Amala Mahadevan

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Research Interests Physical oceanography, ocean biogeochemistry, the carbon cycle, ocean's role in climate, environmental fluid mechanics and numerical modeling.

Appointments

Woods Hole Oceanographic Institution, Department of Physical Oceanography
- Senior Scientist 2013 - present
- Associate Scientist with Tenure 2011 - 2013

Harvard University, Mather House
- Faculty Dean 2017- present

MIT, Department of Earth, Atmospheric and Planetary Sciences
- Affiliate - Joint Program w. Woods Hole 2011 - present

University of Massachusetts Dartmouth
- Adjunct, School of Marine Science and Technology 2011 - present
- Adjunct, Department of Physics 2007 - 2011

Boston University, Department of Earth Sciences
- Research Professor 2011
- Associate Research Professor 2003 - 2011

Harvard University, Division of Engineering and Applied Sciences
- Visiting Associate Professor 2003 - 2006

University of New Hampshire, Institute for the Study of Earth Oceans and Space
- Assistant Research Professor 2001 - 2003

University of Cambridge, Department of Applied Mathematics and Theoretical Physics
- Senior Research Associate 2001 - 2003

Atmospheric and Environmental Research, Inc., Cambridge, MA
- Staff Scientist / Senior Research Associate 1999 - 2001

Harvard University, Department of Earth & Planetary Sciences
- Research Associate 1997 - 1998

University of Chicago, Department of Geophysical Sciences
- Postdoctoral Research Associate 1994 - 1997

Stanford University, Environmental Fluid Mechanics Lab. and Scientific Computing & Computational Mathematics Program
- Research Assistant 1987 - 1994

Professional Preparation

Stanford University
Environmental Fluid Mechanics, Scientific Computing and Computational Mathematics
Ph.D. 1995
Engineer's Degree 1990
M.S. 1988

VJTI, University of Bombay, India — Batchelor's Civil Eng. 1987

Honors

WHOI Arnold B. Arons Award for excellence in teaching, advising, and mentoring 2020
MIT Frank E. Perkins Award 2019
for Excellence in Graduate Advising in the School of Science
Woods Hole Oceanographic Institution Doherty Chair, 2016 - 2017
Radcliffe Inst. for Advanced Study, Harvard University Fellow 2014 - 2015
Université Pierre et Marie Curie, Paris Visiting Professor 2010 - 2011
Downing College, University of Cambridge Darley Fellow 2002 - 2003

Service / Committees

Faculty dean leadership council, Harvard University 2020 - present
Chair, Joint Committee for Physical Oceanography, WHOI/MIT 2022 - present
Equity diversity and inclusion committee, PO Department, WHOI 2020 - present
Chair, International Scientific Council ISblue, France 2019 - present
Scientific Advisory Board, Jupiter Foundation 2019 - present
Scientific Board, Science for the Public 2019 - present
Member, Joint Committee for Physical Oceanography, WHOI/MIT 2017 - 2019
Postdoctoral Coordinator, Physical Oceanography, Woods Hole 2012 - 2016
ONR, Steering committee 2017 - present
Research Initiative on Coherent Lagrangian Pathways from Surface Ocean to Interior
ONR, Steering committee 2016 - present
Research Initiative on Monsoon Intra-seasonal Oscillations
ONR, Steering committee 2011 - 2016
Research Initiative on Air-Sea Interactions in the Northern Indian Ocean
Future of Climate Process Teams, Steering Committee 2015 - 2017

Editing / Reviewing

Editorial board, Limnology and Oceanography Letters 2022-present
Guest editor, Oceanography Magazine: Special Issue From Monsoons to Mixing June 2016
Guest editor, Oceanography Magazine: Special Issue From Monsoons to Mixing June 2016
Guest editor, Ocean Dynamics, Special Issue on Submesoscale processes 2017
Reviewing for JGR, GRL, JPO, DAO, JMR, DSR, RSE, Ocean Model. MEPS, Oc. Dyn, Biogeosciences, Prog. Oceanogr, Nature, Nature Communications, Science, etc.

Organizing Role

Liege Colloquium on Submesoscale processes 2016
ONR, DRI Workshops, CALYPSO. ASIRI and MISO 2011- present
Radcliffe workshop: Life in a turbulent environment 2015
Radcliffe public symposium on the Changing Oceans 2016
Ocean Sciences Meeting, Session coordinator 2010, 2012,2020

Courses Taught

Submesoscale Ocean Processes MIT/WHOI, 12.950, Fall 2022
Small-scale ocean processes:
Waves, instabilities, turbulence MIT/WHOI 12.802 Spring 2021
Introduction to Physical Oceanography MIT/WHOI 12.808 Fall 2020
Fluid Dynamics of the Ocean and Atmosphere MIT/WHOI, 12.800, Fall 2017, ’18, ’19

Seminar on Submesoscale Processes	MIT/WHOI, 12.S992, Spring	2017
Computational Ocean Modeling	MIT/WHOI, 12.850	2013,'15,'18,'20,22
Climate Change, Past, present, future	Harvard University, FS25y	2005
Environmental Hydrodynamics & Hydrology	Harvard University, ES162	2004
Applied Mathematics A	Harvard University, AM 21A	2003,'04
Applied Mathematics B	Harvard University, AM 21B	2004,'05

Summer and Other Teaching

Workshop, Woods Hole, Writing a Better Scientific Proposal	Annually 2012 - present
Geophysical Fluid Dynamics Summer Program, Woods Hole, Staff	2003,'04,'07,'08, '10,'15
Chinese Academy of Sciences, South China Institute of Oceanology	2018
Danish Technical University, Lecturer, Summer school Complex Motion in Fluids	2011
Grand Combin Italy, Summer Program, Transport in Geophysical Flows: Ten Years After	2004

Visiting / Summer Positions

Dept. of Integrative Biology, U.C. Berkeley, Visiting Scientist	2007
Laboratoire d'Oceanographie Dynamique et de Climatologie, U. Pierre et Marie, Paris	1998,'01
MIT, Department of Earth, Atmospheric and Planetary Sciences, Visiting Scientist	1997 - 1999
Woods Hole Oceanographic Institution, Visiting Investigator	1998
National Center for Supercomputing Applications, Atmospheric Sciences, Visitor	1994 - 1995

Fieldwork

CALYPSO, ONR-cruise, *Pourquoi Pas?*, Balearic Sea, co-Chief Scientist 2022

CALYPSO, ONR-cruise, *Pourquoi Pas?*, W. Mediterranean, co-Chief Scientist 2019

CALYPSO, ONR-cruise, *NRV Alliance*, W. Mediterranean, co-Chief Scientist 2018

IRENE - Cruise with IMEDEA/SOCIB in the Mediterranean, July 2017

Baltic SubEx fieldwork with Helmholtz Institute, Germany, participated. 2016

ONR Cruise, Bay of Bengal, *R/V Revelle*, 'ASIRI' program, Aug-Sep 2015
Upper ocean process studies, autonomous platforms and ship-based sampling

ONR Cruise, Bay of Bengal, *R/V Revelle*, 'ASIRI' program, Nov-Dec 2013
Co-chief scientist, Survey of upper ocean structure and biogeochemical sampling

DOE project, Tidal wetlands in Georgia, w. Hughes, FitzGerald, Pennings 2009

Postdocs

Leo Middleton, Postdoc Investigator, Woods Hole Oceanographic Institution	2021 - present
Alex Kinsella, Postdoc Investigator, Woods Hole Oceanographic Institution	2021 - present
Yue (Cynthia) Wu, Postdoc Investigator, Woods Hole Oceanographic Institution	2019 - 2021
Jim Thomas, Postdoc Scholar, OFI-Dal &Woods Hole Oceanographic Institution	2019 - 2019
Mathieu Dever, Postdoc Investigator, Woods Hole Oceanographic Institution	2017 - 2019
Kate Lowry, Postdoc Scholar, Woods Hole Oceanographic Institution	2016 - 2018
Melissa Omand, Postdoc Investigator, Woods Hole Oceanographic Institution	2011 - 2014
Mariona Claret, Postdoc Investigator, Woods Hole Oceanographic Institution	2013 - 2014
Jean-Baptiste Gilet, Postdoc Investigator, Woods Hole Oceanographic Institution	2012 - 2013
Jinbo Wang, Postdoc Investigator, Woods Hole Oceanographic Institution	2011 - 2012
Gualtiero Badin, Postdoctoral Research Associate, Boston University	2010 - 2011
Jacqueline Tweddle, Postdoctoral Research Associate, Boston University	2009 - 2010
Bror Jonsson, Postdoctoral Research Associate, Boston University	2006 - 2008

Graduate Students

Helena Cheslack, MIT/WHOI Joint Program (Navy masters)	2021 - present
Katy Abbott, MIT/WHOI Joint Program	2020- present
Weiguang (Roger) Wu, MIT/WHOI Joint Program	2020- present
Jing He, Ph.D. student, MIT/WHOI Joint Program	2017- present
Guilherme Salvador Vieira, Ph.D. (co-advised) Northeastern University	2019- 2021
Mara Freilich, Ph.D. MIT/WHOI Joint Program	2015 - 2021
Gualtiero Spiro Jaeger, Ph.D. MIT/WHOI Joint Program	2013 - 2019
Sebastian Essink, Ph.D. MIT/WHOI Joint Program	2013 - 2019
B. Cael Barry, Ph.D. student, MIT/WHOI Joint Program, co-advised	2014 - 2016
Samantha Siedlecki, PhD, University of Chicago, Co-advised	2004 - 2010

Summer/ Guest Students supervised

Anjali Shah (Guest student, 2022), Yoana Guzman (Summer student fellow 2020), Guilherme Salvador (Guest student, summer 2019), Margaret Conley (Guest investigator, spring 2019), Daniel Tarry (Guest student, Fall 2018), Eugenio Cutolo (Guest student, Fall 2018) Yenchia Feng (Guest student, summer 2017), Kendra Lynn (Summer student fellow 2016), Qi Li (GFD Fellow, 2016), Sarah Brody (Guest 2014), Sebastian Essink (Guest 2012-13), Lauren Dana (Guest 2013, 2014 summer), Lenna Quackenbush (Guest, Fall 2013), Marcel du Plessis (Guest, Fall 2013, Spring 2015, Spring 2017), Mara Freilich (Summer student fellow 2014)

Student Committees

Lexi Jones, PhD Committee, MIT-WHOI Joint Program	2021 - present
Michael Dotzel, PhD Committee, MIT-WHOI Joint Program	2021 - present
Guilherme Salvador, PhD, Northeastern University	2020 - 2021
Margaux Fillipi, PhD, MIT	2017 - 2019
Chair, General Exam Committee, Physical Oceanography, MIT/WHOI	2016, 2021
Chair, PhD Defense, Kelly Anne Ogden, Jay Brett, Deepa Rao MIT/WHOI	2016, ’18, ‘20
David Fronk, PhD student, Harvard University	2016 - 2017
Emily Zakem, PhD student, MIT	2013 - 2016
Deepak Cherian, PhD, MIT/WHOI	2012 - 2016
Sonaljit Mukherjee, PhD, Univ. Mass Dartmouth	2010 - 2016
Sudip Majumder, PhD, Univ. Mass Dartmouth	2010 - 2015
Sophie Clayton, PhD, MIT/WHOI	2008 - 2012
Xianqin Yao, M.S., Univ. Mass Dartmouth	2010 - 2011
Eric Holmes, M.S., Univ. Mass Dartmouth	2009 - 2010
Deborah Schwartz, M.S., Univ. Mass Dartmouth	2009 - 2011
Danielle Tinkham, M.S., Univ. Mass Dartmouth	2006 - 2007

Research Support

ONR, Ocean mesoscale and submesoscale vertical motion in the Balearic Sea (PI)	2021 - 2023
NASA, EVS-3 Submesoscale ocean dynamics and vertical transport (co-I)	2019 - 2023
NASA, Predicting source depth & productivity in coastal upwelling regions (PI)	2019 - 2022
NSF, Internal Lee-Wave Dissipation in Oceanic Flows with Mean Shear (co-I)	2018 - 2022
ONR, Process Studies for Monsoon Intra-seasonal Oscillations (PI)	2017 - 2021
ONR, Frontogenesis and subduction at the Alboran front (PI)	2016 - 2020

NASA, Modeling studies for EXPORTS in a dynamic environment (PI) 2016 - 2018
ONR, Early student support: Freshwater effects on air-sea fluxes (PI) 2016 - 2019
NASA, Participation of US scientists in the 48th Liege colloquium on Ocean Dynamics: Submesoscale processes (PI) 2016
ONR, Physical-Biogeochemical Synthesis of the Northern Indian Ocean from Synthetic Aperture Radar and Satellite Remote Sensing Data (PI) 2015 - 2018
NSF, Role of mixed layer eddies in seasonally variable regimes (PI) 2014 - 2017
NSF, Eddy-driven subduction of particulate carbon during the North Atlantic Spring bloom (PI) 2013 - 2014
ONR, Submesoscale studies for the Air-sea interaction regional initiative (PI) 2013 - 2016
ONR, Early student support for process studies of freshwater dispersal (PI) 2012 - 2015
ONR, Role of Bay of Bengal for Prediction of the Indian Monsoon (PI) 2011 - 2012
NSF, Biophysical alteration of wetland geomorphology in response to rising sea level (co-I) 2011 - 2014
NASA, Interpreting the ocean's interior from surface data (PI) 2010 - 2014
DOE, Response of coastal wetlands to sea-level rise (co-I) 2010 -2012
NSF, On the importance of submeso-scale processes to ocean productivity (PI) 2009 - 2012
NSF, Impacts of changing seasonality of wind-driven mixing on the Arctic (co-I) 2009 - 2012
ONR, Scalable lateral mixing and coherent turbulence (PI) 2008 - 2013
NSF, A modeling study of mixed layer processes underlying the North Atlantic bloom (co-I) 2009 - 2009
ONR, From stirring to mixing: submesoscale routes to lateral dispersal of tracers in the ocean (PI) 2008 - 2009
NASA, Lagrangian tracking of satellite products with a numerical model for biological production (PI) 2008 - 2011
DOE, Dissection of platform marshes by ecophysical processes in response to sea-level rise (co-I) 2007 - 2008
NSF, Effect of submesoscale processes on property fluxes and distributions in the upper ocean (PI) 2006 - 2009
NOAA, A biogeochemical synthesis of coastal waters based on modeling, satellite & field observations (co-I) 2005 - 2008
NSF, A parameterization of shallow waters in global ocean carbon cycle models (co-I)2003 - 2006
NASA, Air-sea flux of CO_2: Effects of small-scale variability on large-scale estimates (PI)2001 - 05
ONR, Modeling studies of the shelfbreak front (PI) 1999 - 2001

Publications

Author Convention: AM is last author on papers co-authored with students or postdocs.

Submitted

He, Jing and A. Mahadevan, Vertical velocity diagnosed from surface data with machine learning

Strauss, Jan, Chang Jae Choi, Jonathan Grone, Fabian Wittmers, Valeria Jimenez, Kriste Makareviciute-Fichtner, Charles Bachy, Gualtiero Spiro Jaeger, Camille Poirier, Charlotte Eckmann, Carolin R. Löscher, VVSS Sarma, Amala Mahadevan and Alexandra Z. Worden, The Bay of Bengal exposes abundant photosynthetic picoplankton and newfound diversity along salinity-driven gradients.

Freilich, Mara, C. Poirier, M. Dever, E. Alou-Font, J. Allen, A. Cabornero, L. Sudek, C.J. Choi, S. Ruiz, A. Pascual, J.T. Farrar, T.M. S. Johnston, E.A. D'Asaro, A.Z. Worden, A. Mahadevan, Microbially enriched intrusions deliver carbon from the photic to mesopelagic zone in a subtropical ocean.

Esposito, Giovanni, Sebastien Donnet, Maristella Berta, Andrey Scherbina, Mara Freilich, Luca Centurioni, Eric D'Asaro, J. Thomas Farrar, T. M. Shaun Johnston, Amala Mahadevan, Tamay Özgökmen, Ananda Pascual, Pierre-Marie Poulain, Simón Ruiz, Daniel R. Tarry Annalisa Griffa, Inertial oscillations and frontal instabilities at an Alboran Sea front: Effects on divergence and vertical transport

Plummer, A., M. Freilich, R. Benzi, C J Choi, L. Sudek, A. Z. Worden, F. Toschi, A. Mahadevan . Oceanic frontal divergence alters phytoplankton competition and distribution

Vieira, Guilherme S., Michael R. Allshouse and Amala Mahadevan, Seagrass deformation affects fluid instability and tracer exchange in canopy flow

2023

82. Jönsson, B.F., J.E. Salisbury, E.C. Atwood, S. Sathyendranath, A. Mahadevan, Dominant timescales of variability in global satellite chlorophyll and SST revealed with a MOving Standard deviation Saturation (MOSS) approach, 2023, Remote Sensing of Environ., 286, 113404, doi: 10.1016/j.rse.2022.113404

81. Aravind, H.M., V. Verma, S. Sarkar, M.A. Freilich, A. Mahadevan, P.J. Haley, P.F.J. Lermusiaux, M.R. Allshouse, Lagrangian surface signatures reveal upper-ocean subduction near oceanic density fronts, **2023**, Ocean Modelling, **181**, 102136, doi:10.1016/j.ocemod.2022.102136

2022

80. Wu, Y., E.Kunze, A. Tandon and A. Mahadevan, Reabsorption of lee-wave energy in bottom-intensified abyssal currents, 2022, *J. Phys. Oceanogr.* doi: 10.1175/JPO-D-22-0058.1

79. Simoes-Sousa, Iury T, Amit Tandon, Caue Zirnberger Lazaneo and Amala Mahadevan, Mixed layer eddies supply nutrients to augment the spring phytoplankton bloom, 2022, *Frontiers in Mar. Sci.,* doi: 0.3389/fmars.2022.825027

78. Cutolo, E., A. Pascual, S. Ruiz, T.M.S. Johnston, M. Freilich, A. Mahadevan, A. Shcherbina, P-M Poulain, T. Ozgokmen, L.R. Centurioni, D.L. Rudnick and E.A. D'Asaro, Diagnosing frontal dynamics from observations using a variational approach, 2022, *J. Geophys. Res.* doi:10.1029/2021JC018336

77. Tarry, Daniel R, Simon Ruiz, T. M. Shaun Johnston, Pierre-Marie Poulain, Tamay M. M. Ozgokmen, Luca R. Centurioni, Maristella Berta, Giovanni Esposito, J. Thomas Farrar, Amala Mahadevan, Ananda Pascual, Drifter observations reveal intense vertical velocity

in a surface ocean front, *Geophysical Research Letters,* 2022, doi.org/ 10.1029/2022GL098969

76. Essink, Sebastian, Verena Hormann, Luca Centurioni and Amala Mahadevan, 2022. On characterizing ocean kinematics from surface drifters, 2022, *J. Atmos. Oceanic Tech.*
75. Freilich, Mara, Glenn Flierl and Amala Mahadevan, Diversity of growth rates maximizes phytoplankton productivity in an eddying ocean, G*eophysical Research Letters* (2021): e2021GL096180.
74. Gula, J., J. Taylor, A. Shcherbina and A. Mahadevan, Submesoscale processes and mixing, 2022, In *Ocean Mixing* (pp. 181-214). Elsevier.

2021

73. He, Jing and A. Mahadevan, 2021. How the source depth of coastal upwelling relates to stratification and wind, *Journal of Geophysical Research: Oceans*, 126(12), e2021JC017621.
72. Freilich, M. and Mahadevan, A., 2021. Coherent pathways for subduction from the surface mixed layer at ocean fronts. *Journal of Geophysical Research: Oceans*, *126*(5), p.e2020JC017042.
71. Tarry, Daniel R., S. Essink, A. Pascual, S. Ruiz, P-M Poulain, T. Ozgokmen, L.R. Centurioni, J.T. Farrar, A. Shcherbina, A. Mahadevan and E.A. D'Asaro, Frontal convergence and vertical velocity measured from drifters in the Alborán Sea, 2021, *J. Geophys. Res.* e2020JC016614
70. Dever, M., Nicholson, D., Omand, M.M. and Mahadevan, A., 2021. Size-Differentiated Export Flux in Different Dynamical Regimes in the Ocean. *Global Biogeochemical Cycles*, *35*(3), p.e2020GB006764.

2020

69. Derr, N.J., Fronk, D.C., Weber, C.A., Mahadevan, A., Rycroft, C.H. and L. Mahadevan, Flow-driven branching in a fragile porous medium, 2020, *Phys. Rev. Lett.* 125 *(15), 158002*
68. Mahadevan, A., A. Pascual, D.L. Rudnick, S. Ruiz, J. Tintoré, E. D'Asaro, Coherent pathways for vertical transport from the surface ocean to interior, *Bulletin of the American Meteorological Society (2020) doi:*10.1175/BAMS-D-19-0305.1.
67. Jaeger, Gualtiero Spiro, A.J. Lucas, J.T. Farrar, E. Shroyer, J. Nash, J. MacKinnon, A. Tandon, A. Mahadevan, 2020, Variance of spice in the Bay of Bengal, *J. Phys. Oceanogr.*
66. Omand, Melissa, Rama Govindarajan, Jing He and Amala Mahadevan, A mechanistic model for the sinking flux of particles in the oceans, *Scientific Reports,* 10.1 (2020): 1-16.
65. Dever, Mathieu, Mara Freilich, J. Thomas Farrar, Benjamin Hodges, Tom Lanagan and Amala Mahadevan, EcoCTD for profiling oceanic physical-biological properties from an underway ship, 2020, *J. Oceanic & Atmos. Technology,* doi.org/ 10.1175/JTECH-D-19-0145.1
64. Jaeger, Gualtiero S., A.J. Lucas and Amala Mahadevan, 2020, Formation of Interleaving Layers in the Bay of Bengal, *Deep Sea Research Part II: Topical Studies in Oceanography* 172: 104717

2019

63. Zakem, Emily, Amala Mahadevan, Jonathan Lauderdale, Michael Follows, 2019, Stable aerobic and anaerobic coexistence in anoxic marine zones, *The ISME Journal*, 1-14, doi:10.1038/s41396-019-0523-8
62. Shroyer, E.L., A.L. Gordon, G.S. Jaeger, M. Freilich, A.F. Waterhouse, J.T. Farrar, VVSS Sarma, R. Venkatesan, R.A. Weller, J. Moum and A. Mahadevan, 2019, Upper Layer thermohaline structure of the Bay of Bengal during the 2013 northeast monsoon, *Deep Sea Res II,* doi:10.1016/j.dsr2.2019.07.018
61. Ruiz, Simón, Mariona Claret, Ananda Pascual, Antonio Olita, Charles Troupin, Arthur Capet, Antonio Tovar-Sánchez, John T. Allen, Pierre-Marie Poulain, Joaquín Tintoré, Amala Mahadevan, 2019, Effects of oceanic meso- and submeso-scale frontal processes on the vertical transport of phytoplankton, *J. Geophys. Res.* doi: 10.1029/2019JC015034
60. Essink, Sebastian, Verena Hormann, Luca Centurioni, Amala Mahadevan, Can we detect submesoscale motions in drifter pair dispersion? *J. Phys. Oceanogr.* doi:10.1175/JPO-D-18-0181.1
59. Freilich, Mara and Amala Mahadevan, 2019, Decomposition of vertical velocity for nutrient transport in the ocean, *J. Phys. Oceanogr. 49*(6), 1561-1575.
58. DuPlessis, Marcel, Sebastiaan Swart, Isabelle Jane Ansorge, Amala Mahadevan, Andrew F Thompson, 2019, Southern Ocean seasonal restratification delayed by submesoscale wind-front interactions, *J. Phy. Oceanogr.,* doi:10.1175/JPO-D-18-0136.1

2018

57. Karimpour, F., A. Tandon and A. Mahadevan, 2018, Sustenance of phytoplankton in the subpolar North Atlantic during winter, *J. Geophys. Res.* doi:10.1029/2017JC013639
56. Jaeger, Gualtiero S. and Amala Mahadevan, Submesoscale-selective compensation of fronts in a salinity-stratified ocean, *Science Advances, 4, e1701504 (2018).*
55. Ramachandran, S., A. Tandon, J. Mackinnon, A.J. Lucas, R. Pinkel, A.F. Waterhouse, J. Nash, E. Shroyer, A. Mahadevan, R.A. Weller, and J.T. Farrar, 2018:Submesoscale Processes at Shallow Salinity Fronts in the Bay of Bengal: Observations during the Winter Monsoon. *J. Phys. Oceanogr.,* **48**, 479-509, doi.10.1175/JPO-D-16-0283.1

2017

54. Centurioni, L.R., V. Hormann, L.D. Talley, I. Arzeno, L. Beal, M. Caruso, P. Conry, R. Echols, H.J.S. Fernando, S.N. Giddings, A. Gordon, H. Graber, R.R. Harcourt, S.R. Jayne, T.G. Jensen, C.M. Lee, P.F.J. Lermusiaux, P. L'Hegaret, A.J. Lucas, A. Mahadevan, J.L. McClean, G. Pawlak, L. Rainville, S.C. Riser, H. Seo, A.Y. Shcherbina, E. Skyllingstad, J. Sprintall, B. Subrahmanyam, E. Terrill, R.E. Todd, C. Trott, H.N. Ulloa, and H. Wang. 2017. Northern Arabian Sea Circulation-Autonomous Research (NASCar): A research initiative based on autonomous sensors. *Oceanography,* 30(2):74-87, doi:10.5670/oceanog.2017.224.
53. Olita, Antonio, Arthur Capet, Mariona Claret, Amala Mahadevan, Pierre Marie Poulain, Alberto Ribotti, Simón Ruiz, Joaquín Tintoré, Antonio Tovar-Sánchez, and Ananda Pascual, 2017, Frontal dynamics boost primary production in the summer stratified Mediterranean Sea, *Ocean Dynamics, doi:10.1007/ s10236-017-1058-z*

52. Du Plessis, Marcel, Sebastian Swart, Isabelle Ansorge and Amala Mahadevan, 2017, Submesoscale processes accelerate seasonal restratification in the Subantarctic Ocean, *J. Geophys. Res.*, DOI: 10.1002/2016JC012494

51. Pascual, A., S. Ruiz, A. Olita, C. Troupin, M. Claret, B. Mourre, P.-M. Poulain, A. Tovar-Sánchez, A. Capet, E. Mason, J. T. Allen, A. Mahadevan, J. Tintoré, 2017, A multiplatform experiment to unravel meso- and submesoscale processes in an intense front (ALBOREX), *Frontiers in Marine Sci.*, doi:10.3389/fmars.2017.00039

50. Choi, Chang Jae, Charles Bachy, Gualtiero Spiro Jaeger, Camille Poirier, Lisa Sudek, Amala Mahadevan, Stephen J. Giovannoni, Alexandra Z. Worden, 2017, Newly discovered deep-branching marine plastid lineages are numerically rare but globally distributed, *Current Biology 27*, R1–R18, doi:10.1016/j.cub.2016.11.032

2016

49. MacKinnon, J.A., J.D. Nash, M.H. Alford, A.J. Lucas, J.B. Mickett, E.L. Shroyer, A.F. Waterhouse, A. Tandon, D. Sengupta, A. Mahadevan, M. Ravichandran, R. Pinkel, D.L. Rudnick, C.B. Whalen, M.S. Alberty, J. Sree Lekha, E.C. Fine, D. Chaudhuri, and G.L. Wagner. 2016. A tale of two spicy seas. *Oceanography* 29(2):50–61, doi:10.5670/oceanog.2016.38.

48. Mahadevan, A., G. Spiro Jaeger, M. Freilich, M. Omand, E.L. Shroyer, and D. Sengupta. 2016. Freshwater in the Bay of Bengal: Its fate and role in air-sea heat exchange. *Oceanography* 29(2):72–81, http://dx.doi.org/10.5670/oceanog.2016.40.

47. Gordon, A.L., E.L. Shroyer, A. Mahadevan, D. Sengupta, and M. Freilich. 2016. Bay of Bengal: 2013 northeast monsoon upper-ocean circulation. *Oceanography* 29(2):82–91, http://dx.doi.org/10.5670/oceanog.2016.41.

46. Hormann, V., L.R. Centurioni, A. Mahadevan, S. Essink, E.A. D'Asaro, and B. Praveen Kumar. 2016. Variability of near-surface circulation and sea surface salinity observed from Lagrangian drifters in the northern Bay of Bengal during the waning 2015 southwest monsoon. *Oceanography* 29(2):124–133, http://dx.doi.org/10.5670/oceanog.2016.45.

45. Lucas, A.J., J.D. Nash, R. Pinkel, J.A. MacKinnon, A. Tandon, A. Mahadevan, M.M. Omand, M. Freilich, D. Sengupta, M. Ravichandran, and A. Le Boyer. 2016. Adrift upon a salinity-stratified sea: A view of upper-ocean processes in the Bay of Bengal during the southwest monsoon. *Oceanography* 29(2):134-145, doi:10.5670/oceanog.2016.46.

44. Lotliker, A.A., M.M. Omand, A.J. Lucas, S.R. Laney, A. Mahadevan, and M. Ravichandran. 2016. Penetrative radiative flux in the Bay of Bengal. *Oceanography* 29(2):214–221, http://dx.doi.org/10.5670/oceanog.2016.53.

43. Sarma, V.V.S.S., G.D. Rao, R. Viswanadham, C.K. Sherin, J. Salisbury, M.M. Omand, A. Mahadevan, V.S.N. Murty, E.L. Shroyer, M. Baumgartner, and K.M. Stafford. 2016. Effects of freshwater stratification on nutrients, dissolved oxygen, and phytoplankton in the Bay of Bengal. *Oceanography* 29(2):222-231, http://dx.doi.org/10.5670/oceanog.2016.54.

42. Mukherjee, Sonaljit, Sanjiv Ramachandran, Amit Tandon and Amala Mahadevan Production and destruction of eddy kinetic energy in forced submesoscale eddy-resolving simulations. , 2016, *Ocean Modelling, 105,* 44-55, doi: 10.1016/j.ocemod.2016.07.002
41. Brody, S.R., M.S. Lozier and A. Mahadevan, Quantifying the impact of submesoscale processes on the spring phytoplankton bloom in a turbulent upper ocean using a Lagrangian approach, 2016, Geophys. Res. Lett., 43 (10), 5160-5169, doi:10.1002/2016GL068051
40. Wijesekara, H.W. and 20 co-authors, ASIRI An ocean-atmosphere initiative for Bay of Bengal, 2016, Bull. Amer. Met. Soc. 2016, doi:10.1175/BAMS-D-14-00197.1
39. Mahadevan, Amala, Impact of submesoscale physics on primary productivity of plankton, 2016, Annu. Rev. Mar. Sci. 2016. 8:17.1–17.24, doi: 10.1146/annurev-marine-010814-015912

2015

38. Singh, R. M.M. Bandi, A. Mahadevan and S. Mandre, Monami as an oscillatory hydrodynamic instability in a submerged sea grass bed*,* 2015, *J. Fluid Mech.* doi:10.1017/jfm.2015.642
37. Omand M. and A. Mahadevan, Shape of the oceanic nitracline, 2015, *Biogeosciences*, 11, 14729-63, doi:10.5194/bgd-11-14729-2014
36. Nagai, T. A. Tandon, E. Kunze and A. Mahadevan, Spontaneous generation of near-inertial waves by the Kuroshio front, 2015, *J. Phys. Oceanogr*. 45, 2381-2406. doi: 10.1175/JPO-D-14-0086.1
35. Omand, M.M., E.A. D'Asaro, C.M. Lee, M-J. Perry, N. Briggs, I. Cetinic, A. Mahadevan, Eddy-driven subduction exports particulate organic carbon from the spring bloom, 2015, *Science*, 348 (222), doi: 10.1126/science.1260062
34. Shcherbina, A. Y., M. A. Sundermeyer, E. Kunze, E. D'Asaro, G. Badin, D. Birch, A.-M. E. G. Brunner-Suzuki, J. Callies, B. T. Kuebel Cervantes, M. Claret, B. Concannon, J. Early, R. Ferrari, L. Goodman, R. R. Harcourt, J. M. Klymak, C. M. Lee, M.-P. Lelong, M. D. Levine, R.-C. Lien, A. Mahadevan, J. C. McWilliams, M. J. Molemaker, S. Mukherjee, J. D. Nash, T. Özgökmen, S. D. Pierce, S. Ramachandran, R. M. Samelson, T. B. Sanford, R. K. Shearman, E. D. Skyllingstad, K. S. Smith, A. Tandon, J. R. Taylor, E. A. Terray, L. N. Thomas, and J. R. Ledwell (2015) The LatMix summer campaign: Submesoscale stirring in the upper ocean. Bull. Amer. Meteor. Soc., 96, 1257–1279.doi: http://dx.doi.org/10.1175/BAMS-D-14-00015.1

2014

33. Ramachandran, S., A. Tandon and A. Mahadevan, Enhancement in vertical fluxes at a front by mesoscale-submesoscale coupling, 2014, *J. Goephys. Res*. 119 *(12)*, 8495-8511, doi: 10.1002/2014JC010211
32. Lucas, A.J (17 authors), Mixing to Monsoons: Air-Sea Interactions in the Bay of Bengal, *EOS, Transactions, AGU,* 95(30), July 2014, 269-276.
31. Mahadevan, A., Eddy effects on ocean biogeochemistry, 2014 (January), *Nature, News & Views*, doi:10.1038/nature13048

2013

30. Omand, M. and A. Mahadevan, Large-scale alignment of oceanic nitrate and density, 2013, *J. Geophys. Res.* 118(10), 5322-5332, doi:10.1002/jgrc.20379

29. Wang, J., G.R. Flierl, J.H. LaCasce, J. McLean and A. Mahadevan, Reonstructing the ocean's interior from surface data, 2013, *J. Phys. Oceanogr.,* 43, 1611-26, DOI: 10.1175/JPO-D-12-0204.1

28. Ramachandran, S., A. Tandon and A. Mahadevan, Effect of subgrid scale mixing on the evolution of submesoscale instabilities, 2013, *Ocean Modelling*, 66, 45-63, DOI: 10.1016/j.ocemod.2013.03.001.

2012

27. Mahadevan, A., E. D'Asaro, C. Lee and M-J Perry, Eddy-driven stratification initiates North Atlantic spring phytoplankton blooms, 2012, *Science*, 337 (6090), 54-58, DOI:10.1126/science.1218740

26. Mahadevan, A., A.V. Orpe, A. Kudrolli and L. Mahadevan, Flow-induced channelization in a porous medium, 2012, *Europhysics Letters EPL*, 98 (58003) doi: 10.1209/0295-5075/98/58003

25. Siedlecki, S., A. Mahadevan and D. Archer, Mechanism for export of sediment-derived iron in an upwelling regime, 2012, *Geophys. Res. Lett.* 39, L03601, doi:10.1029/2011GL050366

2011

24. Badin, G., A. Tandon and A. Mahadevan, Lateral mixing in the pycnocline by baroclinic mixed layer eddies, 2011, *J. Phys. Oceanogr.,* 41, 2080-2101.

23. Siedlecki, S. A., D. E. Archer, and A. Mahadevan, 2011, Nutrient exchange and ventilation of benthic gases across the continental shelf break, *J. Geophys. Res*., 116, C06023, doi:10.1029/2010JC006365.

22. Jönsson, B., J. Salisbury, and A. Mahadevan, Large variability in continental shelf production of phytoplankton carbon revealed by satellite, 2011, *Biogeosciences*, 8, 1213-1223, doi:10.5194/bg-8-1213-2011

21. Mahadevan, A., A. Tagliabue, L. Bopp, A. Lenton, L. Memery and M. Levy, 2011, Impact of episodic vertical fluxes on sea surface pCO_2, *Phil. Trans. R. Soc. A*. **369** 2009-2025 doi: 10.1098/rsta.2010.0340

2010 and before

20. Mahadevan, A., A. Tandon and R. Ferrari, 2010, Rapid changes in mixed layer stratification driven by submesoscale instabilities and winds, *J. Geophys. Res.,* 115, C03017, doi:10.1029/2008JC005203.

19. Hughes, Z., D. FitzGerald, C. Wilson, S. Pennings and A. Mahadevan, 2009, Rapid headward erosion of marsh creeks in response to relative sea level rise, *Geophys. Res. Lett*., 36, L03602, doi:10.1029/2008GL036000.

18. Jönsson, B., J. Salisbury and A. Mahadevan, 2009, Extending the use and interpretation of ocean satellite data with Lagrangian modeling, *Int. J. Remote Sensing,* 30 (13), 3331-3341.

17. Salisbury, J., D. Vandermark, C. Hunt, J. Campbell, B. Jonsson, A. Mahadevan, W. McGillis and H. Xue, 2009, Episodic riverine influence on surface DIC in the coastal Gulf of Maine, in press, *Estuarine Coastal and Shelf Science.*

16. Mahadevan, A., L. Thomas and A. Tandon, 2008 Comment on Eddy/wind interactions simulate extraordinary mid-ocean plankton blooms, *Science*, 320, 448b DOI: 10.1126/science.1152111.

15. Thomas, L., A. Tandon and A. Mahadevan, 2008, Submesoscale processes and dynamics, in *Ocean Modeling in an Eddying Regime*, Eds. M. Hecht and H. Hasumi, Geophysical Monograph 177, American Geophysical Union, Washington D.C., p 17-38.
14. Mahadevan A. and A. Tandon, 2006, An analysis of mechanisms for sub-mesoscale vertical motion at fronts, *Ocean Modelling*, 14 (3-4), 241-256.
13. Mahadevan, A., 2006, Modeling vertical motion at ocean fronts: Are nonhydrostatic effects relevant at submesoscales?, *Ocean Modelling*. 14 (3-4), 222-240.
12. LaCasce, J., A. Mahadevan, 2006, Estimating subsurface horizontal and vertical velocities from sea-surface temperature, *J. Marine Res*earch, 64 (5), 695-721.
11. Mahadevan, A. 2005, Spatial heterogeneity and its relation to processes in the upper ocean, Ecosystem Function in Heterogeneous Landscapes. Springer-Verlag NY, Eds. Lovett, G.M., Jones, C.G. Turner, M.G. & Weathers, K.C.
10. Mahadevan, A., M. Levy and L. Memery, 2004, Mesoscale variability of sea surface pCO2: What does it respond to?, *Global Biogeochem. Cycles*, 18 (1), GB101710.1029 2003GB002102.
9. Mahadevan, A. and J.W. Campbell, 2003, Biogeochemical variability at the sea surface: How it is linked to process response times, p215-227 Handbook of Scaling Methods in Aquatic Ecology: Measurement, Analysis, Simulation, ed L. Seuront and P.G. Strutton, CRC Press LLC, pp.624, 2003.
8. Ponte, R.M., A. Mahadevan, J. Rajamony and R.D. Rosen, 2003, Uncertainties in seasonal wind torques over the ocean, *J. Climate*, 16, 715-722.
7. Mahadevan, A. and J.W. Campbell, 2002, Biogeochemical patchiness at the sea surface, *Geophys. Res. Letters*, 29(19), 1926, doi:10.10292001GL014116
6. Mahadevan, A., J. Lu, S.P. Meacham and P. Malanotte-Rizzoli, 2001, The predictability of large-scale wind-driven flows, *Nonlinear Proc. in Geophys.*, 8(6), 449-465.
5. Mahadevan, A. 2001, An analysis of surface trends of bomb radiocarbon in the Pacific, *Marine Chemistry*, 73, 273-290.
4. Mahadevan, A. and D. Archer, 2000, Modeling the impact of fronts and mesoscale circulation on the nutrient supply and biogeochemistry of the upper ocean, *J. Geophys. Res.*, 105, (C1), 1209-1225.
3. Mahadevan, A. and D. Archer, 1998, Modeling a limited region of the ocean, *J. Comput. Physics*, 145, (2), 555-574.
2. Mahadevan, A., J. Oliger and R.L. Street, 1996, A non-hydrostatic mesoscale ocean model, Part 2: Numerical implementation, *J. Phys. Oceanogr.*, 26, (9), 1881-1900.
1. Mahadevan, A., J. Oliger and R.L. Street, 1996, A non-hydrostatic mesoscale ocean model, Part 1: Well-posedness and scaling, *J. Phys. Oceanogr.*, 26, (9), 1868-1880

Unrefereed Publications

[7] Mahadevan, Amala, D'Asaro, Eric A., Allen, John T., Almaraz García, Pablo, Alou-Font, Eva, Aravind, Harilal Meenambika, Balaguer, Pau, Caballero, Isabel, Calafat, Noemi, Carbornero, Andrea, Casas, Benjamin, Castilla, Carlos, Centurioni, Luca R., Conley, Margaret, Cristofano, Gino, Cutolo, Eugenio, Dever, Mathieu, Enrique Navarro, Angélica, Falcieri, Francesco, Freilich, Mara, Goodwin, Evan, Graham,

Raymond, Guigand, Cedric, Hodges, Benjamin A., Huntley, Helga, Johnston, Shaun, Lankhorst, Matthias, Lermusiaux, Pierre F. J., Lizaran, Irene, Mirabito, Chris, Miralles, A., Mourre, Baptiste, Navarro, Gabriel, Ohmart, Michael, Ouala, Said, Ozgokmen, Tamay M., Pascual, Ananda, Pou, Joan Mateu Horrach, Poulain, Pierre Marie, Ren, Alice, Rodriguez Tarry, Daniel, Rudnick, Daniel L., Rubio, M., Ruiz, Simon, Rypina, Irina I., Tintore, Joaquin, Send, Uwe, Shcherbina, Andrey Y., Torner, Marc, Salvador-Vieira, Guilherme, Wirth, Nikolaus, Zarokanellos, Nikolaos, WHOI Technical Report, ”CALYPSO 2019 Cruise Report: field campaign in the Mediterranean", 2020-01, DOI:10.1575/1912/25266, doi:10.1575/1912/25266

[6] Dever, Mathieu, Freilich, Mara, Hodges, Benjamin A., Farrar, J. Thomas, Lanagan, Thomas, Mahadevan, Amala, 2019, Technical Report: ”UCTD and EcoCTD Observations from the CALYPSO Pilot Experiment (2018): Cruise and Data Report", 2019-01, DOI:10.1575/1912/23637

[5] Ruiz, Simon, A. Mahadevan, A. Pascual, M. Claret, J. Tintore, E. Mason Multi-platform observations and numerical simulations to understand meso and submesoscale processes: A case study of vertical velocities in the Western Mediterranean. In "*New Frontiers in Operational Oceanography*", E. Chassignet, A. Pascual, J. Tintoré, and J. Verron, Eds., GODAE OceanView, 117-130, doi:10.17125/gov2018.ch05.

[4] Troupin, Charles, Ananda Pascual, Simon Ruiz, Antonio Olita, Benjamin Casas, Félix Margirier, Pierre-Marie Poulain, Giulio Notarstefano, Marc Torner, Juan Gabriel Fernández, Miquel Àngel Rújula, Cristian Muñoz, John T. Allen, Amala Mahadevan, and Joaquín Tintoré, 2019. The AlborEX dataset: sampling of submesoscale features in the Alboran Sea, *Earth System Science Data,* essd-2018-104.

[3] Mahadevan, A., 2019, Submesoscale Processes, *Encyclopedia of Ocean Sciences,* 3rd Edition, Elsevier, Inc. Eds. J. Kirk Cochran Henry Bokuniewicz Patricia Yager, ISBN 9780128130827

[2] Barth, A., Mahadevan, A., Pascual, A., Ruiz, S., & Troupin, C., 2018. The 48th liege colloquium: Submesoscale processes: Mechanisms, implications, and new frontiers. *Ocean Dynamics,* 68(8), 1067-1069. doi:10.1007/s10236-018-1173-5.

[1] Mahadevan, A., T. Paluszkiewicz, M. Ravichandran, D. Sengupta, and A. Tandon. 2016. Introduction to the special issue on the Bay of Bengal: From monsoons to mixing. Oceanography29(2):14–17, https://doi.org/10.5670/oceanog.2016.34.