Curriculum Vitae

Name	Zouhair Lachkar
Date and Place of Birth	April 21, 1978; Meknes, Morocco
Nationality	Moroccan
Address	Office 1121, A2, NYUAD Saadiyat campus, PO 129188, Abu Dhabi, UAE.
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Education

2007	Ph.D.	Global eddy-permitting simulation of CO_2 in the ocean, University Pierre & Marie Curie, Paris, France
2002	M.Sc.	Atmosphere, Ocean & Environment, University Paul Sabatier, Toulouse, France
	M.Eng.	Meteorology, National School of Meteorology (ENM), Toulouse, France
	M.Eng.	Meteorology & Environment, Hassania institute of Civil Engineering (EHTP), Casablanca, Morocco
1998	CPGE	Preparatory school to the French Grandes Ecoles, Fez, Morocco

Professional Experience

2014-	Senior scientist, Center for Prototype Climate Modeling, New York University Abu Dhabi, Abu Dhabi, UAE.
Aug - Dec 2014	Visiting scientist, Courant Institute of Mathematical Sciences, New York University, NY, USA.
2010-2014	Senior researcher (oberassistent), Environmental Physics, ETH Zurich, Zurich, Switzerland.
2007-2010	Postdoctoral Fellow, Environmental Physics, ETH Zurich, Zurich, Switzerland
2003-2007	Research Assistant, Laboratoire des Sciences du Climat et de l'Environnement (LSCE), Saclay, France.
2002-2003	Operational Meteorologist, Moroccan Weather Service, Casablanca, Morocco
2002	Research Assistant, Laboratoire d'Oceanographie et du Climat: Experimentation et Approches Numeriques (LOCEAN, ex-LODYC), Paris, France.
2001	Research Assistant, National Centre for Meteorological Research (CNRM), France

Main Areas of Research

Ocean circulation & Climate; Mesoscale eddies; Marine biogeochemistry under climate change.

Awards and Recognition

2014 Keynote speaker, 46th International Liège Colloquium on Ocean Dynamics, Liège, Belgium
2014 session co-chair, Open Science Conference, Bergen, Norway
2013 Swiss NSF grant (co-PI), project N 200021_149384, US$450 000
2013 Invited speaker at the Gordon Research Conference on Coastal Circulation, UNE, Maine
2010 Best young scientist award at IMBER IMBIZO II, Crete.
2003 CEA Fellowship from the French Atomic Energy Authority, awarded for Ph.D. research project.
2000 BGF award , French Government excellence scholarship.
Regular reviewer for international research journals (Nature, Geophysical Research Letters, Deep Sea Research, Progress in Oceanography,...) and research proposals (NSF, NOAA, French ANR,..).

Schools and Courses

2008	NCCR summer school: “Key challenges in climate variability and change”, Monte Verita, Ticino, Switzerland
2006	CARBOOCEAN summer school: “Modeling of the marine carbon cycle from small to global scale”, Bergen, Norway.
2004	GODAE summer school: “Ocean Weather Forecasting: An Integrated View of Oceanography”, Toulon, France.

Professional Society Membership

Member, European Geosciences Union, since 2006
Member, American Geophysical Union, since 2005
Member, American Society of Limnology and Oceanography, since 2009

Teaching and Mentoring Experience

Feb 2015	Lecturer at NIO winter school for marine biogeochemical modeling, Goa, India
2012-2014	Coordinator of “Systems Analysis”, Environmental Sciences Department, ETH Zurich, [Bachelor Level]
2010-2012	Tutor/Lecturer for “Global Biogeochemical Cycles and Climate”, Environmental Science Department, ETH Zurich, [Master Level]
2009-2012	Tutor for “Term paper in Biogeochemistry and Pollutant Dynamics”, Environmental Sciences Department, ETH Zurich, [Master Level]
2010-2015	Supervisor of 4 Master thesis projects; co-Supervisor of 2 PhD thesis projects

Journal Publications (peer reviewed)

Lachkar, Z., Smith, S. and M. Levy, Intensification and deepening of the Arabian Sea Oxygen Minimum Zone in response to increase in Indian monsoon wind intensity, in preparation.

Al Azhar, M., **Lachkar, Z**., Levy, M. and Smith, S.: Oxygen minimum zone contrasts between the Arabian sea and Bay of Bengal implied by differences in remineralization depth, in preparation.

Lovecchio, E., Gruber, N., Münnich, M., and **Lachkar, Z**.: On the long-range offshore transport of organic carbon from the Canary Upwelling System to the open North Atlantic, Biogeosciences Discuss., doi:10.5194/bg-2016-548, in review, 2017.

Lachkar, Z., S. Smith M. Levy and O. Pauluis (2016): Eddies reduce denitrification and compress habitats in the Arabian Sea, Geophysical Research Letters, doi: 10.1002/2016GL069876

Turi, G., N., Gruber, **Z., Lachkar** and M. Münnich (2016): Climatic modulation of recent trends in ocean acidification in the California Current System, Environmental Research Letters, doi:10.1088/1748-9326/11/1/014007

Nagai, T., N. Gruber, H. Frenzel, **Z. Lachkar**, J. C. McWilliams and G.-K. Plattner (2015): Dominant role of eddies and filaments in the offshore transport of carbon and nutrients in the California Current System, Journal of Geophysical Research Oceans, doi: 10.1002/2015JC010889.

Levin, L., Liu, K.-K.. Emeis, K.-C., Breitburg, D.-L., Cloern,J., Deutsch ,C., Giani, M., Goffart, A., Hofmann, E. E., **Lachkar, Z**. et al., Comparative biogeochemistry–ecosystem–human interactions on dynamic continental margins, Journal of Marine Systems, doi:10.1016/j.jmarsys.2014.04.016

Fendereski, F., M. Vogt, M. R. Payne, **Z. Lachkar**, N. Gruber, A. Salmanmahiny, and S. A. Hosseini (2014): Biogeographic classification of the Caspian Sea, Biogeosciences, 11, 6451-6470, doi:10.5194/bg-11-6451-2014.

Lachkar, Z. (2014): Effects of upwelling increase on ocean acidification in the California and Canary Current systems, Geophysical Research Letters, doi: 10.1002/2013GL058726

G. Turi, **Lachkar, Z.** and Gruber., N.: "Spatiotemporal variability and drivers of pCO2 and air-sea CO2 fluxes in the California Current System: An eddy-resolving modeling study", Biogeosciences, 11, 671-690, doi:10.5194/bg-11-671-2014.

Salihoglu, B., Neuer, S., Painting, S., Murtugudde, R., Hofmann, E. E., Steele, J. H., Hood, R. R., Legendre, L., Lomas, M. W., Wiggert, J., Ito, S., **Lachkar, Z**., Hunt, G., Drinkwater, K. F, Sabine, C. L. (2013): Bridging marine ecosystem and biogeochemistry research: Lessons and recommendations from comparative studies, J. Mar. Syst., Volumes 109–110, Pages 161-175, 2013.

Lachkar, Z., and N. Gruber (2013), Response of biological production and air-sea CO_2 fluxes to upwelling intensification in the California and Canary Current Systems, J.Mar. Syst., Volumes 109–110, Pages 149-160, doi:10.1016/j.jmarsys.2012.04.003, 2013.

Hauri, C., Gruber, N., Vogt, M., Doney, S. C., Feely, R. A., **Lachkar, Z.**, Leinweber, A., McDonnell, A. M. P., Munnich, M., and Plattner, G.-K. (2013) Spatiotemporal variability and long-term trends of ocean acidification in the California Current System, Biogeosciences, 10, 1-21, 2013.

Lachkar, Z., and Gruber. N.: A comparative study of biological production in eastern boundary upwelling systems using an artificial neural network, Biogeosciences, 9, 293-308, 2012.

Gruber, N., **Z. Lachkar**, H. Frenzel, P. Marchesiello, M. Münnich, J. C. McWilliams, T. Nagai, and G.-K. Plattner, Eddy-induced reduction of biological production in eastern boundary upwelling systems, Nature Geoscience, 4, 11, 787-792, doi:10.1038/ngeo1273, 2011.

Lachkar, Z., and Gruber., N., What controls biological production in coastal upwelling systems? Insights from a comparative modeling study, Biogeosciences, 8, 2961-2976, 2011.

Lachkar, Z., Orr, J.C., Dutay, J.C., and Delecluse, P., On the role of mesoscale eddies in the ventilation of Antarctic Intermediate Water, Deep Sea Research I, vol 56, 6, 909-925, 2009.

Lachkar, Z., Orr, J.C. and Dutay, J.C, Seasonal and mesoscale variability of oceanic transport of anthropogenic CO_2, Biogeosciences, 6, 2509-2523, 2009.

Leloup, J., **Lachkar, Z.**, Boulanger, J. P., and Thiria, S., Detecting decadal changes in ENSO using neural networks, Climate Dynamics, Vol 28, 2-3, 147-168, doi:s00382-006-0173-1, 2007

Lachkar, Z., Orr, J.C., Dutay, J.C., and Delecluse, P., Effect of mesoscale eddies on global ocean distributions of CFC-11, C-14, and CO2, Ocean Science, 3, 461-482, 2007

Other Relevant Publications (not peer reviewed)

Z. Lachkar and N. Gruber: "Exploring the Future Evolution of Multiple Stressors in Eastern Boundary Upwelling Systems", Ocean Carbon and Biogeochemistry News, vol 5, N2, 2012.

S. Alin, S. Siedlecki, B. Hales, J. Mathis, W. Evans, M. Stukel, G. Gaxiola-Castro, J. M. Hernandez-Ayon, L. Juranek, M. Goñi, G. Turi, J. Needoba, E. Mayorga, **Z. Lachkar**, N. Gruber, J. Hartmann, N. Moosdorf, R. Feely, F. Chavez :"Coastal Carbon Synthesis for the Continental Shelf of the North American Pacific Coast (NAPC): Preliminary Results", Ocean Carbon and Biogeochemistry News, vol 5, N1, 2012.

Z. Lachkar and N. Gruber: "Biological Production Response to Coastal Upwelling Intensification: Insights from a Comparative Modeling Study", IMBER Update Issue 16 , 2010.

Z. Lachkar, "Rôle des tourbillons de méso-échelle océaniques dans les flux air-mer de CO2 anthropique à l'échelle globale", Thèse de l'université Paris 6 Pierre et Marie-Curie, 2007.

J.-M. Molines, A.M. Treguier, B. Barnier, L. Brodeau, J. Le Sommer, G. Madec, T. Penduff, S. Theetten, Y. Drillet, C. Talandier, J. Orr, and **Z. Lachkar,** "Le modèle DRAKKAR de la variabilité océanique globale, 1958-2004", IDRIS Newsletter, 2006.

Z. Lachkar, "Classification des évènements El Nino par des méthodes neuronales", Mémoire d'Ingenieur, Ecole Nationale de la Météorologie et Université Paul Sabatier - Toulouse III, 2002.

International Conferences

Z. Lachkar, S. Smith, M. Levy, “Effects of mesoscale eddies on the dynamics of the Arabian Sea oxygen minimum zone”, GRC conference on ocean biogeochemistry, Jun 2016, Hong Kong.

Z. Lachkar, S. Smith, M. Levy, O. Pauluis, “Effects of mesoscale eddies on suboxia and hypoxia in the Arabian Sea”, Ocean Sciences Meeting, Feb 2016, New Orleans, USA.

Z. Lachkar, S. Smith, M. Levy, O. Pauluis, “Eddies deepen suboxia and reduce denitrification in the Arabian Sea”, Indian Ocean Symposium, Dec 2015, Goa, India.

Z. Lachkar, “Exploring the dynamics of the Arabian Sea oxygen minimum zone in O2 coordinates ”, Workshop on thermodynamic analysis for atmospheric and oceanic flows, Jan. 2016, Abu Dhabi, UAE.

Z. Lachkar, “Introduction to marine bioegeochemical modeling”, Feb. 2015, NIO winter school, Goa, India.

Z. Lachkar, “Effects of Climate Forcing on Ocean Acidification and De-oxygenation in Eastern Boundary Upwelling Systems: Insights from Regional Eddy-Resolving Simulations”, Seminar at Princeton University, Sep. 2014, USA.

Z. Lachkar, “The evolution of multiple stressors in the Canary upwelling system over the 21st century”, IMBER Future Oceans Conference, Jun. 2014, Bergen, Norway.

Z. Lachkar, “Eastern Boundary upwelling systems (EBUS) as natural SOLAS laboratories”, Keynote talk at the 46th International Liège Colloquium on Ocean Dynamics, May 2014, Liège, Belgium

Z. Lachkar, “Cross shelf exchange of carbon, nitrogen and oxygen in Eastern Boundary Upwelling Systems”, Gordon Research Conference on coastal ocean circulation, Jun. 2013, Biddeford, ME, USA

Z. Lachkar and N. Gruber, “Modeling multiple stressors in eastern boundary upwelling systems”, IMBIZO-3 meeting, 30 January 2013, Goa, India.

Z. Lachkar and N. Gruber, “The future evolution of multiple stressors in eastern boundary upwelling systems”, SOLAS MTS Workshop, 27 November 2012, Lima, Peru.

Z. Lachkar, “How do ocean mesoscale eddies affect biogeochemical processes? Insights from model simulations and satellite observations”, SOLAS MTS Workshop, 28 November 2012, Lima, Peru.

Z. Lachkar and N. Gruber, “The future coastal ocean: the impact of increased stratification on biological production and carbon cycling”, EGU General Assembly 2012, Vienna, Austria.

Z. Lachkar and N. Gruber, “The future of coastal upwelling ecosystems: the impact of potential wind changes on ocean acidification and coastal hypoxia”, EGU General Assembly 2012,Vienna, Austria.

Z. Lachkar, N. Gruber, and G. Turi: “The future of eastern boundary upwelling systems: potential changes and vulnerabilities”, ASLO Aquatic Sciences Meeting, San Juan, Puerto Rico, Feb. 2011

Z. Lachkar and N. Gruber “Biological production response to coastal upwelling intensification: insights from a comparative modeling study”, IMBER IMBIZO2 meeting, Crete, Greece, Oct. 2010

Z. Lachkar, N. Gruber and C. Hauri “Carbon and nutrient recycling in Eastern Boundary Upwelling Systems”, Ocean Sciences Meeting, Portland, OR, USA, Feb. 2010

Z. Lachkar, N. Gruber and G. K. Plattner: “Modeling the coastal carbon cycle with an emphasis on Eastern Boundary Upwelling Systems”,Coastal Carbon Cyc. Workshop, Paris, France, Jun. 2009

Z. Lachkar, N. Gruber, G. –K. Plattner, and C. Hauri: “Coastal upwelling systems under changing climate and high CO2”, EGU General Assembly 2009, Vienna, Austria, Apr. 2009

Z. Lachkar, N. Gruber, G. –K. Plattner, and C. Hauri: “The future coastal ocean: the impact of acidification and wind changes on coastal productivity and carbon cycling”, ASLO Aq. Sc. Meeting, Nice, France, Jan. 2009

Z. Lachkar, N. Gruber, G. –K. Plattner, and F. Hartmut:” Can eddies alter the response of productivity in EBCs to increases in upwelling favorable winds?”, 2008 ROMS European workshop, Grenoble, France, Oct. 2008

Z. Lachkar, N. Gruber, G. K. Plattner, and D. Loher: « Biological productivity in Eastern Boundary Current systems: a comparative study », Eastern Boundary Upwelling Ecosystems Symposium, Gran Canaria, Jun. 2008

Z. Lachkar, N. Gruber, G. K. Plattner, and D. Loher: « What controls biological productivity in Eastern Boundary Current systems?», Ocean Sciences Meeting 2008, Orlando, Florida, Mar. 2008

Z. Lachkar, N. Gruber, G. –K. Plattner, and D. Loher : ”Coastal biogeochemical processes and ocean carbon cycling in Eastern Boundary Current systems”, EURO-OCEAN 2007 Upwelling Systems Workshop, Santiago de Compostella, Spain, Oct. 2007

Z. Lachkar, N. Gruber, G. –K. Plattner, and F. Hartmut: ”Biological productivity in Eastern Boundary Current systems: the Canary vs the California Current system”, 2007 ROMS/TOMS users workshop, UCLA, Los Angeles, Oct. 2007

Z. Lachkar, J.C. Orr, J.C. Dutay, and P. Delecluse: ”Antarctic Intermediate Water Formation and Anthropogenic CO2 Uptake”, EGU General Assembly, Vienna, Austria, Apr. 2007

Z. Lachkar, J.C. Orr, J.C. Dutay, and P. Delecluse: ”Role of mesoscale eddies in ocean global distributions of CFC-11,C14, and CO2”, Seminar at IFM-GEOMAR, Kiel, Germany, Sept. 2006

Z. Lachkar, J.C. Orr, J.C. Dutay, and P. Delecluse: ”High resolution modelling of marine carbon cycle”, Seminar at the Swiss Federal Institute of Technology, Zurich, Switzerland, Aug. 2006

Z. Lachkar, J.C. Orr, J.C. Dutay, and P. Delecluse: ”Effect of ocean mesoscale eddies on global distributions of CFC-11, C-14, and CO2”, EGU General Assembly, Vienna, Austria, Apr. 2006

Z. Lachkar, J.C. Orr, J.C. Dutay, and P. Delecluse: “Role of Ocean Mesoscale Eddies in Global-scale Uptake, Storage, and Meridional Transport of CFC-11, Bomb-C14, and Anthropogenic CO2”, AGU Ocean Sciences Meeting, Honolulu, Hawaii, Feb. 2006

Z. Lachkar, J.C. Orr, J.C.: “Importance of eddies in absorption and transport of CFC-11 & C-14”, 3 rd DRAKKAR meeting, Grenoble, France, Jan. 2006

Z. Lachkar, J.C. Orr, J.C.: “Tracers in OPA9 model”, DRAKKAR meeting, Grenoble, France, 2005

Z. Lachkar, J.C. Orr, J.-C. Dutay: “CFC-11 simulations in the global model ORCA05: preliminary results”, DRAKKAR meeting, Kiel, Germany, Sept. 2004

Z. Lachkar, S. Thiria, J.-P. Boulanger, and C. Menkes: “Classifying El Nino and La Nina events using the Kohonen maps”, AMS 3rd Conference on Artificial Intelligence Applications to the Environmental Sciences, February, Long Beach, CA, Feb. 2003.

Other Skills & Competencies

Languages:	Arabic (mother tongue), English (fluent), French (fluent), German (basic)
Computer Science:	Fortran77/90, Matlab, Ferret, R, Unix/Linux
Mathematical Modeling: networks,	Numerical Modeling (e.g., ROMS, NEMO), Machine Learning (e.g., neural self-organizing maps), Lagrangian Modeling, Dynamical Systems Theory