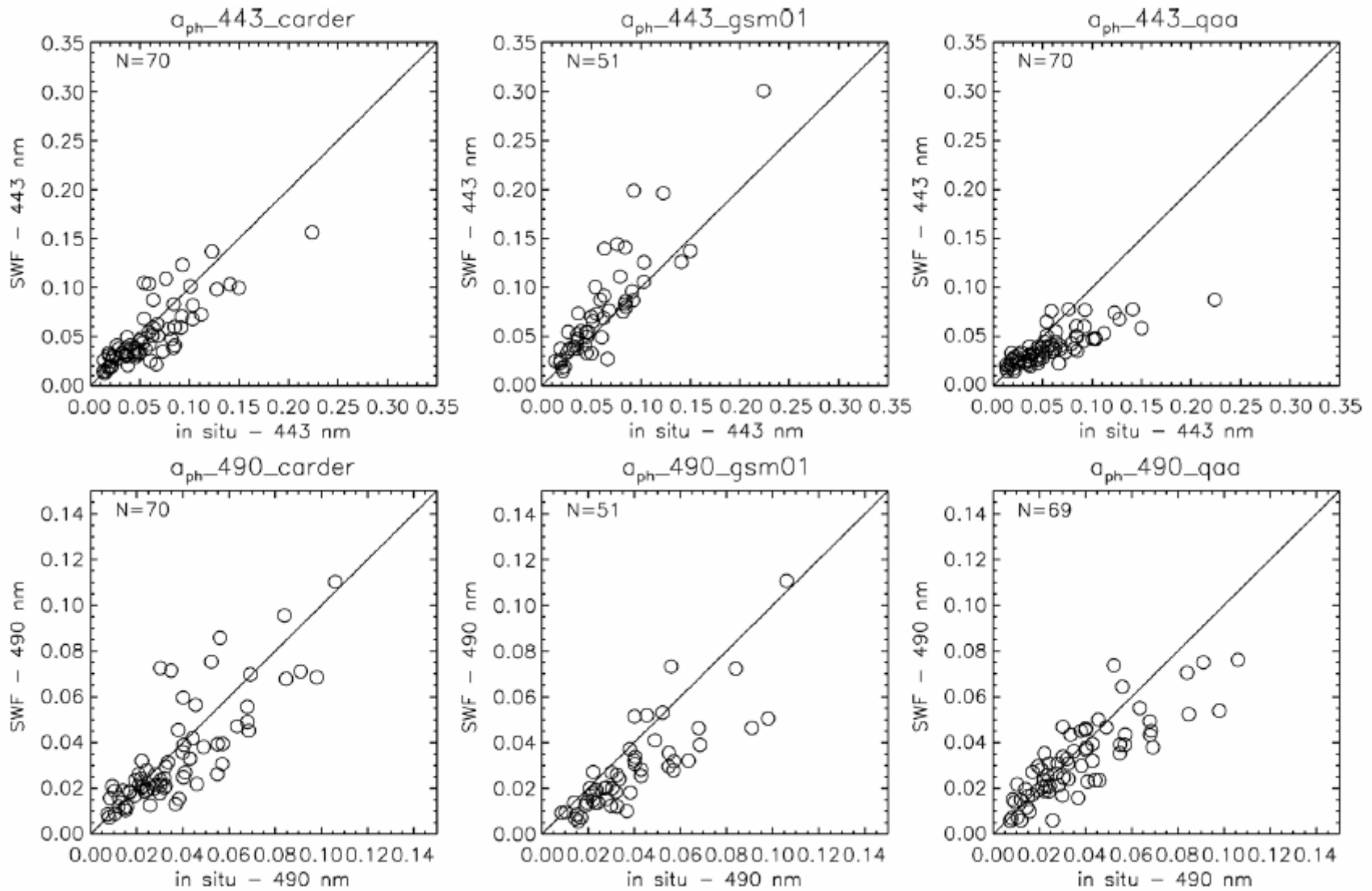
729 'bio-opt stations' from 1995-2009



G.Zibordi, J.F.Berthon, J.P.Doyle, S.Grossi, D. van der Linde, C.Targa, L.Alberotanza. Coastal Atmosphere and Sea Time Series (CoASTS), Part 1: A long-term measurement program. NASA Tech. Memo. 2002-206892, v. 19, S.B.Hooker and E.R.Firestone, Eds., NASA Goddard Space Flight Center, Greenbelt, Maryland, 2002, 29 pp.



# CoASTS: application (SeaWiFS)



F. Mélin, G. Zibordi, J.-F. Berthon (2007). Assessment of satellite ocean color products at a coastal site. Remote Sensing of Environment 110, 192–215.

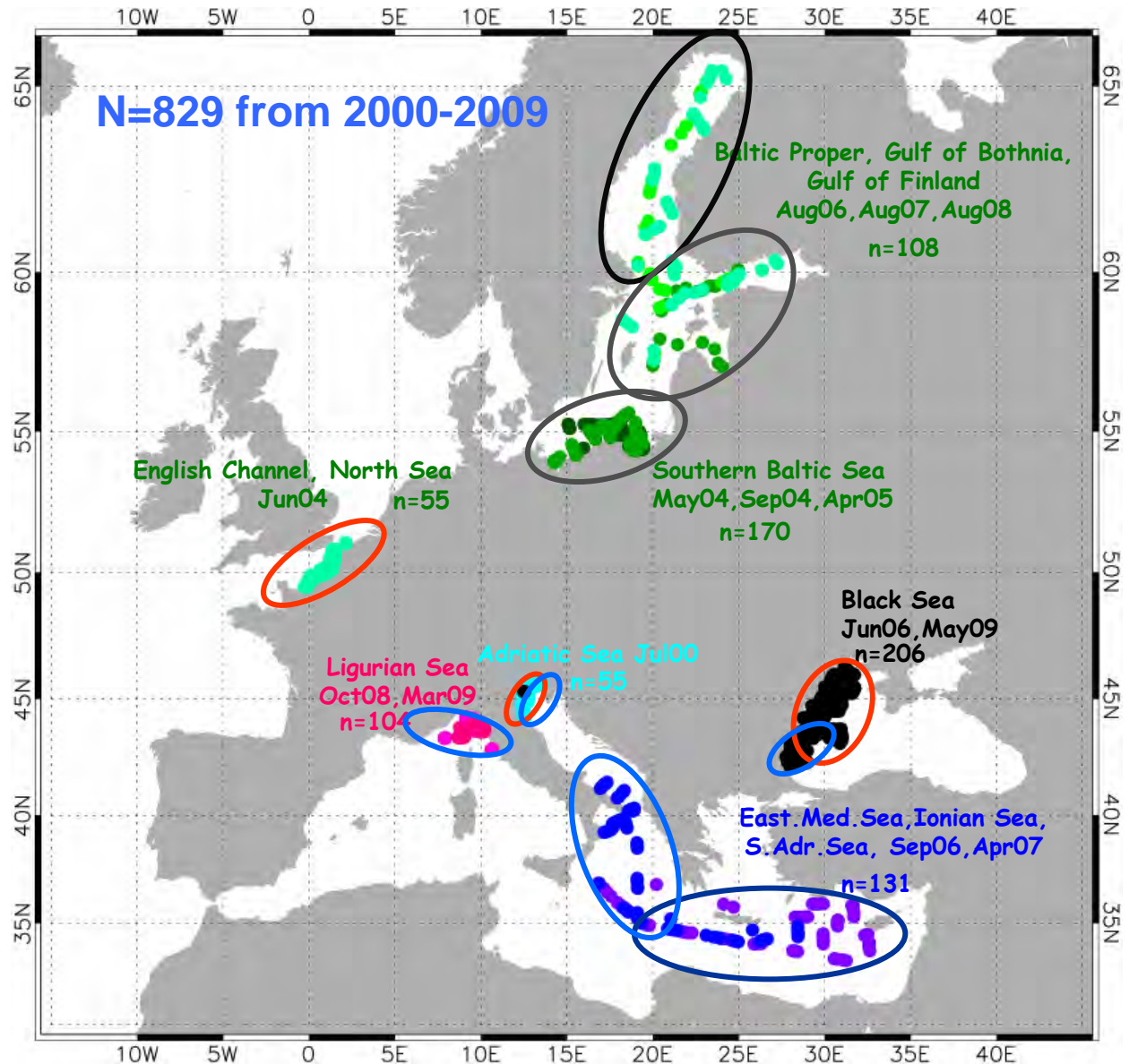


# BiOMaP

**AOPs and IOPs measurements performed applying cross-site identical and consolidated: technology, measurement and calibration protocols, processing codes and quality assurance criteria.**



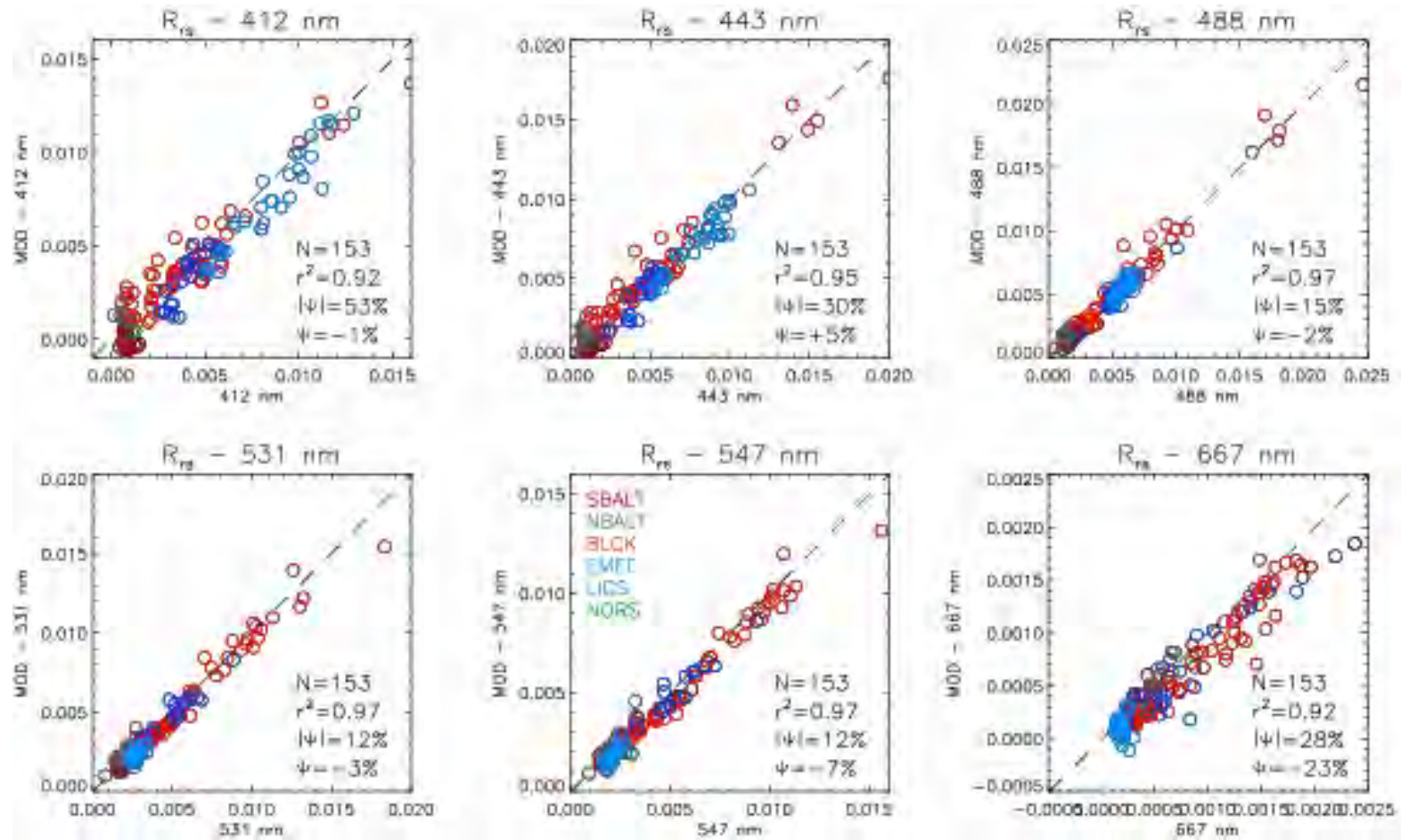
J.F. Berthon, F. Mélin and G. Zibordi. Ocean Colour Remote Sensing of the Optically Complex European Seas, in: V. Barale and M. Gade ed.s, "Remote Sensing of the European Seas", Springer, Dordrecht (NL), 35-52, 2007.







# BiOMaP: application (MODIS)

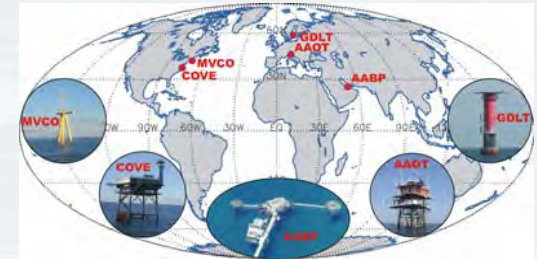




# Concluding remark

AERONET-OC satisfies the major requirements of traceable, globally distributed, continuous, cross-site consistent and accessible measurements. It is a major source of data for satellite ocean color validation.

Continuous CoASTS or spatially distributed BiOMaP data are an additional major source for satellite ocean color products development and assessment.



AERONET-OC, CoASTS and BiOMaP share similar data handling and processing based on standardization of measurements, instrument calibration, data analysis and quality assurance.

# Assessment of *In Situ* Radiometric Capabilities for Coastal Water Remote Sensing Applications (ARC)

Ocean color cal/val activity proposed as a CEOS/CVWG/IVOS action, funded by ESA, planned and organized by the JRC in collaboration with NPL.

## Objective:

Compare primary ocean color radiometric products (normalized water leaving radiance) from *in situ* optical radiometers using different instruments and applying different measurement methods

## Execution:

Field measurements at the AAOT (July , 19-23 2010)  
Laboratory calibrations at the JRC (July , 26-29 2010).

## Participants:

Ten European laboratories (8 radiometer systems).

