

# Curriculum Vitae for María Josefina Olascoaga\*

## Personal Data

Address RSMAS/AMP, UMiami, 4600 Rickenbacker Cswy., Miami, FL 33149 USA  
Phone +1-305-421-4873/4701 (voice/fax)  
E-mail jolascoa@rsmas.miami.edu  
Webpage www.rsmas.miami.edu/personal/jolascoaga  
Born July 25, 1970, Buenos Aires, Argentina.  
U.S. Visa Permanent Resident (since 2005)  
Other Married, two children.

## Research Interests

Modeling of biophysical interactions; geophysical flow stability; Lagrangian dynamics.

## Education

1997–2001 Sc.D., Phys. Oceanogr., CICESE, Ensenada, BC, Mexico. (Advisor: P. Ripa.<sup>†</sup>)  
1994–1997 M.Sc., Phys. Oceanogr., CICESE, Ensenada, BC, Mexico. (Advisor: J. Sheinbaum.)  
1989–1994 Licentiate, Oceanogr., ITBA, Bs. As., Argentina. (Advisor: L. Romanelli.)

## Positions Held

2008– Assistant Professor, RSMAS, UMiami.  
2004–2008 Assistant Scientist, RSMAS, UMiami.  
2001–2004 Postdoctoral Research Associate, RSMAS, UMiami. (Advisors: S. Smith, M. Brown, D. Olson, and E. Chassignet)  
1998–2000 Graduate Research Assistant, CICESE, Ensenada, BC, Mexico.

## Awards

2001 Francisco Medina Martinez Award to the Best Thesis in Earth Sciences, UGM, Mexico.  
1999 Aosta Summer School in Geophys. and Astrophys. Fluid Dyn. Fellowship, Italy.  
1997–2000 SNI Graduate Research Fellowship, Mexico.  
1994 Silver Medal for Outstanding Fellowship, ITBA, Bs. As., Argentina.

## Professional Service

Reviewer Book chapters (*Lagrangian Analysis and Prediction of Coastal and Ocean Dynamics*)  
Research proposals (National Science Foundation)  
Member American Geophysical Union (since 1996)

## Research Grants

FY08–FY11 NSF, CMG-0825547: Nonintegrable Hamiltonian systems in geophysical fluid dynamics. Beron-Vera, F. J. (PI); **M. J. Olascoaga** and H. Koçak (Co-PIs); M. Brown (Senior Personnel). \$725K. Pending.

\*As of April 14, 2008.

<sup>†</sup>Deceased October 3, 2001.

- FY08–FY11 NASA, N7-PO07-0026: Objective identification and tracking of mesoscale eddies, and their role in interbasin, interhemispheric, and regional exchanges. Beron-Vera, F. J. (PI); **M. J. Olascoaga** and G. J. Goni (co-PIs), \$597K. Pending.
- FY08–FY10 NOAA–OHHI, GRANT00376002: “Identification of the origin and pathways of harmful algal blooms on the West Florida Shelf with the use of Lagrangian coherent structures,” **M. J. Olascoaga** (PI), L. E. Brand (co-PI) and F. J. Beron-Vera (co-PI), \$445K. Pending.
- FY08–FY10 ECOHAB, EPA-G2008-STAR-A1: “Tracing the early development stages of harmful algal blooms on the West Florida Shelf with the aid of Lagrangian coherent structures,” **M. J. Olascoaga** (PI), L. E. Brand (co-PI) and F. J. Beron-Vera (co-PI), \$450K. Pending.
- FY07–FY09 NSF, OCE-0648284: “Finite-amplitude upper-ocean baroclinic instability,” **M. J. Olascoaga** (PI), \$375K. Current.
- FY07 NSF–NIEHS UM OHHC Pilot Project: “Circulation constraints on *Karenia brevis* blooms on the West Florida Shelf,” **M. J. Olascoaga PI**, \$10K. Current.
- FY04–FY08 NSF, CMG-0417425: “Nonintegrable Hamiltonian systems in ocean dynamics,” F. J. Beron-Vera (PI) and **M. J. Olascoaga** (Co-PI), \$995K. Current.

## Teaching Experience

- 2001 Dynamical Oceanography III (Lab.), CICESE, Mexico.
- 1999 Mathematical Methods I (Lab.), CICESE, Mexico.
- 1998 Mathematical Methods I (Lab.), CICESE, Mexico.
- 1997 Dynamical Oceanography II (Lab.), CICESE, Mexico.

## Ph.D. Thesis Committees

- I. Rypina, S. Gremes-Cordero (RSMAS/AMP, U. Miami)

## Field Experience

- 1999 Graduate student on the oceanographic cruise “Canek IV: Caribbean Sea and Gulf of Mexico,” CICESE, Mexico.
- 1998 Graduate student on the oceanographic cruise “Canek II: Caribbean Sea and Gulf of Mexico,” CICESE, Mexico.
- 1994 Graduate student on the oceanographic cruise “FU9412: Gulf of California,” CICESE, Mexico.

## Research Articles

### Published and Submitted

16. Beron-Vera, F. J. and **M. J. Olascoaga** (2008). An assessment of the importance of chaotic stirring and turbulent mixing in the West Florida Shelf. *J. Phys. Oceanogr.*, submitted.
15. Beron-Vera, F. J., **M. J. Olascoaga**, and G. J. Goni (2008). Lagrangian coherent structures and transport by mesoscale oceanic vortices, *Geophys. Res. Lett.*, submitted.
14. **Olascoaga, M. J.**, F. J. Beron-Vera, L. E. Brand, and H. Kocak (2008). Tracing the early development of harmful algal blooms with the aid of lagrangian coherent structure, *J. Geophys. Res.*, submitted.
13. Beron-Vera, F. J., M. G. Brown, **M. J. Olascoaga**, I. I. Rypina, H. Koçak, and I. A. Udovydchenkov (2008). Zonal jets as transport barriers in planetary atmospheres, *J. Atmos. Sci.*, in press (e-Print arXiv:0803.2893v1).

12. Rypina, I. I., M. G. Brown, F. J. Beron-Vera, H. Koçak, **M. J. Olascoaga** and I. A. Udovydchenkov (2007). Robust transport barriers resulting from strong Kolmogorov–Arnold–Moser stability, *Phys. Rev. Lett.*, **98**: 104102.
11. Rypina, I. I., F. J. Beron-Vera, M. G. Brown, H. Kocak, **M. J. Olascoaga** and I. A. Udovydchenkov (2007). On the Lagrangian Dynamics of Atmospheric Zonal Jets and the Impermeability of the Stratospheric Polar Vortex, *J. Atmos. Sci.*, **64**, 3595–3610.
10. **Olascoaga, M. J.**, I. I. Rypina, M. G. Brown, F. J. Beron-Vera, H. Kocak, L. E. Brand, G. R. Halliwell, and L. K. Shay (2006). Persistent Transport Barrier on the West Florida Shelf. *Geophys. Res. Lett.*, **33**: L22603.
9. Rothstein, L., M. Abbott, E. Chassignet, J. Cullen, K. Denman, S. Doney, H. Ducklow, K. Fennel, M. Follows, D. Haidvogel, E. Hofmann, D. Karl, J. Kindle, I. Lima, M. Maltrud, C. McClain, D. McGillicuddy, **J. Olascoaga**, Y. Spitz, J. Wiggert, and J. Yoder (2006). Modeling Ocean Ecosystems: The PARADIGM Program, *Oceanography*, **19**: 1, 17–45.
8. **Olascoaga, M. J.**, N. Idrisi and A. Romanou (2005). Biophysical isopycnic-coordinate modelling of plankton dynamics in the Arabian Sea, *Ocean Modell.*, **8**: 55–80.
7. Idrisi, N., **M. J. Olascoaga**, Z. Garraffo, D. B. Olson and S. L. Smith (2004). Mechanisms for emergence from diapause of *Calanoides carinatus* in the Somali Current, *Limnol. Oceanogr.* **49**: 1,262–1,268.
6. Beron-Vera, F. J., **M. J. Olascoaga** and J. Zavala-Garay (2004). Linear waves and baroclinic instability in a inhomogeneous-density layered primitive-equation ocean model, *ICTAM04 Abstract Book and CD-ROM Proceedings*, ISBN 83-89687-01-1, IPPT PAN, Warsaw, to appear (e-Print arXiv:physics/0401078).
5. **Olascoaga, M. J.**, F. J. Beron-Vera and J. Sheinbaum (2003). Deep ocean influence on upper ocean baroclinic instability saturation, in O. U. Velasco-Fuentes et al. (eds.), *Nonlinear Processes in Geophysical Fluid Dynamics: A Tribute to the Scientific Work of Pedro Ripa*, Kluwer Academic, pp. 15–28.
4. Beron-Vera, F. J., **M. J. Olascoaga** and M. G. Brown (2003). Passive tracer patchiness and particle trajectory stability in incompressible two-dimensional flows, *Nonlin. Proc. Geophys.*, **11**: 67–74.
3. Beron-Vera, F. J. and **M. J. Olascoaga** (2003). Spectral, formal, and nonlinear stability in a layered quasigeostrophic model with application to the Atlantic North Equatorial Current, in P. Malanotte-Rizzoli and G. J. Goni (eds.), *Interhemispheric Water Exchange in the Atlantic Ocean*, Elsevier Oceanography Series 68, Elsevier Science, pp. 313–334.
2. **Olascoaga, M. J.** (2001). Deep ocean influence on upper ocean baroclinic instability, *J. Geophys. Res.* **106**: 26,863–26,877.
1. **Olascoaga, M. J.** and P. Ripa (1999). Baroclinic instability in a two-layer model with a free boundary and  $\beta$ , *J. Geophys. Res.* **104**: 23,357–23,366.

## In Preparation

1. **Olascoaga, M. J.**, F. J. Beron-Vera, H. Koçak and M. G. Brown (2008). The effects of Lagrangian vs. population dynamics in plankton patchiness generation. *Physica D*, to be resubmitted (e-Print arXiv:nlin.CD/0606065).

## Unpublished

2. Olascoaga, M. J. (2001). *Inestabilidad baroclínica de la capa superior del océano (Upper Ocean Baroclinic Instability)*, ScD thesis, CICESE, Ensenada, BC, Mexico.

1. Olascoaga, M. J. (1994). *Análisis dinámico de El Niño (Dynamical Analysis of El Niño)*, Licentiate thesis, ITBA, Bs. As., Argentina.

## Seminars and Meeting Presentations

### Invited Seminars

5. Lagrangian Coherent Structures: An Application to Red Tide Dynamics, U. Louisville, Math Department, Louisville, KY, USA, June, 2007.
4. Tracing the origin of harmful algal blooms with the aid of lagrangian coherent structure, U. Toronto, Department of Physics, Toronto, Canada, June, 2007.
3. Lagrangian coherent structures and red tides, U. Miami, Department of Computer Science, Miami, FL, November, 2006.
2. Deep ocean influence on upper ocean baroclinic instability, Woods Hole Oceanographic Institution, Physical Oceanography Department, Woods Hole, MA, USA, May, 2003.
1. Modelling of biophysical interactions in the Arabian Sea, Woods Hole Oceanographic Institution, Applied Ocean Physics and Engineering Department, Woods Hole, MA, USA, May, 2003.

### Invited Meeting Presentations

4. **Olascoaga, M. J.** and F. J. Beron-Vera (2008). On the nature of the surface ocean Lagrangian dynamics in the West Florida Shelf, 2008 Joint Assembly, Ft. Lauderdale, Florida, USA, May.
3. Beron-Vera, F. J., M. G. Brown and **M. J. Olascoaga** (2005). Sistemas hamiltonianos no integrables en física oceánica (Nonintegrable Hamiltonian systems in ocean physics), XXVII Congreso Nacional de la Sociedad Matemática Mexicana (27th National Congress of the Mexican Mathematical Society), Ensenada, Baja Cfa., Mexico, October.
2. **Olascoaga, M. J.** and F. J. Beron-Vera (2002). Baroclinic instability in a three-layer quasi-geostrophic model with application to the Atlantic North Equatorial Current, Pedro Ripa Memorial Colloquium on “Nonlinear Processes in Geophysical Fluid Dynamics,” Ensenada, BC, Mexico, October. (Presented by J. Sheinbaum.)
1. Idrisi, N., **M. J. Olascoaga**, Z. Garraffo, D. B. Olson and S. L. Smith (2002). Patterns of dispersion and fate of deep hibernating Copepods, UMichigan, Ann Arbor, MI, USA, September.

### Contributed Meeting Presentations

24. Beron-Vera, F. J., **M. J. Olascoaga** and G. J. Goni (2008). Mesoscale vortices as revealed by Lagrangian coherent structures. Ocean Sci. Meet., Orlando, FL, March.
23. **Olascoaga, M. J.**, F. J. Beron-Vera, L. E. Brand and H. Koçak (2008). An application of Lagrangian coherent structures to harmful algal blooms. Ocean Sci. Meet., Orlando, FL, March.
22. Beron-Vera, F. J., M. G. Brown, **M. J. Olascoaga**, I. I. Rypina, H. Koçak and I. A. Udovydchenkov (2007). Zonal jets as transport barriers in planetary atmospheres. *Eos Trans. AGU* **88**(52), Fall Meet. Suppl., Abstract P51A-0202, San Francisco, CA, December.
21. Rypina, I. I., M. G. Brown, F. J. Beron-Vera, H. Kocak, **M. J. Olascoaga** and I. A. Udovydchenkov (2007). On the Lagrangian dynamics of atmospheric zonal jets and the impermeability of the stratospheric polar vortex. *Eos Trans. AGU* **88**(52), Fall Meet. Suppl., Abstract A51F-11, San Francisco, CA, December.

20. Beron-Vera, F. J., **M. J. Olascoaga**, I. I. Rypina, M. G. Brown, H. Koçak and I. A. Udovychenkov (2007). On the Lagrangian dynamics of atmospheric zonal jets and the permeability of the stratospheric polar vortex. AGU Chapman Conference on “The Role of the Stratosphere in Climate and Climate Change,” Santorini, Greece, September.
19. **Olascoaga, M. J.**, I.I. Rypina, M.G. Brown, F.J. Beron-Vera, H. Koçak, L.E. Brand, G.R. Halliwell and L.K. Shay (2006). Persistent Transport Barrier on the West Florida Shelf, 2006 HYCOM Workshop, Tallahassee, FL, USA, November.
18. **Olascoaga, M. J.**, S. de Rada, J. Kindle and E. Chassignet (2006). Biophysical modeling of the California Current System, 2006 HYCOM Workshop, Tallahassee, FL, USA, November.
17. **Olascoaga, M. J.**, and F. J. Beron-Vera (2006). Fluid particle clustering as a mechanism for plankton patchiness, *Eos Trans. AGU* **87** (36), Ocean Sci. Meet. Suppl., Abstract OS36H-06, Honolulu, Hawaii, USA, February.
16. Beron-Vera, F. J., and **M. J. Olascoaga** (2006). Nonlinear evolution of baroclinically unstable near-surface zonal jets, *Eos Trans. AGU* **87** (36), Ocean Sci. Meet. Suppl., Abstract OS45L-02, Honolulu, Hawaii, USA, February.
15. Beron-Vera, F. J., **M. J. Olascoaga** and J. Zavala-Garay (2004). Linear waves and baroclinic instability in a inhomogeneous-density layered primitive-equation ocean model, 21st International Congress of Theoretical and Applied Mechanics (ICTAM), Warsaw, Poland, August.
14. **Olascoaga, M. J.**, E. P. Chassignet, J. Kindle and A. Wallcraft (2004). Sensitivity of biophysical modeling to model’s vertical coordinate representation, ASLO Ocean Sciences Meeting, Honolulu, Hawaii, USA, February.
13. Beron-Vera, F. J., **M. J. Olascoaga** and J. Zavala-Garay (2004). How much can we do with only a few layers?, 2004 LOM Workshop, Miami, FL, USA, February.
12. Beron-Vera, F. J., **M. J. Olascoaga** and M. G. Brown (2002). Particle trajectory stability and tracer patchiness in 2D incompressible flows, II LAPCOD Meeting, Key Largo, FL, USA, December.
11. Idrisi, N. and **M. J. Olascoaga** (2002). Lagrangian modeling of diapaused Copepods in intermediate to deep layers in the Arabian Sea, II LAPCOD Meeting, Key Largo, FL, USA, December.
10. **Olascoaga, M. J.**, N. Idrisi, A. Romanou, D. B. Olson and S. L. Smith (2002). Biophysical modeling of plankton dynamics off Somalia and Oman, *EOS* **83** (4): OS58, AGU/ASLO Ocean Sciences Meeting, Honolulu, Hawaii, USA, February.
9. Idrisi, N., **M. J. Olascoaga** and S. L. Smith (2002). Translocation of diapausing Calanoides carinatus in the mesopelagic/deep layers in the Arabian Sea: Modeling Lagrangian particle drift in an isopycnic ocean model, *EOS* **83** (4): OS38, AGU/ASLO Ocean Sciences Meeting, Honolulu, Hawaii, USA, February.
8. Ripa, P., **M. J. Olascoaga** and F. J. Beron-Vera (2001). Generalization of the classical baroclinic instability problems, Waves Phenomena III, Edmonton, Canada, June.
7. **Olascoaga, M. J.** and P. Ripa (2000). Deep ocean influence on upper ocean baroclinic instability, *Bol. Soc. Mex. Fís.* **14** (3): 152, XXXIX Mexican Congress of Physics, Puebla, Pue., Mexico, October.
6. **Olascoaga, M. J.** and P. Ripa (2000). Baroclinic instability in a two-layer model with a free boundary and  $\beta$  effect, *EOS* **80** (49): OS35, AGU/ASLO Ocean Sciences Meeting, San Antonio, TX, USA, January.

5. **Olascoaga, M. J.** and P. Ripa (1999). Free boundary effects on baroclinic instability. Part II: Two-layer model on the  $\beta$ -plane, Aosta Summer School in Geophysical and Astrophysical Fluid Dynamics on “Transport and Mixing in Geophysical Flows,” St. Oyen, Aosta, Italy, June.
4. **Olascoaga, M. J.** and P. Ripa (1998). Earth’s curvature effects on baroclinic instability in the upper ocean layer, *GEOS 18*, Mexican Geophysical Union Annual Meeting, Puerto Vallarta, Jal., Mexico, November.
3. **Olascoaga, M. J.** and P. Ripa (1998). Nonlinear aspects on Phillips’ problem of baroclinic instability with a free boundary, XI National Congress of Oceanography, Ensenada, B.C., Mexico, April.
2. **Olascoaga, M. J.** and P. Ripa (1997). Free boundary effects on Phillips’ problem of baroclinic instability, *GEOS 17*, Mexican Geophysical Union Annual Meeting, Puerto Vallarta, Jal., Mexico, November.
1. **Olascoaga, M. J.** and J. Sheinbaum (1996). Determination of suitable open boundary conditions for a simplified ocean using data assimilation techniques, *Bol. Soc. Mex. Fís.* **10**, XXXIX National Congress of Physics, Oaxaca, Oax., Mexico, October.

## References

- |                    |   |
|--------------------|---|
| Michael G. Brown   | U. Miami/RSMAS/AMP<br>4600 Rickenbacker Cswy., Miami, FL 33149, USA<br>+1-305-361-4640, mbrown@rsmas.miami.edu                            |
| Eric P. Chassignet | Florida State U./COAPS, Director<br>200 RM Johnson Bldg., Rm 207, Tallahassee, FL 32306-2840<br>+1-850-644-4581, chassignet@ocean.fsu.edu |
| Donald B. Olson    | U. Miami/RSMAS/MPO<br>4600 Rickenbacker Cswy., Miami, FL 33149, USA<br>+1-305-361-4074, dolson@rsmas.miami.edu                            |
| Huseyin Koçak      | U. Miami/Computer Science, Chair<br>1365 Memorial Dr., Ungar Bldg. 515, Coral Gables, FL 33146, USA.<br>1-305-284-3138, hk@cs.miami.edu   |
| Julio Sheinbaum    | CICESE/DOF<br>PO Box 434844, San Diego, CA 92143-4844, USA<br>+52-646-174-0500 x24052, julios@cicese.mx                                   |
| Sharon L. Smith    | U. Miami/RSMAS/MBF<br>4600 Rickenbacker Cswy., Miami, FL 33149, USA<br>+1-305-421-4819, ssmith@rsmas.miami.edu                            |