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Ocean color remote sensing in the context of biogeochemical cycles: multi-disciplinary approach (marine optics *in situ* and remote sensing)

Part 1: Curriculum vitae

Education

2005 D. Sc. in oceanography Université Pierre et Marie Curie / Paris 6 (UPMC), France

1995 PhD in oceanography UPMC, France

1987 Master of Science Université de Bretagne Occidentale, Brest, France

Employment

July 2013- current Professor, Curtin University, Perth, Western Australia

Mid 2009- current CNRS senior scientist (DR2), LOV, France¹

Mid 2008- mid 2009 Visiting scientist, University of California at Santa Barbara², USA

2008 Promotion to CNRS senior scientist (DR2), LOV, France

1996-2007 CNRS research associate (CR2, then CR1 from 2000), LOV, France

1996 Post-Doctoral position shared between CNRS and a private company

1991-1995 PhD student, LOV, France

1989-1990 Data analyst, computer engineer, ORSTOM (now IRD), New Caledonia

2000-2010 Recurrent consulting activities with the European space industry

Bibliography summary (July 2015)

- ✓ 61 peer-reviewed publications
 - 16 as 1st author, 13 as 2nd author
 - 2781 citations, average citations: 47.95, **h_index 24** [ISI web of science, July 2015]
- ✓ 9 other publications, 1 book chapter, 2 IOCCG monographs as editor, 1 NASA tech memorandum
- ✓ 14 international invited conferences
- ✓ ~120 talks in international conferences

¹ En détachement à partir du 1^{er} Juillet 2014 (in « leave without pay » starting 1st July 2014).

² Host laboratory: ICESSE : “Institute for Computational Earth System Sciences”, now called “Earth Research Institute”; collaborator: Dave A Siegel

Selected activities, project management (more or less in reverse chronological order):

- ✓ **PI** of a French consortium for exploitation of the data from the GOCI ocean color sensor (Geostationary orbit; launched by the Korean space Agency on 2010).
- ✓ **PI** of the **BIOCAREX** project (ANR funding, 2011-2014; 4 French laboratories involved). Fundamental aspects and implications of the diel cycle of ocean optical properties.
- ✓ **PI** of a proposal for a future ocean color satellite mission from a geostationary orbit (“OCAPI” for *Ocean Color Advanced Permanent Imager*). This proposal includes 17 laboratories and institutions: LOV, LOCEAN, LSCE, LOG, LEGI, MERCATOR, SHOM, IFREMER, SZN Naples, FU Berlin, MUMM Belgium, JRC Ispra, CSIR-NRE South Africa, KORDI Korea, UCSB/ICISS USA, Univ. New Hampshire USA, NASA/GSFC USA) and 2 industrial partners (ACRI-st and EADS-Astrium)
- ✓ **Chair** of the IOCCG working group on “Ocean color from the geostationary orbit”. 2009-2011.
- ✓ **PI** of a “Research and technology” action funded by CNES, the goal of which being to develop radiance cameras for the measurement of the underwater radiance distribution (2003-on going)
- ✓ **PI** of the **GLOBPHY** project, (ANR funding, 2007-2009; 3 French laboratories involved). Theme: “Analysis of decadal changes in the global ocean phytoplankton through the synergistic use of satellite data and 1-dimensional and 3-dimensional models”
- ✓ **Science expert** for the **GlobCOLOUR** project (<http://www.globcolour.info>) ESA funding from 2006 to 2008. Merging of satellite data for studying long-term changes in ocean phytoplankton.
- ✓ **Chair** of the IOCCG working group on “Ocean-Colour Data Binning Issues”. 2002-2004
- ✓ **Lead** of a major reprocessing effort of historical and current ocean color satellite archives, in collaboration with the University of Miami, RSMAS (1997-2002).
- ✓ **PI** of “**BOUSSOLE**” (“Bouée pour l’acquisition d’une série optique à long terme” <http://www.obs-vlfr.fr/Boussole>). After ~10 years of activity, this project is internationally recognized as one of the major sites for cal/val of ocean color satellite observations. Funding agencies: ESA, CNES, NASA. I manage about 10 technical staff in the frame of this activity.
- ✓ **PI** of a proposal to the ESA call for the “Earth explorer 7” (2002), for a future ocean color satellite mission from a geostationary orbit (“BIOGEOSAT”). This proposal included 7 laboratories and institutions in Europe plus 4 industrial partners.
- ✓ Development of **MERIS** algorithms: from 1995 to 2003, I had a **leadership role** in the development of atmospheric corrections algorithms for the ESA MERIS ocean color satellite mission. This was done in the frame of the “Expert Support Laboratories” (6 European labs plus one private company).

Commitments and responsibilities in France (until 2013)

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|---|----------------|
| ✓ Co-director of the “groupe d’intérêt scientifique couleur de l’océan” (“GIS COOC” ³) | 2011 – 2013 |
| ✓ Lead investigator for the science team of the OCAPI satellite mission | 2009 – ongoing |
| ✓ Member of the steering committee of the GIS-COOC | 2010 – 2011 |
| ✓ Responsible of the “optics and remote sensing” department at LOV (25 people) | 2006 – 2008 |
| ✓ Chairman of the ocean group of the CNES scientific committee (TOSCA) | 2007 – 2009 |
| ✓ Member of the ocean group of the CNES scientific committee (TOSCA) | 1999 – 2007 |
| ✓ Member of the scientific committee of the “Programme National de Télédétection Spatiale” (PNTS) | 2002 – 2007 |

³ This is a “research consortium” jointly created with CNES, UPMC, CNRS and ACRI-ST (a private company). www.gis-cooc.org

National commitments and responsibilities in Australia (since 2014)

- ✓ Member of the “bio-optics working group” of IMOS (Australian « **Integrated Marine Observing System** ») 2014 – ongoing
- ✓ Member of the “scientific reference group” for WA-IMOS 2014 – ongoing
- ✓ Member of the National Australian “Committee for the International Indian Ocean Expedition 2” 2015 – ongoing
- ✓ Member of the “Australian Satellite Calibration Working Group” 2015 – ongoing

International commitments and responsibilities

- ✓ **Chairman** of IOCCG (International Ocean Colour Coordinating Group, SCOR) 2010 – 2014
see at www.ioccg.org
- ✓ **Member** of the European Space Agency
senior advisory board for Earth observation (ESAC⁴) 2009 – 2013
- ✓ **Associate Editor** for « Limnology & Oceanography » (IF 4.125) 2014 – ongoing
- ✓ **Member** of the NASA “PACE Science Definition Team”⁵ 2011 – 2012
- ✓ **Member** of the NASA field support group Advisory Committee 2011 – 2013
- ✓ **Member** of the IOCCG 2003 – 2009
- ✓ **Chairman** of IOCCG working group on GEO ocean colour observations 2008 – 2011
- ✓ **Chairman** of IOCCG working group on ocean colour data binning 2001 – 2004
- ✓ **Member** of the IOCCG working group on atmospheric corrections 2001 – 2009
- ✓ **Member** of a working group of the National Research Council (**NRC, US Academy of Sciences**), on “Assessing Requirements for Sustained Ocean Colour Research & Operations” <http://www8.nationalacademies.org/cp/projectview.aspx?key=49185> 2009 – 2011
- ✓ **Member** of the working group “Remote Sensing of Shelf Seas Ecosystems”
Marine Board of the ESF (European Science Foundation) 2005 – 2006
- ✓ **Member** of the EUROCEAN network of excellence 2005 – 2008
- ✓ **Member** of the MERIS Quality Working Group (ESA) 2003 – ongoing
- ✓ **Member** of the Sentinel3 Validation team (ESA/EUMETSAT) 2013 – ongoing
- ✓ **Participant** to the NASA SIMBIOS Project 2000 – 2002
- ✓ **Participant** to the NASA “Primary Productivity Algorithm Round Robin” project 1999 – 2011

Teaching

This is only occasional teaching on marine optics and ocean colour remote sensing.

- ✓ April 1992, 1993, 1994: short courses for Master students.
- ✓ 15 November 1994: Conference at University P. & M. Curie, Paris (Master students)
- ✓ 2 November 1995: Conference at University of Marseille.
- ✓ 7 May 1998, Conference at University of Marseille.
- ✓ 19 November 1998, conferences at University Paris 6 (Master students).
- ✓ Seminar at LSCE, Paris, 2000.
- ✓ Seminar at LOA, Lille, 2001
- ✓ Short course at LSEET, Toulon, le 6 January 2005 (Master).

⁴ Extract from the terms of reference: “ESAC is the senior advisory board to the Director of Earth observation programs, ..., on all matters concerning the Agency’s scientific objectives for Earth observation from space”.

⁵ <http://dsm.gsfc.nasa.gov/pace-2011sdteam.html>

Students and post-Doc supervision

PhDs (all from Université Pierre & Marie Curie / Paris 6, France). Date of defense

- 2005** **Delphine Nobileau.** 2 peer-reviewed papers.
2006 **Nordine Souaidia.** Resigned after a year; now working in a company in Germany
2009 **Pierre Gernez.** 2 peer-reviewed papers. Now associate Prof. at Univ. Nantes, France
2014 **Malika Kheireddine** (in the frame of the BIOCAREX project)

Post-Docs

- 2004-2006** **Fabrizio d’Ortenzio.** Now research scientist at CNRS in our research group
2007-2008 **Terry O’Bree,** BOUSSOLE project. Now in Australia.
2007-2010 **Elodie Martinez,** GLOBPHY project. Now research scientist at IRD, Marseille
2011-2012 **Shaoqi Gong,** BOUSSOLE project
2012-2014 **Emanuele Organelli** (BIOCAREX project)
2012-2014 **Morvan Barnes** (BIOCAREX project)
2015-.. **Bozena Wojtasiewicz** (co-supervision with Nick Hardman-Mountford, CSIRO, Perth)

Others

- 1995** **Catherine Myrmehl,** 3-month internship
1999 **Joséphine Ras,** 6-month internship from Univ. Southampton, UK. Best ranking.
2005 **Endreï Marken,** 3-month internship from Bergen University
2005 **Nicolas Duval,** 6-month internship from Univ. Toulon
2011 **Alexandra Cherkasheva,** 2-month internship from Univ. Bremen

Theses committees

- ✓ As committee member for Emmanuel Bosc (Univ. Toulon, 2003).
- ✓ As Thesis supervisor for Delphine Nobileau (Univ. Paris 6, June 2005).
- ✓ As Rapporteur for Séverine Alvain (Univ. Paris 6, 19 December 2005).
- ✓ As committee member for DSc of Cyril Moulin (UVSQ, 24 October 2006).
- ✓ As committee member for Monique Messié (Univ. Toulouse, 15 December 2006).
- ✓ As Thesis supervisor for Pierre Gernez (Univ. Paris 6, June 2009).
- ✓ As committee member for Abdou Kane (UVSQ, 26 March 2010)
- ✓ As committee member for Manchun Lei (Univ. Toulon, 6 December 2011)
- ✓ As Rapporteur for Griet Nekermans (Univ. Littoral, April 2012).
- ✓ As Thesis supervisor for Malika Kheireddine (Univ. Paris 6, April 2014).

Major recent funding

- ✓ 2000-2011 3.500.000 € BOUSSOLE project (recurrent support from CNES, ESA, INSU), still ongoing
- ✓ 2001-2011 360.000 US\$ BOUSSOLE, research agreement between NASA and UPMC
- ✓ 2011-2014 630.000 € BIOCAREX project, *Agence Nationale de la Recherche* (ANR)
- ✓ 2007-2009 456.000 € GLOBPHY project, *Agence Nationale de la Recherche* (ANR)
- ✓ 2000-2006 150.000 € Radiance camera development (CNES and INSU)
- ✓ 2003-2005 100.000 € Atmospheric signal form a geostationary orbit (KORDI, Korea)

Lead of research expeditions

1. Chief scientist for the BOUSSOLE-AOPEX cruise (Mediterranean Sea, August 2004; 20 days, 17 international participants aboard the 56-m “Suroît” R/V;
<http://www.obs-vlfr.fr/Boussole/html/cruises/monthly.php> #35 in 2004)
2. Chief scientist for most of the BOUSSOLE monthly cruises in 2001-2002, and more occasionally since 2003 (“Tethys-II” R/V)
3. Chief scientist for all deployment and recovery cruises for the BOUSSOLE moorings (24 operations since 2000; see <http://www.obs-vlfr.fr/Boussole/html/cruises/buoy.php>)

Participation to research expeditions

1. PROPPAC 4 (ORSTOM, Southwest Pacific, One month, November 1989).
2. EUMELI 4 (LOV, Northeast tropical Atlantic, One month, June 1992)
3. MALINA, (LOV, Beaufort Sea, Arctic, 5 weeks, July-August 2009)

Long stays overseas

1. December 1988 - March 1990 (16 months): Nouméa ORSTOM centre, New Caledonia (in the frame of a civil scientific service in lieu of a 12-month military service).
2. 2 March – 26 April 1997 (2 months) : University of Miami “Rosenstiel School of Marine and Atmospheric Sciences (RSMAS)” : collaboration with Pr. Howard Gordon (atmospheric corrections and reprocessing of satellite archives for global scale studies).
3. July 2008 – August 2009 (1 year). Visiting scientist at the University of California at Santa Barbara (UCSB).

Organization of international conferences

1. Organizer of the 2015 IOCS conference (<http://iocs.ioccg.org>). 250 international participants.
2. Chair and organizer of the 2013 IOCS conference (<http://iocs.ioccg.org>). 240 international participants.
3. Organization of an international IOCCG summer lecture series (July 2012 & 2014). See at http://www.ioccg.org/training/SLS_2012.html or [SLS_2014.html](http://www.ioccg.org/training/SLS_2014.html)
4. Member of the scientific committee for the « Earth Observation for Ocean-Atmosphere Interactions Science » conference (<http://www.eo4oceanatmosphere.info/>), co-organized by ESA, SOLAS and EGU. 29 Nov. – 2 Dec. 2011, European Space Agency, ESRIN, Italie
5. Co-chairman with Ken J. Voss of the 19th “Ocean Optics” conference, October 2008, Italy (~300 international participants)
6. Member of the planning committee for the 18th “Ocean Optics” conference, Oct. 2006, Montreal (~300 international participants). Idem for the 19th and 21st editions (2008 and 2012).
7. Organisation of an IOCCG workshop on “ ocean colour observations from the geostationary orbit”, Jeju, South Korea, November 2008 (12 international participants)
8. Organisation of the 1st meeting of the GlobCOLOUR project, in Villefranche, December 2006 (50 international participants). See at http://www.globcolour.info/workshops_forum_agenda.html
9. Co-organiser with H. Claustra of the session “Marine optics and biogeochemistry: from micro- to global scale (BG3)” at the 27th EGS assembly, Nice, 2002.

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10. Organisation of an IOCCG workshop in Villefranche (October 25-26, 2001, on “ocean colour data binning issues”; <http://www.ioccg.org/groups/antoine.html> ; 8 international participants)

Outreach

- ✓ Participation to a TV program « La Méditerranée on the « La 5 » channel (20 - 24 December 1999).
- ✓ Participation to the « La navigation des savoirs » project, funded by the European « Euromed Heritage II » program.
- ✓ Conference given at the POP-Sud organization (www.popsud.org) on the LOV activities in marine optics (16 Nov. 2004)
- ✓ Presentation on «Suivi de la production primaire phytoplanctonique à partir des observations satellite », for the 15th conference of the association « Réserve Internationale Maritime en Méditerranée Occidentale » (Nice, 24 Nov. 2007).
- ✓ Article « La vie en couleur des océans », in “El Watan” (Algerian daily newspaper), Saturday 18 July 2009.
- ✓ Article on the Web INSU, December 2009
http://www.insu.cnrs.fr/a3307_influence-oscillations-climatiques-decennales-bassins-oceaniques-phytoplancton.html
- ✓ Contribution (interview) for an article in the monthly magazine “La Recherche” («L’océan perd sa chlorophylle», by F. Heimbürger ; N°448, January 2011)
- ✓ Contribution (interview) for an article in the daily newspaper “Le Monde” (« Le plancton sous surveillance », by S. Foucart, Saturday 19 February 2011)

Part 2: exhaustive list of peer-reviewed publications and other productions

Peer-reviewed publications. The numbers in square brackets are: [times cited; from ISI web of science, July 2015] [5-year impact factor of the journal, also from ISI web of science]

1. Morel, A. and D. Antoine, 1994. Heating rate within the upper ocean in relation to its bio optical state. *Journal of Physical Oceanography*, **24**, 1652-1665. [129] [2.951]
2. Antoine, D. and A. Morel, 1995. Modelling the seasonal course of the upper-ocean pCO₂. 1 - Development of a one-dimensional model. *Tellus* **47B**, 103-121. [13] [3.476]
3. Antoine, D. and A. Morel, 1995. Modelling the seasonal course of the upper-ocean pCO₂. 2 - Validation of the model and sensitivity studies. *Tellus* **47B**, 122-144. [16] [3.476]
4. Antoine, D., A. Morel and J.M. André, 1995. Algal pigment distribution and primary production in the Eastern Mediterranean as derived from Coastal Zone Color Scanner observations, *Journal of Geophysical Research* **100**, 16,193-16,209. [115] [3.546]
5. Antoine, D. and A. Morel, 1996. Oceanic primary production : I. Adaptation of a spectral light-photosynthesis model in view of application to satellite chlorophyll observations, *Global Biogeochemical Cycles* **10**, 43-55. [98] [5.846]
6. Antoine, D., J.M. André, and A. Morel, 1996. Oceanic primary production : II. Estimation at global scale from satellite (Coastal Zone Color Scanner) chlorophyll, *Global Biogeochemical Cycles* **10**, 57-69. [422] [5.846]
7. Morel, A., D. Antoine, M. Babin, and Y. Dandonneau, 1996. Measured and modelled primary production in the Northeast Atlantic (EUMELI JGOFS program) : the impact of natural variations in photosynthetic parameters on model predictive skill, *Deep-Sea Research* **43**, 1273-1304. [90] [2.925]
8. Antoine, D., and Morel, A., 1998. Relative importance of multiple scattering by air molecules and aerosols in forming the atmospheric path radiance in the visible and near-infrared parts of the spectrum, *Applied Optics* **37**, 2245-2259. [19] [1.701]
9. Antoine, D. and A. Morel, 1999. A multiple scattering algorithm for atmospheric correction of remotely-sensed ocean colour (MERIS instrument) : principle and implementation for atmospheres carrying various aerosols including absorbing ones, *International Journal of Remote Sensing* **20**, 9: 1875-1916. [99] [1.674]
10. Bricaud, A., E. Bosc, and D. Antoine, 2002. Algal biomass and sea surface temperature in the Mediterranean basin : intercomparison of data from various satellite sensors and implications for primary production estimates, *Remote Sensing of Environment* **81**(2-3), 163-178. [90] [6.144]
11. Campbell J., D. Antoine, R. Armstrong, W. Balch, R. Barber, M. Behrenfeld, R. Bidigare, J Bishop, M-E Carr, W. Esaias, P. Falkowski, N. Hoepffner, R. Iverson, D. Kiefer, O. Kopelevich, S. Lohrenz, J. Marra, A. Morel, J. Ryan, V. Vedernikov, K. Waters, C. Yentsch, and J. Yoder, 2002. Comparison of algorithms for estimating primary productivity from surface chlorophyll, temperature and irradiance, *Global Biogeochemical Cycles* **16**, 3, 10.10129, 2001, GB001444 [74] [5.846]
12. Claustre H., A. Morel, S. B. Hooker, M. Babin, D. Antoine, K. Oubelkheir, A. Bricaud, K. Leblanc, B. Quéguiner, and S. Maritorena, 2002. Is desert dust making oligotrophic waters greener. *Geophysical Research Letters* **29**, 10, 10.1029/2001GL014056. [51] [4.070]
13. Morel, A. and D. Antoine, 2002. Small critters - Big effects. *Science* **296**, 1980-1982. [13] [33.587]
14. Morel, A., Antoine, D. and B. Gentili, 2002. Bidirectional reflectance of oceanic waters: Accounting for Raman emission and varying particle phase function, *Applied Optics* **41**, 6289-6306. [123] [1.701]

15. Antoine D., Morel, A., Gentili, B., Gordon, H.R., Banzon, V.F., Evans, R.H., Brown, J.W., Walsh, S., Baringer W. and A. Li, 2003, In search of long-term trends in ocean color. *EOS Trans AGU*, 84 (32), 12 August 2003. 301;308-309
16. Bosc, E., A. Bricaud and D. Antoine, 2004. Seasonal and interannual variability in algal biomass and primary production in the Mediterranean Sea, as derived from four years of SeaWiFS observations. *Global Biogeochemical Cycles*, 18 (1) , GB1005, 10.1029/2003GB002034. [122] [5.846]
17. Nobileau, D. and D. Antoine, 2005. Detection of blue-absorbing aerosols using near infrared and visible (ocean color) remote sensing observations. *Remote Sensing of Environment*, 95, 368-387. [22] [6.144]
18. Antoine D., Morel, A., Gordon, H.R., Banzon, V.F. and R.H. Evans, 2005. Bridging ocean color observations of the 1980's and 2000's in search of long-term trends. *Journal of Geophysical Research*, 110, C06009, doi:10.1029/2004JC002620. [70] [3.546]
19. D'Ortenzio F., D. Iudicone, C. DeBoyer Montegut, P. Testor, D. Antoine, S. Marullo, R. Santoleri, G. Madec and U. Send, 2005. Seasonal variability of the mixed-layer depth in the Mediterranean as derived from in situ profiles, *Geophysical Research Letters*, 32, L12605, doi:10.1029/2005GL022463. [48] [4.070]
20. Carr M.-E., M.A.M. Friedrichs, M. Schmeltz, M.N. Aité, D. Antoine, K.R. Arrigo, I. Asanuma, O. Aumont, R. Barber, M. Behrenfeld, R. Bidigare, E. Buitenhuis, J. Campbell, A. Ciotti, H. Dierssen, M. Dowell, J. Dunne, W. Esaias, B. Gentili, S. Groom, N. Hoepffner, J. Hishisaka, T. Kameda, C. LeQuéré, S. Lohrenz, J. Marra, F. Mélin, K. Moore, A. Morel, T. Reddy, J. Ryan, M. Scardi, T. Smyth, K. Turpie, G. Tilstone, K. Waters, Y. Yamanaka, 2006. A comparison of global estimates of marine primary production from ocean color, *Deep-Sea Research II*, 53, 741-770. [174] [2.925]
21. Antoine D. and D. Nobileau, 2006. Recent increase of the dust load over the Mediterranean Sea, as revealed from 6 years of ocean color satellite (SeaWiFS) observations, *Journal of Geophysical Research, Atmosphere* 111, D12214, doi:10.1029/2005JD006795.[36] [3.546]
22. Gattuso J.-P., Gentili B., Duarte C. M., Kleypas J. A., Middelburg J. J. & D. Antoine, 2006. Light availability in the coastal ocean: impact on the distribution of benthic photosynthetic organisms and their contribution to primary production. *Biogeosciences* 3: 489-513. [62] [4.178]
23. Voss, K., Morel, A. and D. Antoine, 2007. Detailed validation of the bidirectional effect in various Case 1 waters for application to Ocean Color imagery. *Biogeosciences*, 4, 781-789. [12] [4.178]
24. Morel, A., Claustre, H., Antoine, D. and B. Gentili, 2007. Natural variability of bio-optical properties in Case 1 waters: attenuation and reflectance within the visible and near-UV spectral domains, as observed in South Pacific and Mediterranean waters. *Biogeosciences*, 4, 913-925. [26] [4.178]
25. Dortenzio, F., D. Antoine and S. Marullo, 2008. Satellite-driven modelling of the upper ocean mixed layer and air-sea CO₂ flux in the Mediterranean Sea, *Deep-Sea Research, part I*, 55, 405-434. [11] [2.925]
26. Antoine, D., P. Guevel, J.-F. Desté, G. Bécu, F. Louis, A.J. Scott and P. Bardey, 2008. The «BOUSSOLE» buoy; a new transparent-to-swell taut mooring dedicated to marine optics: design, tests and performance at sea, *Journal of Atmospheric and Oceanic Technology*, 25, 968-989. [8] [2.283].
27. Antoine, D., F. D'Ortenzio, S.B. Hooker, G. Bécu, B. Gentili, D. Tailliez and A.J. Scott, 2008. Assessment of uncertainty in the water-leaving reflectance determined by three satellite ocean color sensors (MERIS, SeaWiFS, MODIS-A) at an offshore site in the Mediterranean Sea (BOUSSOLE project), *Journal of Geophysical Research, Oceans*, 113, C07013, doi:10.1029/2007JC004472. [58] [3.546]

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28. Bailey, S., S.B. Hooker, D. Antoine, B.A. Franz, and P.J. Werdell, 2008. Sources and assumptions for the vicarious calibration of ocean color satellite observations, *Applied Optics*, **47**, 2035-2045. [11] [1.701]
 29. Friedrichs, M.A.M., M.-E. Carr, R. T. Barber, M. Scardi, D. Antoine, R. A. Armstrong, I. Asanuma, M. J. Behrenfeld, E. T. Buitenhuis, F. Chai, J. R. Christian, A. M. Ciotti, S. C. Doney, M. Dowell, J. Dunne, B. Gentili, W. Gregg, N. Hoepffner, J. Ishizaka, T. Kameda, I. Lima, J. Marra, F. Mélin, J. K. Moore, A. Morel, R. T. O'Malley, J. O'Reilly, V. S. Saba, M. Schmeltz, T. J. Smyth, J. Tjiputra, K. Waters, T. K. Westberry, A. Winguth, 2009. Assessing the uncertainties of model estimates of primary production in the tropical Pacific ocean, *Journal of Marine Systems*, doi:10.1016/j.jmarsys.2008.05.010. [70] [2.608]
 30. Banzon, V F , H.R. Gordon, C.P. Kuchinke, D. Antoine, K.J. Voss, and R.H. Evans, 2009. Validation of a SeaWiFS dust-correction methodology in the Mediterranean Sea: Identification of an algorithm-switching criterion, *Remote Sensing of Environment*, **113**, 2689–2700. [3] [6.144]
 31. Dubuisson P., R. Frouin, D.Dessailly, L.Duforêt, J.-F. Léon, K.Voss and D. Antoine, 2009. Estimation of aerosol altitude from reflectance ratio measurements in the O2 A-band, *Remote Sensing of Environment*, **113**, 1899–1911. [14] [6.144]
 32. Gernez, P. and D. Antoine, 2009. Field characterization of wave-induced underwater light field fluctuations. *Journal of Geophysical Research*, **114**, C06025, doi:10.1029/2008JC005059. [15] [3.546]
 33. Martinez E., D. Antoine, F. D'Ortenzio and B. Gentili, 2009. Climate-driven basin-scale decadal oscillations of oceanic phytoplankton, *Science*, **326**, 1253-1256. [80] [33.587]
 34. Saba V.S., M A. M. Friedrichs, M.E. Carr, D. Antoine , R. A. Armstrong, I. Asanuma, O. Aumont, N.R. Bates, M.J. Behrenfeld , V. Bennington, L.Bopp, J.Bruggeman, E.T. Buitenhuis, M.J. Church, A.M. Ciotti, S.C. Doney, M.Dowell, J.Dunne, S.Dutkiewicz , W.Gregg, N.Hoepffner, K.J. W. Hyde, J.Ishizaka , T. Kameda, D.M. Karl, I.Lima, M.W. Lomas, J.Marra , G.A. McKinley, F.Mélin, J. K.Moore, A.Morel, J.O'Reilly , B. Salihoglu, M. Scardi, T.J. Smyth, S.Tang, J.Tjiputra, J. Uitz , M.Vichi, K.Waters, T.K. Westberry, A.Yool, 2010. The challenges of modeling depth-integrated marine primary productivity over multiple decades: A case study at BATS and HOT, *Global Biogeochemical Cycles*, **24**, GB3020, doi:10.1029/2009GB003655. [36] [5.846]
 35. Antoine D, D.A. Siegel, T Kostadinov, S. Maritorena, N.B. Nelson, B. Gentili, V. Vellucci and N. Guillocheau, 2011. Variability in optical particle backscattering in three contrasting bio-optical oceanic regimes, *Limnology and Oceanography*, **56**(3), 2011, 955–973. [15] [4.125]
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Invited talks / lectures

1. Antoine D. and A. Morel, 1999. First estimates of global primary production based on recent ocean colour satellite observations, IUGG conference, IAPSO symposium P15 « optical oceanography and UV radiation », Birmingham, 26-30 July 1999.
2. Morel A. and D. Antoine, 1999, Global estimates of primary production from ocean colour satellite observations, ALPS 1999 conference, Méribel, France, 18-22 January 1999.
3. Antoine D. and A. Morel, 1999. Reprocessing of the CZCS archive in view of comparison with the ocean color data from the new-generation sensors. Annual SIMBIOS meeting, Annapolis, USA, Sept. 13-15, 1999.
4. Antoine, D., 2004, The role of optical observations in ocean observing systems, Ocean Optics XVII conference, Fremantle, Australia, Oct. 25-29, 2004.
5. Antoine, D., 2007, Decadal changes in global ocean chlorophyll. Surface Ocean CO2 Variability and Vulnerabilities Workshop, UNESCO, Paris, France, April 11-14, 2007
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7. Antoine, D., 2010. Climate-driven decadal changes in ocean chlorophyll (satellites, models and field data). Oceans from space 2010 symposium, Venice, Italy, April 26-30, 2010.
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9. Antoine, D., 2011. Ocean splinter session: “Applications in climate studies and climate modelling”, Sentinels for Science workshop, ESA/ESRIN, Frascati, March 2011.
10. Antoine, D., 2011. Changements récents de la biomasse océanique révélés par les observations satellitaires de la « couleur de l’océan », Invited seminar at the “Collège de France”, Paris, Mai 2011.
11. Antoine, D., 2011. Climate-driven decadal changes in ocean chlorophyll (satellites, models and field data). Invited seminar at the Rosenstiel School of Marine and atmospheric Sciences (RSMAS), Univ. Miami, USA, December 2011.
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13. Antoine D., E. Martinez, and D. Raitsos, 2013, A deeper and greener mixed layer in the North Atlantic Subpolar Gyre (decadal variability of phytoplankton biomass), présentation invitée dans la série des séminaires du CSIRO/UTAS, Hobart, Tasmanie, 10 Septembre 2013.
14. Antoine D., E. Leymarie, D. Doxaran, S. Marty, B. Gentili, 2014. Reflectance bidirectionality in coastal turbid waters, Australian Marine Science Association 2014 conference, Canberra, ACT, 7-10 July 2014.

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1993-1994

1. Antoine D. and A. Morel, 1993. A one-dimensional coupled physical-biological-chemical model and its validation at the Ocean Weathership Station Papa (OWSP), ESCOBA Fall meeting, “The global carbon cycle and its perturbation by man and climate”, Toulouse 15-17 Novembre 1993.
2. Antoine D. and A. Morel, 1993. “Chlorophyll-like” pigment distribution and temporal evolution within the Eastern Mediterranean sea and implications of the phytoplankton in carbon dioxide exchanges between ocean and atmosphere, Ocean Colour European Archive Network, 2nd meeting, 09-10 Fevrier 1993, J.R.C. of the C.E.C., Ispira, Italy.
3. Antoine, D. and A. Morel, 1993. Modeling the seasonal course of the upper-ocean pCO₂ : a one-dimensional coupled physical-biological-chemical model and its validation at the Ocean Weathership Station Papa (OWSP). In : CO₂ 4th International Conference, Carqueiranne, France, 13-17 Septembre 1993. World Meteorological Organization - Global Atmosphere Watch, Report N° 89, p. 157.
4. Antoine, D. and A. Morel, 1994. Pigment distribution and primary production in the Eastern Mediterranean as derived and modeled from Coastal Zone Color Scanner observations. In : E.G.S. XIX General Assembly, Grenoble, 25-29 Avril 1994. Annales Geophysicae, supplément au volume 12, p. 351.

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5. Morel, A., M. Babin, D. Antoine, and Y. Dandonneau, 1995. Measured and predicted primary production in oligotrophic environments : achievements and problems in view of a generalization. “Structure and dynamics of oligotrophic ecosystems : evolution of concepts”. Symposium organized by the Research Group GRD 869 “Productivity of oligotrophic oceanic systems“. 12-13 Janvier 1995, Villefranche sur Mer.
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 8. Antoine D. and A. Morel, 1996. Ocean color, primary production models, and the carbon cycle : achievements and limitations. In : E.G.S. XXI General Assembly, La Haye, les 6-10 Mai 1996.
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 14. Antoine D., 1999. CASI operations carried out during Coastloc, interim meeting of the E&C DGXII “Coastloc” program, Villefranche sur mer, Janvier 1999.
 15. Antoine D., 1999. MERIS level 2 algorithms, Development, prototyping, and validation, ESTEC final meeting, ESTEC, Noordwijk, Pays-Bas, 24-25 February 1999.
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