

New applications with geostationary ocean colour radiometry

Specific research topic:

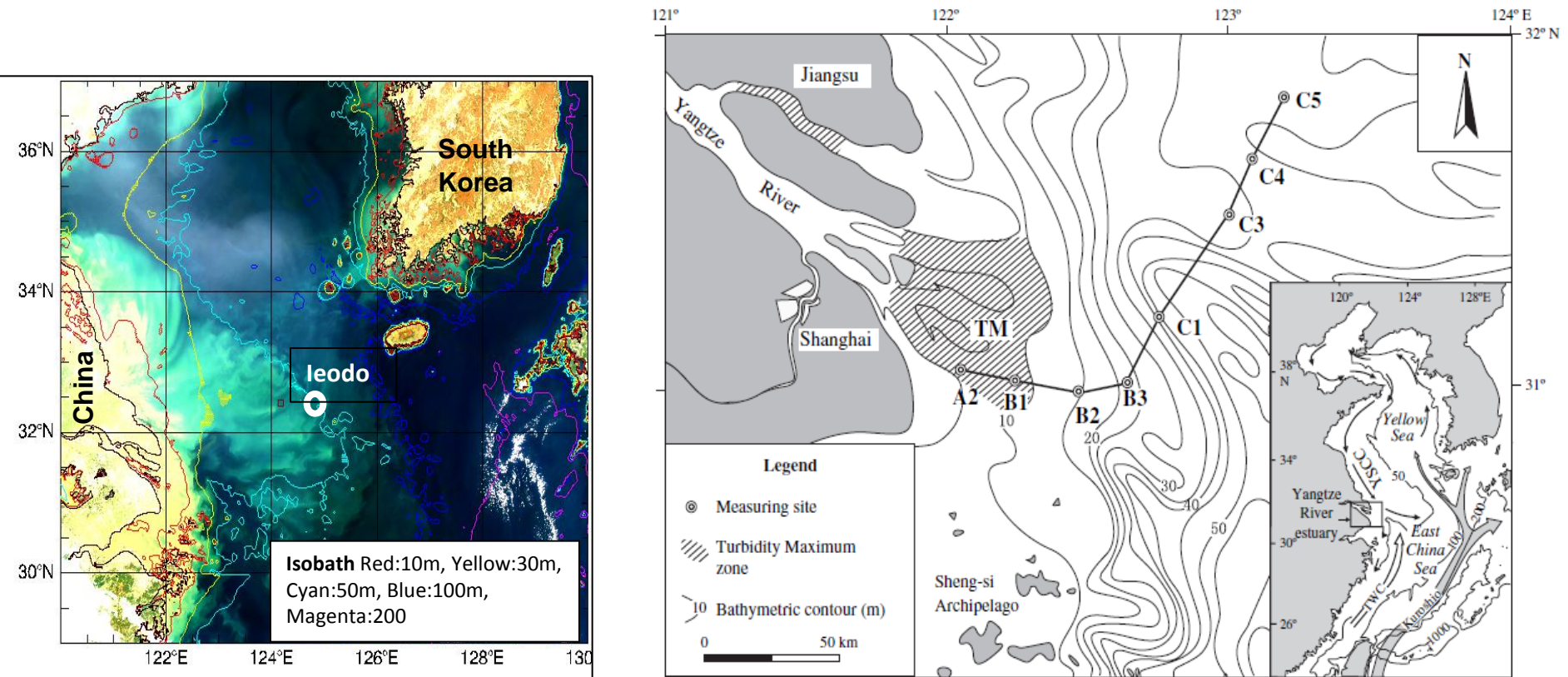
**“Dynamics of suspended particulate matter (SPM)
in river plumes”**

David Doxaran, LOV, CNRS-UPMC, France

And colleagues from ACRI-ST, KOSC-KIOST, MUMM, NOAA

Study areas viewed by GOCI

The Yangtze and Yellow Rivers (China) are two major world rivers in terms of freshwater discharge and export of terrestrial substances (e.g., SPM, POC)



(Zhang et al. 2012, 2007)

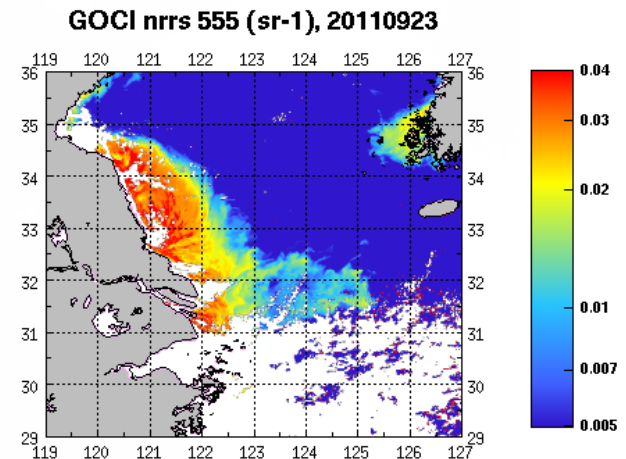
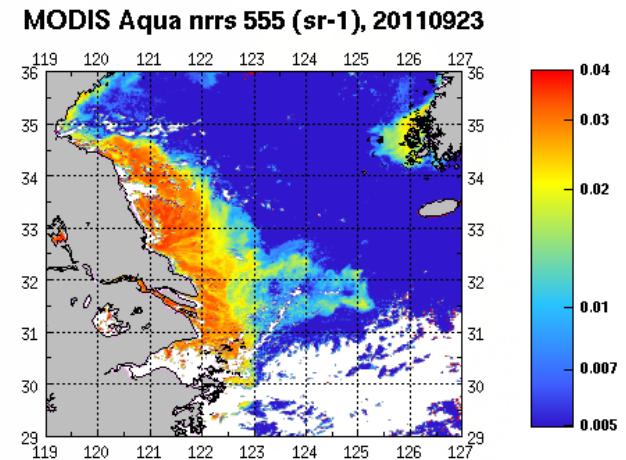
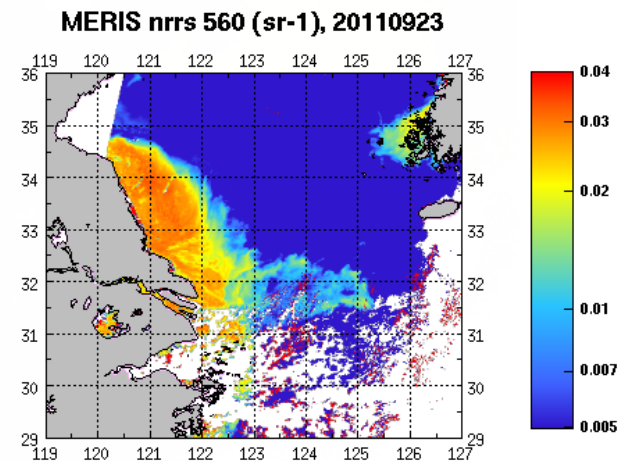
SPM algorithm: issues with GE

- Atmospheric optical depth (36 km)
- Low sun zenith angles (9am and 4pm)
- No SWIR band (GOCI)

Two **atmospheric correction** algorithms specific for turbid waters developed for GOCI:

- Ahn et al. (2012): extension of the **NIR similarity spectrum** (Ruddick et al. 2006) to extremely turbid waters
- Wang et al. (2012; 2013): Use of **invariant regional relationships** established between $nL_w(\text{NIR})$ and $K_d(490)$ derived from MODIS-Aqua products generated using the **SWIR atmospheric correction**

From Lamquin et al. 2012

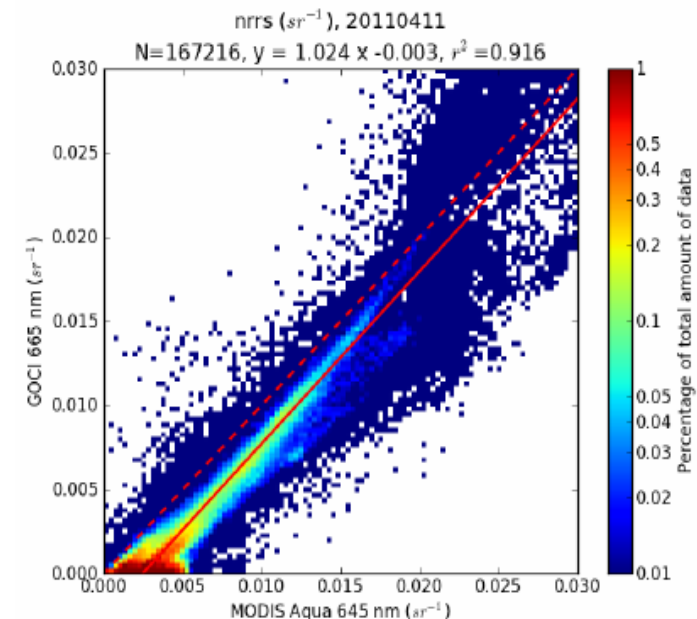
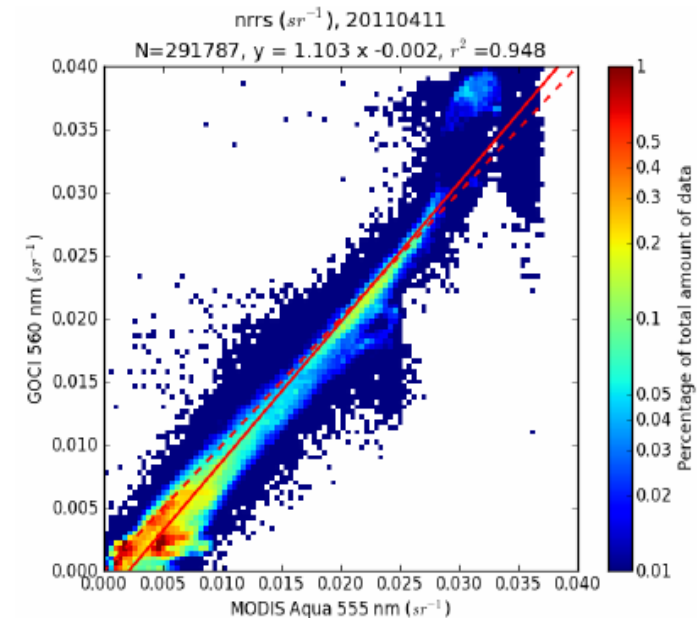
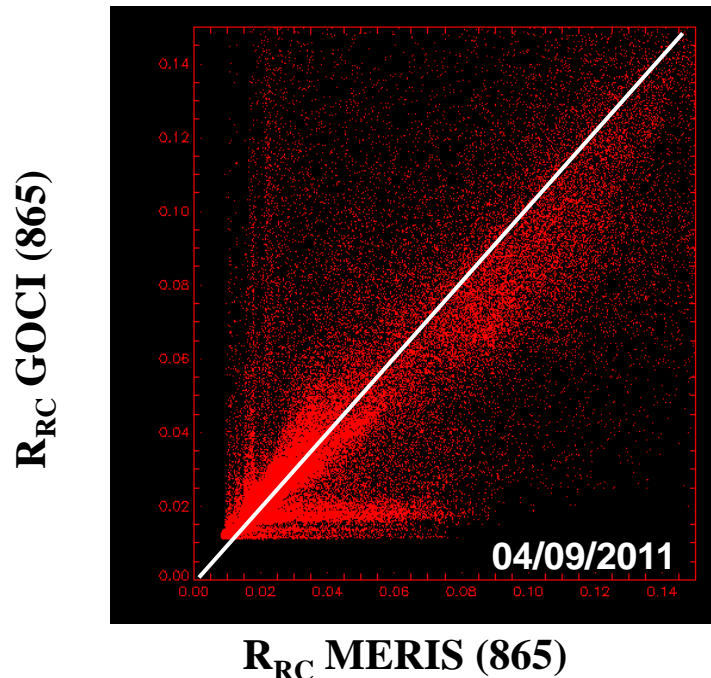


Assessment of GOCI seawater reflectance products

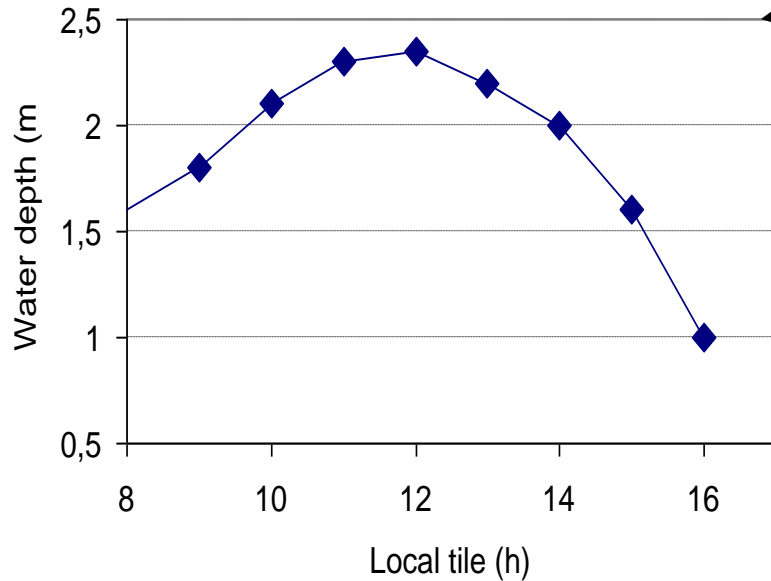
Comparing GOCI Rrs products (Ahn et al. 2012) to MODIS-Aqua Rrs (SWIR corrected (Wang and Shi 2007)

➔ Preliminary 'validation' of GOCI Rrs products in the **visible** (500 – 700 nm)

➔ Significant differences in the NIR



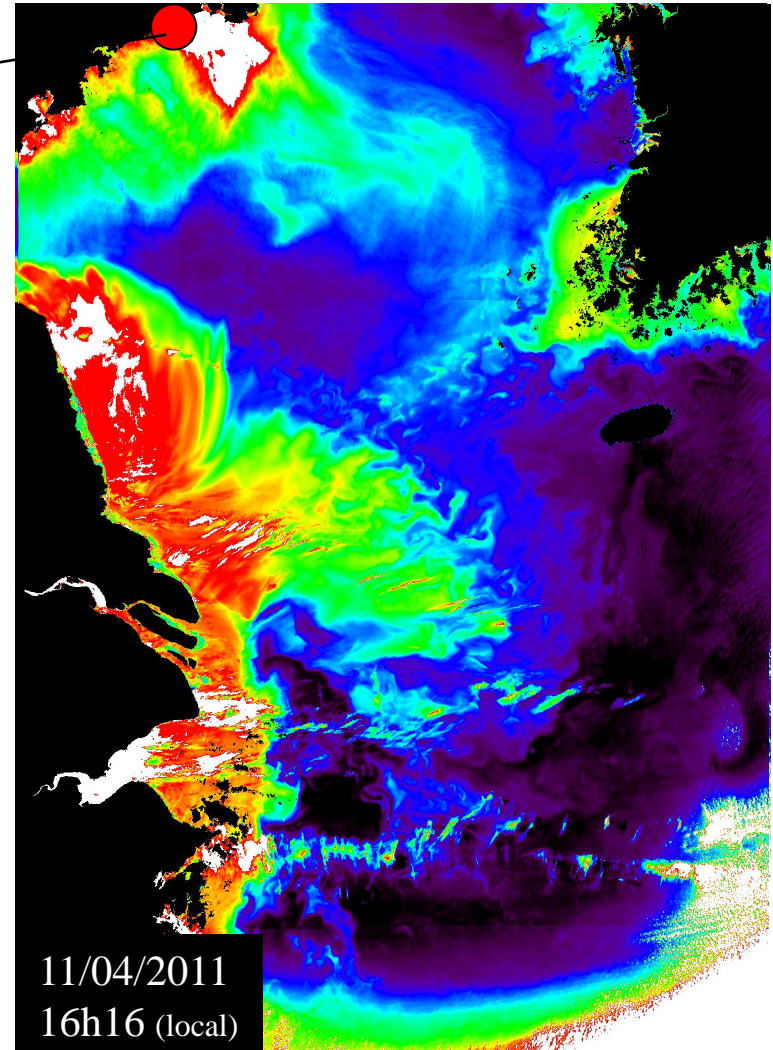
Applications: filter clouds and SPM tidal dynamics



➔ Hangzhou Bay appears (clouds)

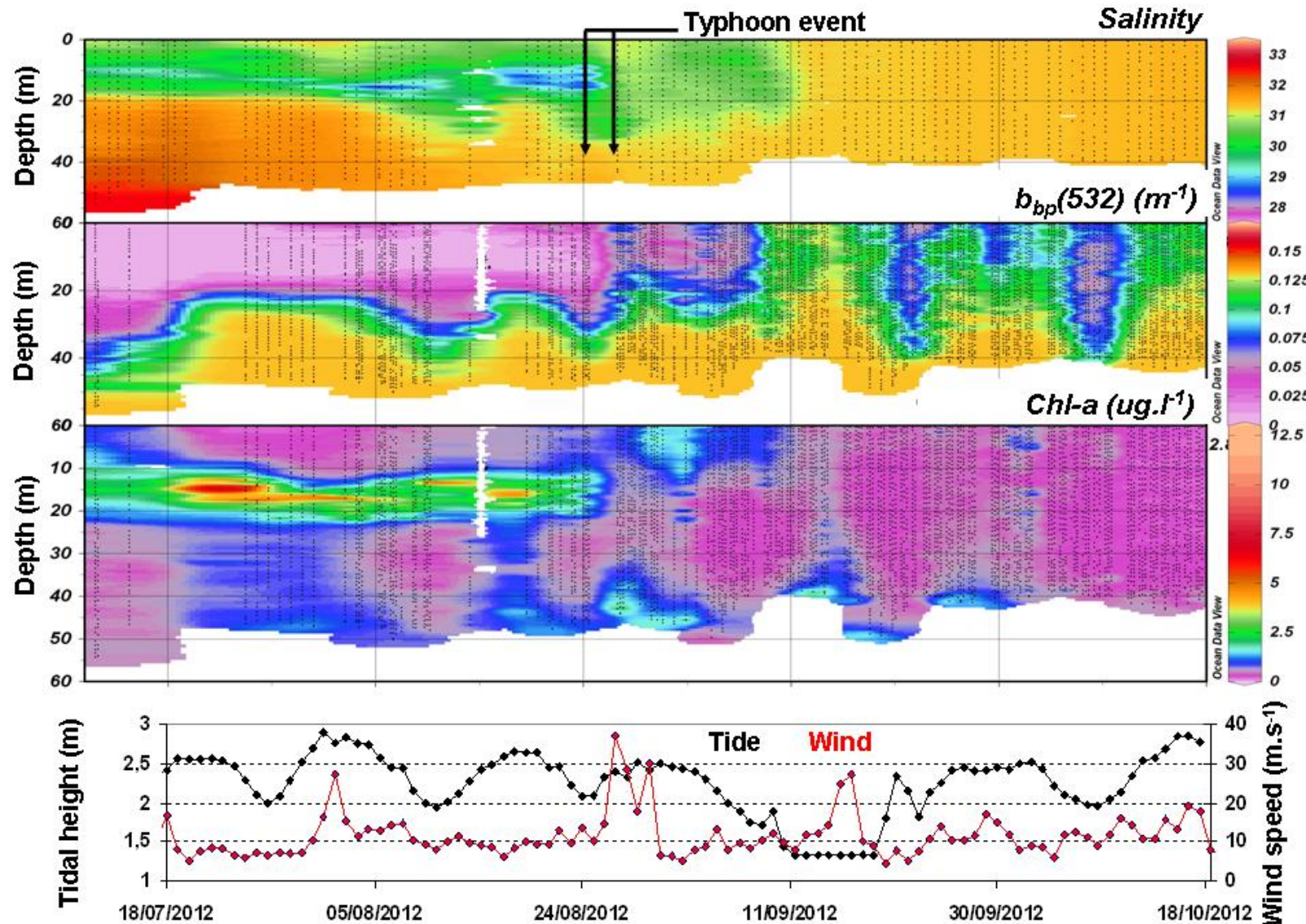
➔ Maximum turbidity at low water

Ongoing work...



$R_{RC}(560)$ (dl)

GEO satellite observations combined with data from autonomous profiling floats (Provbio)



► **The capabilities of GEO ocean colour remote sensing already demonstrated (GOCI)**

► **New applications:**

- in coastal waters: fluxes at land-sea interfaces, tidal dynamics and residual transport
- in the open ocean: daily cycles of primary production?

► **Future missions:**

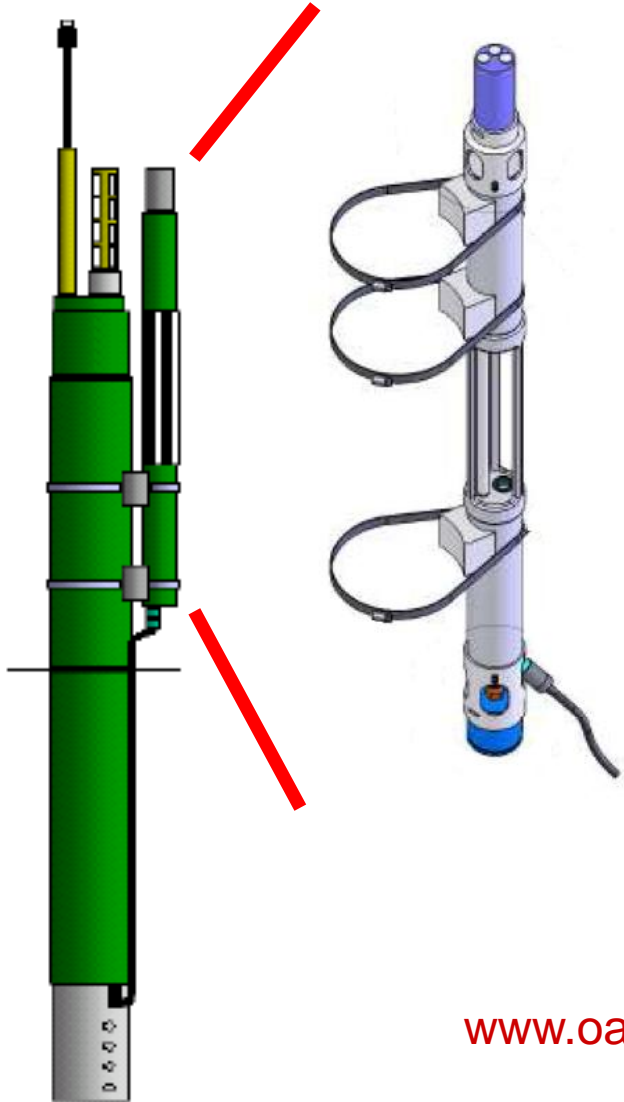
e.g., OCAPI mission

Ocean Color Advanced Permanent Imager

“A breakthrough in ocean sciences thanks to hourly observations of ocean colour in coastal zones and the open ocean from a geosynchronous orbit”

Provbio profiling float

Use of optical data from autonomous profiling and drifting floats in the Gironde and Rhône river plumes: the PROV PANACHE project (PI D. Doxaran)



Profiling floats: autonomous physical & optical measurements

PROVBIO : PROVOR + $c(660)$ + $b_b(555)$ + Chla
Fluo + CDOM Fluo + $Ed(3\lambda)$ + iridium

PI H. Claustre (LOV)

www.oao.obs-vlfr.fr/carto/index.html