

¹IRINA MARINOV

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EDUCATION

Princeton University

Ph.D. in Atmospheric and Oceanic Sciences
Thesis: *Controls on the air-sea balance of carbon dioxide*
Advisors: Prof. Jorge Sarmiento

Princeton, NJ
January 2005

Middlebury College

B.A., double major in Physics and Mathematics
Overall GPA: 3.95/4.0, Summa cum Laude, Class Salutatorian, Phi Beta Kappa.
Theses: Physics: *Wind-generated oscillations in Lake Champlain*. Advisers: Profs. T. Manley, R. Prigo
Math: *Study of Positive Operators on Hilbert Space*. Adviser: Prof. Steve Abbott

Middlebury, VT
May 1998

APPOINTMENTS

University of Pennsylvania

Assistant Professor of Earth and Environmental Science
Lecturer A, Department of Earth and Environmental Science

Philadelphia, PA
Aug 2012 - present
Jan 2009-July 2012

Woods Hole Oceanographic Institution

Long term Guest Investigator
Postdoctoral Investigator, Department of Marine Chemistry and Geochemistry
Host: Dr Scott Doney

Woods Hole, MA
Jan 2009- present
Feb 2007- Jan 2009

Massachusetts Institute of Technology

NOAA Postdoctoral fellow in Climate and Global Change
Host: Dr. Mick Follows, Program in Atmospheres, Ocean and Climate

Cambridge, MA
Jan 2005 - Feb 2007

AWARDS AND HONORS

- Univ. of Pennsylvania *Undergraduate Research Mentorship (PURM) award* April 2016
- Univ. of Pennsylvania "Climate Action Grants" awarded to support 3 undergraduate students for the 2016 summer; one award for the 2017 summer April '16;'17
- Univ. of Pennsylvania PURM awards to support undergraduates for the 2013-2015;2017 summers April '13-'17
- Featured Bio Sketch in *Women in Oceanography, Oceanography Journal*, Vol 27, Number 4. Dec 2014
- Outstanding Poster Presentation at the World Climate Research Programme (WCRP) Open Science Conference: Climate Research in Service to Society. Denver, Colorado. Oct 2011
- NOAA Postdoctoral Fellowship in Climate and Global Change, two year salary under the UCAR visiting Scientist Program (highly competitive program offers ~ 7 fellowships/year internationally). 2005 - 2007
- Andrew Nuquist Award for Outstanding Student Research in Vermont for undergrad physics thesis. 1999
- First year merit fellowship in natural sciences and mathematics. First year merit prize, Princeton U. 1998
- Salutatorian, Summa Cum Laude, Middlebury College. 1998
 - Phi Beta Kappa Prize. Awarded yearly to one Middlebury College student.
 - Highest honors in physics. Typically awarded once every four or five years.
 - High honors in mathematics.
 - Natural Sciences Division Prize, Robert Gould Prize in Physics and Francis Parker

¹ Updated Sept 12th, 2017

Mathematics and Computer Science Prize. Each annually awarded to one student.

- Junior Phi Beta Kappa. One of six Middlebury College junior recipients. 1997
- Charles A. Dana Scholar. One of twelve scholarship recipients. 1995

SERVICE AND LEADERSHIP EXPERIENCE

- Member of the University of Pennsylvania **Senate Committee on Faculty Development, Diversity and Equity** from Sept 2017 onward
- Member of the University of Pennsylvania **Senate Committee on Faculty and Administration**: Sept '14-May '17
- Faculty Representative, Ad Hoc Advisory Committee on Fossil Fuel Divestment, University of Pennsylvania, March-May 2016
- Participant, Penn Energy Front faculty group: Jan 2016-present
- Participant, **Penn Faculty Pathways Program for faculty leadership**: 2013-2014; 2014-2015
- **Panelist**: review of Earth Science proposals for NSF - October 2012 and May 2013; NASA - Sept 2013, Jan 2016
- Member of the Joint US Climate Variability and Predictability Research Program – Ocean Carbon and Biogeochemistry (CLIVAR/OCB) Working Group "Heat and carbon uptake by the Southern Ocean": 2012-2015.
- Ongoing associate investigator with the Princeton-led "Southern Ocean Carbon and Climate Observations and Modeling" (SOCCOM) project, <http://soccom.princeton.edu/>, 2014 –present.
- **Panelist**: review of oceanographic research proposals for the Schmidt Ocean Institute, Sept 2014.
- **Current Referee for**: NASA, NSF, and Schmidt Ocean Institute proposals. Past Referee for: Journal of Marine Sciences, Global Biogeochemical Cycles, Biogeosciences.
- **Expert reviewer** for National Oceanic Atmospheric Administration (NOAA) Internal technical reports (2012)
- **Session co-chair**: Ocean Sciences Meeting in New Orleans (Feb 2016): 1 poster, 3 oral sessions on "Physical and Biogeochemical processes in the Southern Ocean: Observations, State Estimation and Modeling"
- **Session Chair**: TOS/ASLO/AGU Ocean Sciences Meeting (2012) sessions on "Improving the representation of plankton ecology in Earth System Models" (III) Ocean Sciences Meeting (2006), four sessions on "High Latitude Dynamics and Biogeochemistry" (with M. Follows and Arnold Gordon)
- Extensive undergraduate, graduate and postdoctoral **mentoring** and **advising**, Dept of Earth and Environmental Science, Penn, 2009-present
- Mentorship discussions with students on career paths and **being a woman in sciences**: Penn Society of Physics Students Conference, May 2015; Penn Women in Physics Luncheon, Nov 2015.
- Purchased and setup a sizable Linux cluster to run climate simulations locally at Penn (2010), updated since then.
- Led three successful postdoctoral searches at Penn (2010, 2011, 2012)
- Ran a university wide preceptorial "How bad is bad? Climate change in the next 100 years and beyond" (Nov 2011)
- Served on departmental Graduate Admissions Committee (Penn, 2009-present)
- Hosted numerous outside invited speakers for departmental talk series (Penn, 2009-present)
- Participated in roundtable discussions with Penn students, alumni and the general public (April-Aug 2011)
- Gave 60s lectures on "Water and future climate change" – posted on **YouTube** - to advertise my climate change research/class at Penn. http://www.sas.upenn.edu/home/news/sixtysec_lectures_archive.html#M
- Participated in UPENN Faculty panel discussions on Sustainability and the Environment (2013 and 2014) and on Climate Change (April 2009). Organized student participation and posters in the "Symposium on Responses, Risks and Adaptation to Climate Change", Penn, May 2009.
- **Organizer**, MIT Climate and Oceanography weekly seminars, Program in Atmosphere Ocean and Climate, 2005-2006.
- **Organizer**, MIT women in science group, responsible for meetings and inviting speakers, 2005.
- **Student Representative** of the Atmospheric Ocean Sciences Program in the *Graduate Student Government (GSG)* of Princeton University, 2003-2004.

OUTREACH EXPERIENCE

• **Alumni Outreach**

“Penn Faculty Panels on energy, sustainability and environment” in Chicago and Washington, DC. Oct 7 & Oct 16
Organized by Penn’s Alumni Relations Office, a *Penn to You Alumni program*. Moderated by Dean Fluharty 2014

Faculty host for Penn alumni group and boat lecturer for the 2014 ***Penn Alumni expedition to Antarctica***, West Antarctic Peninsula and the Weddell Sea. Jan31-Feb13
2014

• **Radio**

Climate change: science, politics and public opinion: A radio show with I. Marinov, Dr. Michael Mann (Penn State) and Dr. Naomi Oreskes (Harvard) on ***NPR’s RadioTimes with Marty Moss-Coane*** Jan 12 2015
<http://why.org/cms/radiotimes/2015/01/14/climate-change-science-politics-and-public-opinion/>

• **Philadelphia area and university-wide Outreach**

Organized Outreach event for St Mary’s Summer Camp kids (grades 1-6): “Penn Water Day” June 7, 2017
The Southern Ocean and its significant role in climate, Saint Joseph University (invited talk) March 22, ‘17
The role of the ocean in future climate warming, Philadelphia Geological Society meeting, March 16, ‘17
Bryn Mawr College (invited talk)

Climate models and Arctic Change, UPenn Medical School, Epidemiology and Biostatistics Dept (invited) Oct 2016
Climate change over the 21st century: a short summary, Penn Engineering Alumni Society meeting, Jan 14 2015
University of Pennsylvania (invited talk)

Mentorship discussions focused on career development and women in STEM, presentations at the *Society of Physics Students Conference* and *Penn Women in Physics* luncheon, U. of Pennsylvania (invited) May & Nov
2015
A summary of expected Climate change over the 21st century, Franklin Inn Club, Philadelphia (invited talk) Oct 16 2015
A Story of the Southern Ocean, a talk at the World Café Live, part of the Penn Science Café series Dec 8 2015

TEACHING

U. Penn, Department of Earth and Environmental Science

Designed from scratch and taught two classes:

- ENVS 312/PHYS 314 “Ocean-Atmosphere Dynamics and Implications for Climate Change” Spring of ‘09, mixed level junior/senior/graduate class with extensive MATLAB based laboratories ‘11 through ‘17
- ENVS 204 “Global Climate Change” Fall of 2009 through ‘14; ‘17 sophomore level class; mixed major/non-major audience, with climate data analysis labs Spring 2015
- Contributed to teaching GEOL510 “Geophysical Fluid Dynamics” with visiting prof. Dr. Nathan Paldor, Hebrew Univ. of Jerusalem. Graduate level class.

African Institute for Mathematical Sciences (AIMS)

- Supervised an AIMS student project on “Fe fertilization in the ocean and consequences for the global carbon cycle”. The essay phase is a required step for the AIMS postgraduate degree. Cape Town, South Africa Jan-May 2007
- Co-designed and co-taught intensive 4-week course on “Introduction to climate modeling” with Dr. Liz Moyer (Harvard University). Masters level course hands-on, daily lectures and computer labs. Dec. 2006

SUMMER SCHOOL TEACHING AND CRUISES

- **Invited speaker and workshop teacher** for the graduate workshop “Ocean Ecologies and their Physical Habitats in a Changing Climate” at the Mathematical Biosciences Institute, The Ohio State University, June 20 - July 1, 2011
- **Invited speaker** at the University of Washington’s Program on Climate Change “*graduate Summer Institute on Climate Feedbacks*”, Friday Harbor Labs, Sept 14-17th 2010
- Participated in the June 2008 BATS 236 cruise. Assisted Dr. Ken Buessler’s WHOI group with carbon particle flux measurements (NBST, PITS, in situ pumps) and with deployments of the video plankton recorder.

MENTORING EXPERIENCE

Postdoctoral investigators in the Marinov group (all UPenn):

Dr. Behzad Asadih (August 2017-present)

Dr. Dr. Anna Cabre (September 2012-May 2015, currently Marie Curie fellow, Institut de Ciències del Mar, Barcelona)

Dr. Raffaele Bernardello (Jan 2011-Jan 2014; currently researcher at Southampton Oceanographic, UK)

Dr. Svetlana Milutinovic (Jan 2012-Jan 2014)

Graduate student advisees:

Priya Sharma (Penn Earth & Env Science dept., PhD thesis advisor: Aug 2014 – present)

Danica Fine (Penn Systems Engineering, Masters student, independent study: Aug 2017-present)

Andrew Gunn (Penn Earth & Env Science dept., PhD thesis advisor: June 2016 – Dec 2016)

Raghavendra Prasad Palle (Penn Mech Engineering, Masters student, independent study: May 2013-May 2015)

Karan Sharma (Penn Mech Engineering, Masters student, independent study: May 2013- Oct 2014)

Shirley Leung (Masters thesis advisor: 2012- 2013). Currently a PhD student in oceanography at Univ. of Washington.

Roman Shor (Masters student, Aug 2010-Aug 2011). Currently a PhD student in geosciences at U. Texas.

Additional PhD student committees:

Rachel Valetta, Penn Earth & Env Science dept., Aug 2016-present

Undergraduate research advisees (all UPenn) and grant awards:

John San Soucie (physics, Penn Climate Action Grant for 2016 summer): Sept 2016 - present

Joseph Brau (physics, Hayden Scholar for 2016 summer): May 2017 – present

Muriel Leung (physics): Sept 2016 - present

Harry Smith (Penn Chemistry sophomore, Penn Climate Action grant for 2015, 2016 summers): May 2015 – present

Ji Wong Bang (Vagelose Energy program summer funding): May 2017 – Sept 2017

Robin Zhang (Penn CS, Penn PURM summer student grant): May 2016 –May 2017

Yann Pfizer (Penn EES, Vagelose Energy program summer funding): May 2016 –May 2017

Karthik Ramesh (Penn bioengineering junior, Penn PURM student grant for 2015 summer): Nov 2015 – May 2017

Jonathan Schiff (Penn physics, PURM summer student grant): May 2016-Sept 2016

Mo Green and Ryan Dungee (PURM summer students and academic year independent study): May 2013-May 2016

David Shields (PURM summer student grant and academic year independent study): Jan 2014 – May 2016

Danica Fine (PURM summer student grant and academic year independent study): Jan 2014 – May 2015

Eric Lu (Vagelose Integrated Program in Energy research): May 2013- Sept 2013

Lingbin Cai (Penn engineering student, independent study): Jan 2013-Sept 2013

Hyejung Lee (Earth Science dept. senior project): Sept 2012 - May 2013

Rongrong Nancy Jin (Wharton School senior thesis co-advisor): 2011-2012

David Stahl (EES junior, independent study), fall 2012

Shirley Leung (Penn Earth Science junior project): 2011-2012

High school advisee: Sungwoo Park (Choate Rosemary Hall, CT: summer of 2016).

PROFESSIONAL SOCIETIES

- Member, American Geophysical Union, American Society for Limnology and Oceanography, American Association for the Advancement of Science, European Geophysical Union

COLLABORATORS

Raffaella Bernardello (NOC, UK), David Bianchi (UCLA), Anna Cabre (Penn), Casimir deLavergne (McGill), Scott C. Doney (WHOI), Mick Follows (MIT), Eric Galbraith (McGill), Anand Gnanadesikan (Johns Hopkins), N. Gruber (ETH), Lionel Guidi (U. Hawaii), Tihomir Kostadinov (UCSB), Shirley Leung (UW), Ivan Lima (WHOI), Keith Lindsey (NCAR), Svetlana Milutinovic (Penn), Natalie Mahowald (Cornell U), Mark Moore (Southampton, UK), Keith Moore (UC Irvine), Anastasia Romanou (NASA GISS and Columbia U), Joellen Russell (Arizona), Jorge Sarmiento (Princeton), Rick Slater (Princeton), Lan Smith (JAMSTEC/Japan), Robbie Toggweiler (NOAA/GFDL), Jaime Palter (URI).

PAPERS (Marinov group postdocs/students underlined)

- J.L. Russell, I. Kamenkovich, C. Bitz, R. Ferrari, S.T. Gille, P.J. Goodman, R. Hallberg, K. Johnson, **I. Marinov**, M. Mazloff, S. Riser, J. L. Sarmiento, K. Speer, L. D. Talley and R. Wanninkhof, *Metrics for the Evaluation of the Southern Ocean in Coupled Climate Models and Earth System Models* (submitted, JGR-Oceans SOCCOM Special Issue).
- Cabré A., **I. Marinov**, and A. Gnanadesikan, *Global atmospheric teleconnections and multi-decadal climate oscillations driven by Southern Ocean convection*, *Journal of Climate*, 30, 8107-8126, <https://doi.org/10.1175/JCLI-D-16-0741.1> (2017).
- Marinov, A. M., **I. Marinov** and M.A. Diminescu, *Pumping regime influence on groundwater quality downstream of a polluted lake and upstream of a clean lake: a joint laboratory-modeling setup*, *Environmental Engineering and Management Journal (EEMJ)*, 16(5), 1081-1091 (2017).
- Kostadinov, T.S., A. Cabré, H. Vedantham, **I. Marinov**, A. Bracher, R. Brewin, A. Bricaud, T. Hirata, T. Hirawake, N. Hardman-Mountford, C. Mouw, S. Roy and J. Uitz, *Inter-Comparison of Phytoplankton Functional Types Derived from Ocean Color Algorithms and Earth System Models: Phenology*. *Remote Sensing of Environment* 190, 162-177, doi:10.1016/j.rse.2016.11.014 (2017).
- Kostadinov, T.S., Milutinović, S., **I. Marinov**, A. Cabré, *Carbon-Based phytoplankton size classes retrieved via ocean color estimates of the particle size distribution*, *Ocean Sci.*, 12, 1-15, doi:10.5194/os-12-1-2016 (2016).
- A. Cabré, D. Shields, **I. Marinov** and T. S. Kostadinov, *Phenology of Size-Partitioned Phytoplankton Carbon-Biomass from Ocean Color Remote Sensing and CMIP5 Models*, *Front. Mar. Sci.*, 3:39, doi: 10.3389/fmars.2016.00039 (2016).
- S. Leung, A. Cabré and **I. Marinov**, *A latitudinally-banded Phytoplankton response to 21st Century Climate Change in the Southern Ocean across the CMIP5 Model Suite*, *Biogeosciences*, 12, 5715-5734, doi:10.5194/bg-12-5715-2015, (2015).
- Cabré, A., **I. Marinov**, R. Bernardello and D. Bianchi: *Oxygen minimum zones in the tropical Pacific across CMIP5 models: mean state differences and climate change trends*, *Biogeosciences*, 12, 5429-5454 doi:10.5194/bg-12-5429-2015, (2015).
- Marinov, I.**, R. Bernardello and J. B. Palter: *Present and projected climate variability at high latitudes and its impact on the ocean carbon cycle*. *US CLIVAR Variations*, 13(2), (2015).
- Cabré, A., **I. Marinov**, S. Leung, *Consistent global responses of marine ecosystems to future climate change across the IPCC AR5 Earth System Models*, *Climate Dynamics*, doi: 10.1007/s00382-014-2374-3, (2015).
- Bernardello, R., **Marinov, I.**, Palter, J.B., Galbraith, E.D., Sarmiento, J.L. *Impact of Weddell Sea deep convection on natural and anthropogenic carbon in a climate model*, *Geophysical Research Letters*, 41 (20), 7262-7269, doi: 10.1002/2014GL061313, (2014).
- Marinov, I.** and A.M. Marinov, *A Coupled Mathematical Model to Predict the Influence of Nitrogen Fertilization on Crop, Soil and Groundwater Quality*, *Water Resources Management*, 28 (15), 5231-5246, doi: 10.1007/s11269-014-0664-5, (2014).
- Marinov, I.** and A.M. Marinov, *The influence of a municipal solid waste landfill on groundwater quality: a modelling case study for Raureni-Ramnicu Valcea (Romania)*, *International Journal of Computational Methods and Experimental Measurements*, 2 (2), p. 1-18, WIT Press, doi: 10.2495/CMEM-V0-NO-1-18, (2014).
- de Lavergne, C., J. B. Palter, E. D. Galbraith, R. Bernardello and **I. Marinov**. *Cessation of Weddell Sea convection due to climate warming*, **Nature Climate Change**, 4(4), 278-282, doi: 10.1038/nclimate2132, (2014).
Extensive Press coverage by the Scientific American, Science World Report, NBC News, French Tribune, etc. Links to press coverage can be found at <https://climate.sas.upenn.edu/node/34>
- Bernardello, R., **I. Marinov**, J B. Palter, J L. Sarmiento, E D. Galbraith, R D. Slater. *Response of the Ocean Natural Carbon Storage to Projected Twenty-First-Century Climate Change*. *J. Climate*, 27, 2033-2053, doi: 10.1175/JCLI-D-13-00343.1, (2014).
- Marinov, I.**, S. Doney, I. Lima, K. Lindsey, K. Moore and N. Mahowald. *North-South asymmetry in the modeled phytoplankton community response to climate change over the 21st century*, *Global Biogeochem. Cycle*, 27, doi:10.1002/2013GB004599, (2013).
- Moore, C.M., Mills, M.M., Arrigo, K., Berman-Frank, I., Bopp, L., Boyd, P.W., Galbraith, E., Geider, R.J., Guieu, C., Jaccard, S, Jickells, T., La Roche, J., Lenton, T., Mahowold, N., Maranon, E., **Marinov, I.**, Moore, K., Nakatsuka, T., Oschlies, A., Saito, M., Thingstad, F., Tsuda, A., Ulloa, O. and Wallace, D.. *Oceanic nutrient limitation: processes, patterns and potential for change*, **Nature Geoscience**. doi:10.1038/ngeo1765, (2013).

- Palter, J., **I. Marinov**, J. Sarmiento, and N. Gruber. *Large scale nutrient fronts of the world ocean: impacts on biogeochemistry*. In: Large-Scale Chemical Fronts of the World Ocean, Springer-Verlag, ed. I. Belkin, doi:10.1007/698_2013_241, (2013).
- Bernardello, R., Cardoso, J. G., Bahamon, N., Donis, D., **Marinov, I.**, and Cruzado, A. *Factors controlling interannual variability of vertical organic matter export and phytoplankton bloom dynamics – a numerical case-study for the NW Mediterranean Sea*, Biogeosciences 9, 4233-4245, doi:10.5194/bg-9-4233-2012, (2012).
- Marinov, I.** and A. Gnanadesikan, *Changes in ocean circulation and carbon storage are decoupled from air-sea CO₂ fluxes*, Biogeosciences 8, 505-513, doi:10.5194/bg-8-505-2011, (2011).
- Marinov, A.M. and **I. Marinov**, *Pumping regime influence on groundwater quality in the proximity of a polluted lake*, Water Resources Management VI, WIT Transactions on Ecology and the Environment, Vol 145, 423-435, doi:10.2495/WRM110371, (2011). www.witpress.com, online ISSN 1743-3541
- Marinov, I.**, S. Doney and I. Lima, *Response of ocean phytoplankton community structure to climate change over the 21st century: partitioning the effects of nutrients, temperature and light*, Biogeosciences 7, 3941-3959, doi:10.5149/bg-7-3941-2010, (2010).
- Sarmiento, J. L., A. Gnanadesikan, **I. Marinov**, and R. D. Slater, *The role of marine biota in the CO₂ balance of the ocean-atmosphere system*. In: C.M. Duarte (Ed.). The Role of Marine Biota in the Functioning of the Biosphere. Fundación BBVA, Madrid, (2010).
- Gnanadesikan, A. and **I. Marinov**, *Export is not enough: Nutrient cycling and carbon sequestration*, Marine Ecological Progress Series, invited contribution to the Thematic Section on "Implications of large scale iron fertilization of the oceans", Vol. 364, 289-294, doi:10.3354/meps/07750, (2008).
- Marinov, I.**, A. Gnanadesikan, J.L. Sarmiento, R. Toggweiler and B. Mignone, *Impact of oceanic circulation on the ocean biological carbon storage and atmospheric pCO₂*, Global Biogeochem. Cycles, Vol 22, GB3007, doi:10.1029/2007GB002958, (2008).
- Marinov, I.**, M. Follows, A. Gnanadesikan, J.L. Sarmiento and R.D. Slater, *How does ocean biology affect atmospheric pCO₂? Theory and models*, JGR Oceans, Vol 113, C07032, doi:10.1029/2007JC004598, (2008).
- Marinov, I.**, A. Gnanadesikan, R. Toggweiler, and J.L. Sarmiento, *The Southern Ocean Biogeochemical Divide*, **Nature** (441), 946-967, doi: 10.1038/nature04883, (2006).
- Marinov, I.** and Warren Judd, *Ocean Carbon*, New Zealand Geographic, nr. 81, (2006).
- Marinov, I.** and J.L. Sarmiento, *The role of the oceans in the global carbon cycle: an overview*, Ocean Carbon Cycle and Climate, NATO ASI volume (251-295) ed. M. Follows & T. Oguz, Kluwer Academic Publ, (2004).
- Smith, K.S., G. Boccaletti, C.C. Henning, **I. Marinov**, C.Y. Tam, I.M. Held and G.K.Vallis, *Turbulent Diffusion in the Geostrophic Inverse Cascade*, Journal of Fluid Mechanics, 469, 13-48, (2002).
- Abott, S., and **I. Marinov**, *The Boundedness of the Riesz projection on spaces with weights*, Pacific Journal of Mathematics, 198 (2), 257-267, (2001).

PAPERS (in preparation, Marinov group postdocs/students underlined)

- Marinov I.**, A. Cabre, S. Molodtsov, J. San Soucie, *Decadal climate oscillations driven by Southern Ocean convection: oceanic teleconnections* (in prep. for J. Climate Dynamics)
- P. Sharma, **I. Marinov**, T. Kostadinov, A. Cabre, *Increasing biomass in the global and warm oceans? Unexpected new insights from SeaWiFS* (in prep. for GBC).
- P. Sharma, **I. Marinov**, A. Awnesh, T. Kostadinov, *Separating ENSO types with ocean-color biomass products* (in prep.)

PAPERS (other)

- Co-author: Lauder Institute White Paper on "Water: scarcity, excess, and the geopolitics of allocation", the Lauder Institute and the Wharton School, University of Pennsylvania, May 2016.
- Marinov, I.** and A.M. Marinov, *How sustainable agriculture can improve groundwater quality: a model study for a soil and aquifer pollution case*, paper SDEWES11-0762, proceedings 6th Dubrovnik conference on sustainable development of energy, water & env. Systems, Dubrovnik, Croatia, Sept 2011.
- Marinov, A., and **I. Marinov**, *Mathematical modeling of internal and surface waves in a thermally stratified lake*, Romanian Conference on technologies and equipment for improving the quality of the environment - proceedings, edited by the Politechnical University of Bucharest, Romania, vol. 10, 1998.

SCHOLARLY PRESENTATIONS:

Departmental Seminars/ Colloquia

- Causes and Consequences of Climate Change*, presentation to MBA students in the Lauder Institute of Management & International Studies, University of Pennsylvania, April 4th 2017 (invited).
- The Southern Ocean and its significant role in climate*, Saint Joseph University, March 22nd 2017 (invited Colloquia).
- The important role of the ocean in climate*, Philadelphia Geological Society meeting, Bryn Mawr College, March 16th 2017 (invited talk).
- Global teleconnections via the ocean and atmosphere induced by Southern Ocean deep convection on multi-decadal timescales*, Lamont-Doherty Earth Observatory, Ocean & Climate Physics Seminars, Nov 11th 2016 (invited)
- Southern Ocean deep convection and global climate implications via ocean and atmospheric teleconnections*, Dept. of Earth and Environmental Science, Lehigh University, Sept 8th 2016 (invited talk).
- Southern Ocean dynamics: changes over the 21st century and global implications*, Dept. of Earth and Planetary Sciences, MIT, March 4th 2015 (invited talk).
- The Southern Ocean and global climate teleconnections*, Dept. of Earth and Environmental Science, Univ. of Pennsylvania, Feb 2nd 2015 (departmental Geolunch seminar)
- A slowdown of Southern Ocean convection and Antarctic Bottom Water over the 21st century: global climate and biogeochemical implications*, Dept. of Earth Science, Rice University, Oct 23 2014 (invited talk).
- A shutdown of Southern Ocean deep convection in a future climate: Impacts on carbon uptake and storage in Earth System Models*, Physical Oceanography Lunch Seminar, School of Oceanography, University of Washington, March 12, 2014 (invited talk)
- The Southern Ocean and its critical role in the global carbon and heat cycles: now and under future climate change*, Mechanical Engineering (MEAM) Department, Univ. of Pennsylvania, Dec. 3, 2013.
- Response of the ocean carbon pumps and oxygen concentrations to changes in ocean stratification: preliminary results from Earth System models* (invited talk)
Earth & Ocean Sciences Dept., University of British Columbia, Vancouver, Canada, April 13 2012
- Why the Southern Ocean is special: insights from global modeling of ocean physics, carbon and ecology* (invited talk)
Earth & Ocean Sciences Dept., University of British Columbia, Vancouver, Canada, April 12 2012.
- Ocean ecology and carbon cycling in a future warmer world: from simple theory to complex models.*
Invited Talks at:
Dept. of Biology, University of Southern California, Los Angeles, California, March 22nd 2012
Bigelow Oceanographic Laboratory, Maine. Jan 25th 2012
Dept. of Geography and Urban Planning, Arizona State University, Arizona. Jan 18th 2012
Dept. of Applied Mathematics and Physics, Columbia University, NYC. Feb 16th, 2012
Dept. of Atmospheric Sciences, University of Illinois Urbana Champaign, Illinois. Feb 13th 2012
Dept. of Physics, University of Toronto, Canada. Feb 9th 2012
Dept. of Geology, McGill University, Montreal, Canada. Dec 2nd 2011
- How bad is bad? Climate change in the next 100 years and beyond*
University of Pennsylvania, Nov 10th 2011.
- Ocean ecology and the carbon cycle in a warmer world*
Department of Earth and Environmental Science, University of Pennsylvania, April 1st 2011.
- Do microscopic ocean plants matter for climate?* (invited talk)
Department of Geography and the Environment, Villanova University, PA, March 29th 2011.
- Response of ocean phytoplankton ecology to climate change and consequences for the carbon cycle*
Biology and Paleo Environment series, Lamont-Doherty Earth Institute, NY, Jan 14th 2011.
- Ocean Phytoplankton in a warmer world, invited talks at:*
Horn Point Lab Laboratory of the Univ. of Maryland, MD, Sept 8th 2010.
Biology Dept., Temple University, Philadelphia, PA, April 12th, 2010.
- How the ocean controls atmospheric CO₂*
University of Pennsylvania, Dept. of Earth and Environmental Sciences, May 2008.
- Oceanic biological carbon pump: mechanisms and controls on atmospheric pCO₂*, invited talks at:
IMCS, Rutgers University, October 2007
Woods Hole Oceanographic Institution, June 2007

Oceanic Controls on Atmospheric pCO₂, invited talks at:

University of Chicago, John Hopkins U., Boston U., April 2007

The impact of circulation on the biological carbon storage in the ocean and on atmospheric pCO₂, invited talks at:

School of Oceanography, University of Washington, October 2006

Lamont-Doherty Earth Observatory, September 2006

NOAA Global and Climate Change Postdoctoral Fellowship Program, 7th Summer Institute, July 2006

The Southern Ocean biogeochemical divide, invited talks at:

Global Environmental and Climate Change Center, McGill University, April 2006

The Center for Global Change Science, University of Toronto, May 2006

Why the Antarctic is crucial for atmospheric CO₂ and the Subantarctic for global oceanic biological production: the importance of circulation, Oceanography and Climate Sack Lunch Seminar, MIT, November 2005.

Conference / Workshop Presentations (Marinov group students or postdocs underlined)

How are we doing at modeling changing ocean ecosystems? Earth System Model inter-comparison and theoretical approaches. Marinov's talk and poster at the IMBER IMBIZO meeting at WHOI, October 2-6, 2017 (upcoming)

Characterising Ocean Phytoplankton Biomass for different ENSO Flavors (poster IG03-A008), A. Singh, P. Sharma, **I. Marinov** and T. Kostadinov, Asia Oceanic Geosciences Society (AOGS2017) meeting, Singapore, Aug 07, 2017.

Unexpected Biomass trends in the global and warm oceans from SeaWiFS data: 1997-2010 (poster), **I. Marinov**, P. Sharma, A. Cabre, T. Kostadinov, at the Ocean Carbon & Biogeochemistry Workshop, Woods Hole Oceanographic Institution, Woods Hole, MA, June 26-29, 2017.

Exploring regular Southern Ocean Convection in a coupled climate model: global oceanic implications, poster at the Southern Ocean Carbon & Climate Observations & Modeling (SOCCOM) Meeting, Princeton Environmental Institute, Princeton, NJ., May 10-12th, 2017

A new theoretical framework for ocean carbon, A. Gunn and **I. Marinov**, AGU Meeting, San Francisco, Dec 2016 (poster)

Tropical teleconnections via the ocean and atmosphere induced by Southern Ocean deep convective events, **I. Marinov**, A. Cabre, A. Gnanadesikan, A. Gunn, AGU Meeting, San Francisco, Dec 2016 (poster)

El Nino oscillations and Ocean Biology from SeaWiFS, P. Sharma, **I. Marinov**, T. Kostadinov, AGU Meeting, San Francisco, Dec 2016 (poster)

Phenology of size-partitioned phytoplankton carbon-biomass from Ocean Color Remote Sensing and CMIP5 models, **I. Marinov**, A. Cabre, D. Shields and T. Kostadinov, Ocean Carbon and Biogeochemistry Summer Workshop, Woods Hole Oceanographic Institution, MA, July 25-29, 2016 (poster)

I. Marinov, "Southern Ocean deep convection and teleconnections", in MIT workshop on the "Response of global climate to the Antarctic Ozone Hole", MIT, Cambridge, MA, June 7-8, 2016 (invited talk)

How are we doing at modeling changing ocean ecosystems? Phenology and 21st century projections, **I. Marinov**, Joint NASA Ocean Color Research Team Meeting, Silver Spring, MD, May 2-4 2016 (invited talk)

Unexpected Biomass trends in the global and warm oceans from SeaWiFS data: 1997-2010, P. Sharma, **I. Marinov**, D. Shields, A. Cabre, NASA Ocean Color Research Team, Silver Spring, MD, May 2-4 2016 (poster)

Panelist in the "Water: scarcity, excess, and the geopolitics of allocation" conference, the Lauder Institute and the Wharton School, University of Pennsylvania, March 22-24, 2016

How are we doing at modeling changing ocean ecosystems?, panelist and presenter in the "Modeling a Living Planet" workshop, Princeton University, March 2016

Changing biomass in the global and warm oceans from SeaWiFS, P. Sharma, **I. Marinov**, D. Shields, A. Cabre, "Modeling a Living Planet" workshop, Princeton University, March 2016 (poster)

Increasing biomass in the global and warm oceans? Unexpected new insights from SeaWiFS, **I. Marinov**, D. Shields, P. Sharma, A. Cabre, AGU Ocean Sciences, New Orleans, Feb 2016 (talk ME23A-01)

Global decadal climate variability driven by Southern Ocean convection, A. Cabre and **I. Marinov**, AGU Ocean Sciences, New Orleans, Feb 2016 (poster PC14E-2102)

Remote Sensing of Phytoplankton Size Distribution: Phenology, D. Shields, **I. Marinov** and A. Cabre, AGU Ocean Sciences, New Orleans, Feb 2016 (poster)

A Latitudinally-Banded Phytoplankton Response to 21st Century Climate Change in the Southern Ocean across the CMIP5 Model Suite, S. Leung, A. Cabre, **I. Marinov**, AGU Ocean Sciences, New Orleans, Feb 2016 (poster HE44D-1534)

Decadal Climate Variability, **I. Marinov**, Southern Ocean Carbon and Climate Observations and Modeling (SOCCOM) Annual Meeting, Princeton Center for Theoretical Sciences, Princeton, May 12-14, 2015 (invited talk)

Southern Ocean open-sea convection teleconnections, A. Cabre and **I. Marinov**, European Geophysical Union (EGU) General Assembly, Abstract ID: EGU2015-2420, April 2015 (poster)

Effective, Active Learning Strategies for the Oceanography Classroom, Jane Dmochowski and **I. Marinov**, AGU meeting, San Francisco, Dec 2014 (poster)

21st century projections of ocean ecology and productivity across the CMIP5 models: contrasting the Southern Ocean and the Arctic. Anna Cabre, Shirley Leung and **I. Marinov**, AGU Meeting, San Francisco, Dec 2014 (talk)

Southern Ocean Convection and tropical teleconnections, **I. Marinov**, A. Cabre and A. Gnanadesikan, AGU Meeting, San Francisco, Dec 2014 (poster)

Southern Ocean AABW and convective slowdown, **I. Marinov**, Workshop on “Ocean’s Carbon and Heat Uptake: Uncertainties and Metrics” organized by US CLIVAR Southern Ocean working group, San Francisco, Dec 2014 (poster)

Inter-comparison of phenological parameters derived from different ocean color phytoplankton functional types algorithms, Kostadinov, T.S., Hirata, T. and **Marinov, I.**: 2014 Ocean Optics Conference, Portland, Maine, Oct 26-31, 2014 (poster)

Phytoplankton biomass and productivity across the CMIP5 models: 21st century projections. **I. Marinov**, Scoping for an “Interdisciplinary Coordinated Experiment of the Southern Ocean Carbon Cycle” (ICESOCC) Meeting, Scripps Inst. of Oceanography, UC San Diego, San Diego, CA, Sept 22-25 2014 (invited talk).

Antarctic Bottom Water slowdown and biogeochemical implications. **I. Marinov**, “The Southern Ocean Carbon and Climate Observations and Modeling” (SOCCOM) Meeting, Princeton, NJ, Sept 8-9th 2014 (invited talk).

Variability in Southern Ocean convection and AABW: global implications for climate and ocean carbon cycling, **Marinov, I.**, Workshop on “Southern Ocean physics and biogeochemistry with applications to the last glacial cycle”, Stockholm, Sweden, 11-12 June 2014 (invited talk).

A Latitudinally-Banded Phytoplankton Response to 21st Century Climate Change in the Southern Ocean across the CMIP5 Model Suite, Anna Cabre, Shirley Leung and **Marinov, I.** The IMBER (Integrated Marine Biogeochemistry and Ecosystem Research) ‘Future Oceans’ conference, Bergen, Norway, June 2014 (talk).

Interannual and Interdecadal Variability in Global Phytoplankton Community Size Structure Derived From Ocean Color Remote Sensing and IPCC-Class Ecosystem Models. **Marinov, I.**: NASA Ocean Color Research Team Meeting, Silver Spring, MD, May 2014 (invited talk).

Modeling the spectral shape of backscattering and its uncertainty – effects on retrieval of the underlying particle size distribution. Kostadinov, T.S., Milutinov, S., Hirata, T., **Marinov, I.**, Maritorea, S.: NASA Ocean Color Research Team Meeting, Silver Spring, MD, May 2014 (poster).

Impact of deep convection in the open Southern Ocean on natural and anthropogenic carbon uptake in a climate model, Bernardello, R., **Marinov, I.**, Palter, J.B., Galbraith, E.D. European Geophysical Union (EGU) General Assembly, Abstract ID: EGU2014-15347, April 2014 (talk).

Multisensor phytoplankton functional types from space: towards a global climate data record. Kostadinov, T.S. Milutinov, S. Hirata, T., **Marinov, I.**, Maritorea, S., AGU Ocean Sciences Conference, Honolulu, Hawaii, Abstract ID: 13953, poster ID: 3092, March 2014

Freshening, stratification and possible cessation of deep convection in the open Southern Ocean under anthropogenic climate change, De Lavergne, C.; Palter, J.B.; Galbraith, E.D.; Bernardello, R.; **Marinov, I.** AGU Ocean Sciences Conference, Honolulu, Hawaii. Abstract ID: 13976, poster ID: 844, March 2014

Consistent Global responses of Marine ecosystems to future climate change across the IPCC AR5 Earth System Models. Cabre, A.; **Marinov, I.**; Leung, S.; AGU Ocean Sciences Conference, Honolulu, Hawaii, March 2014. Abstract ID:16428, Talk.

Impact of Southern Ocean deep convection on natural and anthropogenic carbon uptake and storage in Earth System models. Bernardello, R.; **Marinov, I.**; Palter, J.B.; Galbraith, E.D.; Cabre, A.; AGU Ocean Sciences Conference, Honolulu, Hawaii, March 2014. Abstract ID: 17327, Talk.

A Southern Annular Mode (SAM) driven phytoplankton productivity response to 21st century climate change in the Southern Ocean across the CMIP5 model suite, Leung, S.; **Marinov, I.**; Cabre, A.; AGU Ocean Sciences Conference, Honolulu, Hawaii, March 2014. Abstract ID:17759; poster ID 3138.

Oxygen Minimum Zones (OMZ) across the CMIP5 models: 21st century climate-driven changes, **Marinov, I.**; Cabre, A.; Lingbin, C.; Bernardello, R., AGU Ocean Sciences Conference, Honolulu, Hawaii, March 2014. Abstract ID: 17867, poster ID 3248.

Response of phytoplankton to 21st century climate change in the Southern Ocean: an Earth System Model intercomparison. S. Leung, A. Cabre and **I. Marinov**, Ocean Carbon and Biogeochemistry Summer Workshop, Woods Hole Oceanographic Institution, MA, July 22-25th, 2013 (poster presented by I. Marinov)

Partitioning phytoplankton carbon biomass into size groups using satellite ocean colour observations, S. Milutinović, T. S. Kostadinov and **I. Marinov**, Ocean Carbon and Biogeochemistry Summer Workshop, Woods Hole Oceanographic Institution, MA, July 22-25th, 2013 (poster)

Partitioning Phytoplankton Carbon Biomass into Three Size Groups Using Satellite Ocean Colour Observations. S. Milutinović, T. S. Kostadinov and **I. Marinov**, The 45th International Liège Colloquium on Ocean Dynamics - Primary production in the ocean: from the synoptic to the global scale". Liege, 13-17 May 2013. (poster presented by postdoc Milutinovic)

Factors controlling interannual variability of vertical organic matter export and phytoplankton bloom dynamics. A numerical case-study for the NW Mediterranean Sea. R. Bernardello, J. G. Cardoso, N. Bahamon, D. Donis, **I. Marinov**, and A. Cruzado. EGU General Assembly 2013, Vienna, April 2013. (poster presented by Bernardello)

Decomposition of climate change effects on ocean natural and anthropogenic carbon uptake. R. Bernardello, **I. Marinov**, J. Palter, J. Sarmiento, E. Galbraith. EGU General Assembly 2013, Vienna, April 2013. (Talk by Bernardello).

Response of Southern Ocean Phytoplankton Ecology to Climate Change across the IPCC AR5 Earth System Models (oral), **Marinov**, A. Cabre and S. Leung. MAREMIP/EUR_OCEANS/IMBER/GREENCYCLES II workshop "Impact of climate change on marine ecosystems", Université Pierre et Marie Curie, Paris, France, March 2013.

Consistent global responses of marine ecosystems to future Climate Change across the IPCC AR5 Earth System Models, A. Cabre, **I. Marinov**, S. Leung and R. Bernardello (oral by postdoc Cabre) MAREMIP/EUR_OCEANS/IMBER/GREENCYCLES II workshop "Impact of climate change on marine ecosystems", Université Pierre et Marie Curie, Paris, France, 4-6 March 2013.

Response of Ocean Ecology to Climate Change: an initial IPCC AR5 Earth System Model intercomparison, A. Cabre, S. W. Leung, **I. Marinov**, R. Bernardello. American Geophysical Union Fall Meeting, San Francisco, CA, December 2012. (oral OS11F-06 by postdoc Cabre)

Predicting Southern Ocean carbon uptake in a warming climate (oral, invited) **I. Marinov**, R. Bernardello, Jaime B. Palter, Jorge L. Sarmiento. US CLIVAR/OCB Working Group Meeting « Southern Ocean heat and carbon uptake », San Francisco, CA, December 2012.

Predicting ocean carbon uptake in a warming climate: novel tracers and modeling approaches (oral B11E-08) **I. Marinov**, R. Bernardello, Jaime B. Palter, Jorge L. Sarmiento, American Geophysical Union Fall Meeting, San Francisco, CA, December 2012.

Response of Southern Ocean Ecology to Climate change (oral, invited) **Marinov**, A. Cabre and S. Leung, Symposia on Southern Ocean Biogeochemistry (SOBOM), Princeton University, Princeton, NJ. 15-16 Oct 2012.

Compensating responses of the ocean carbon pumps to ocean circulation changes over the 21st century (poster) R. Bernardello, **I. Marinov**, J. Palter, J.L. Sarmiento. Ocean Carbon and Biogeochemistry Summer Workshop, Woods Hole Oceanographic Institution, MA, July 16-19, 2012.

Ocean carbon storage in the 21st century: increase or decrease? (invited talk) NOAA Climate & Global Change Postdoctoral Fellowship Program Summer Institute, Steamboat Spring, Colorado, 8-12 July 2012.

Response of the ocean carbon pumps to changes in ocean circulation in 21st century climate change simulations (poster) R. Bernardello, **I. Marinov**, Palter J.B. and J.L. Sarmiento. TOS/ASLO/AGU Ocean Sciences Conference, Salt Lake City, Utah, February 2012.

The response of ocean ecology to climate change: an IPCC AR5 Earth System Model inter-comparison (oral) **Marinov**, A. Cabre, S. Leung, R. Bernardello and J. Russell. TOS/ASLO/AGU Ocean Sciences Conference, Salt Lake City, Utah, February 2012.

Predicting the behavior of ocean ecology in a changing climate: theory and coupled model intercomparison by **I. Marinov**, R. Shor, A. Gnanadesikan and J. Dunne, Poster at the WCRP Open Science Conference, Denver, USA. October 24-28, 2011. **Best young scientist poster award.**

How sustainable agriculture can improve groundwater quality: a model study for a soil and aquifer pollution case, paper SDEWES11-0762 by and **I. Marinov** and Marinov, A.M. (oral by A. Marinov), 6th Dubrovnik conference on sustainable development of energy, water and environ. systems, Croatia, Sept 2011.

Spring bloom dynamics and variability of export production: a Mediterranean Sea case study (poster)
Bernardello, R., G. Cardoso, D. Donis, N. Bahamon, **I. Marinov** and A. Cruzado. Ocean Carbon and Biogeochemistry Summer Workshop, Woods Hole Oceanographic Institution, July 2011.

Predicting the behavior of ocean ecology in a changing climate: from simple theory to global climate models. (invited talk). "Ocean Ecologies and their Physical Habitats in a Changing Climate" summer school at the Mathematical Biosciences Institute, The Ohio State University. June 20 - July 1, 2011.

Participant, Climate Processing Team on Southern Ocean Biogeochemistry Meeting, Princeton, NJ, June 27th 2011.

Ocean ecology in a warmer world and consequences for the carbon cycle (invited talk)
 20th Anniversary Celebration of the NOAA Climate and Global Change Postdoctoral Fellowship Program, NOAA Science Center and Auditorium, Silver Spring, MD, April 14th 2011.

How does nutrient limitation in the upper ocean influence the global carbon cycle? (invited Speaker and chapter writer)
 Workshop on *Upper Ocean Nutrient Limitation: Processes, Patterns and Potential for Change*, National Oceanography Center in Southampton, UK, Nov 2nd-7th 2010.

Ocean Biological Pump: sensitivity to climate change and impacts on atmospheric CO₂ (invited talk)
 PCC Summer Institute "Climate Feedbacks", Program on Climate Change, U. of Washington, Sept 14-17 2010.

Oceanic controls on atmospheric pCO₂: the coupled roles of Southern Ocean biology, air-sea CO₂ disequilibrium and anthropogenic emissions. R. Zarzu and **I. Marinov**. (Poster ITL45L-08 presented by student R. Zarzu). Ocean Science conference, Portland, Oregon, Feb 2010.

Sensitivity of Atmospheric pCO₂ to Changes in the Biological Pump: Does Anthropogenic CO₂ Matter? (poster)
 Chapman Conference on the Biological Carbon Pump of the Oceans, Brockenhurst, England, 1-4 Sept. 2009.

Response of ocean plankton ecology and carbon cycle to climate change over the 21st century (poster)
 Ocean Carbon and Biogeochemistry Summer Workshop, Woods Hole Oceanographic Institution, July 2009.

Participant and speaker, Ocean Carbon and Biogeochemistry (OCB) scoping workshop « New Frontiers in Southern Ocean Biogeochemistry and Ecology Research », Princeton, NJ. June 8-11 2009.

Why should we care about changes in ocean carbon? (invited talk)
 AR-5 Modeling Workshop, Goddard Institute for Space Studies, New York, NY, November 2009.

The role of ocean biology in setting atmospheric pCO₂: the preformed nutrient theory (invited talk PP43D-02)
 American Geophysical Union Fall Meeting, San Francisco, CA. December 2008.

Response of plankton ecology and the carbon cycle to climate change over the 21st century (poster OS31A-1237)
 American Geophysical Union Fall Meeting, San Francisco, CA. December 2008.

Changes in ocean ecology over the 21st century (oral)
 IMBER IMBIZO meeting on *Integrating biogeochemistry and ecosystems in a changing ocean*, Miami, Nov 2008.

Preformed nutrients: a key metric for understanding the oceanic biological pump (oral)
 Southern Ocean Climate Process Team Meeting, Woods Hole Oceanographic Institution, July 2008.

The impact of circulation on the biological carbon storage in the ocean and on atmospheric pCO₂, (invited talk)
 NOAA Global and Climate Change Postdoctoral Fellowship Program, 7th Summer Institute, July 2006.

What determines the outcome of surface nutrient depletion? (oral)
 Canadian Meteorological and Oceanographic Society (CMOS) annual meeting, Toronto, June 2006.

Why the Antarctic is crucial for atmospheric CO₂ and the Subantarctic for global oceanic biological production: the importance of circulation (poster), Ocean Sciences Meeting, Hawaii, February 2006.

The Southern Ocean biogeochemical divide, talks at:
 Princeton/GFDL Cooperative Institute on Climate Science (CICS) Carbon Meeting, Princeton, June 2005.
 ASLO Summer Meeting, Santiago de Compostela, Spain, June 2005.

Atmospheric carbon dioxide and oceanic biological production, is there a link? (invited talk)
 NOAA Climate and Global Change Postdoctoral Program Meeting, Washington DC, April 2005.

Atmospheric carbon dioxide and global biological production, (oral)
 U.S. JGOFS Synthesis & Modeling Project PI Workshop, WHOI, Woods Hole, MA, July 2004.

Large-scale nutrient depletion: mechanisms and sensitivity to mixing, Ocean Sciences Meeting, Honolulu, Hawaii, Feb 2002 (oral)

Pre-industrial air-sea CO₂ fluxes and sensitivity to oceanic mixing (poster)
 Global Change Science Conference, Amsterdam, Holland, July 2001 and U.S. JGOFS Synthesis & Modeling Project Principal Investigator's Workshop, WHOI, Woods Hole, MA, July 2001.