

Curriculum Vitae

Mercedes Pascual

Department of Ecology and Evolutionary Biology
University of Michigan
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Academic Training

Postdoctoral, Ecology and Evolutionary Biology, Princeton University, Princeton, NJ (1995-97)
Ph.D, Biological Oceanography, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program, Woods Hole, MA (1989-95)
M.Sc., Mathematics, New Mexico State University, Las Cruces NM (1987-89)
Second Autumn Course on Mathematical Ecology, International Center for Theoretical Physics, Trieste, Italy (1986)
Visiting Student, Section of Ecology and Systematics, Cornell University, Ithaca, NY (1985-86)
Licenciatura Degree, Biology, Universidad de Ciencias Exactas y Naturales, Buenos Aires, Argentina (1985)
Undergraduate Student, Mathematics, P.U.C. University, Rio de Janeiro, Brazil (1980) and Marine Biology, U.S.U. University, Rio de Janeiro, Brazil (1978-79)

Professional Experience

Rosemary Grant Collegiate Professor, Department of Ecology and Evolutionary Biology, and Center for Computational Biology and Bioinformatics, University of Michigan, Ann Arbor, MI (September 2008 - present)
Investigator, Howard Hughes Medical Institute (September 2008 - present)
Associate Professor, Department of Ecology and Evolutionary Biology, University of Michigan, Ann Arbor, MI (June 2004 - August 2008)
Assistant Professor, Department of Ecology and Evolutionary Biology, University of Michigan, Ann Arbor, MI (January 2001- May 2004)
External faculty, Santa Fe Institute, Santa Fe, NM (April 2003 - present)
Invited Professor, Ecole Normale Supérieure, Paris (June 2006 and June 2007)
Adjunct Scientist, Biology Department, WHOI, Woods Hole, MA (1999-2001)
Research Assistant Professor, Center of Marine Biotechnology, University of Maryland Biotechnology Institute, Baltimore, MD (1997-2000)
Affiliated Faculty, Program on Health Effects of Global Environmental Change, Johns Hopkins University, MD (1997-2000)

Affiliate Research Assistant Professor, Department of Zoology, University of Maryland, College Park, MD (1997-1998)

Visiting Scholar, Center of Environmental and Applied Fluid Mechanics, Johns Hopkins University, MD (1997)

Graduate Research Assistant, Biology Department, WHOI, Woods Hole, MA (1989-95)

Awards and Recognition

Division R (Evolutionary and Genomic Microbiology) Lecturer, American Society for Microbiology (San Diego, CA) (2010)

Howard Hughes Medical Institute, new investigator (2008)

Collegiate Professor, University of Michigan (2008)

Faculty Recognition Award, University of Michigan (2004)

Fellow of the American Association for the Advancement of Science (2003)

Discover Magazine: Top 50 Women in Science (2003)

James S. McDonnell Centennial Fellowship in Global and Complex Systems (1999-2008)

U.S. Department of Energy Alexander Hollaender Distinguished Postdoctoral Fellowship (1995-97)

Ocean Ventures Fund Award, MIT/WHOI Joint Graduate Program (1991-95)

Manuscripts

Cash B., X. Rodo, J. Ballester, M.J. Bouma and **M. Pascual**. Malaria epidemics highlight the influence of the Tropical South Atlantic on the Indian monsoons. *submitted*.

Artzy, Y., M. Rorick, K. Day, D. Chen, A. Dobson, **M. Pascual**. Structuring of malaria parasite populations through epidemiological feedbacks on multi-copy antigen encoding genes. *submitted*.

Artzy, Y. and **M. Pascual**. Composite temporal strategies in pathogen evolution: balancing invasion and persistence. *The American Naturalist*. *submitted*.

Bedford, T., A. Rambaut and **M. Pascual**. Canalization of the evolutionary trajectory of the human influenza virus. *BMC Biology* *in press*.

Roy, M., R. Zinck, M. Bouma, and **M. Pascual**. Epidemic cholera spreads like fire. *in preparation*.

Zinder, D., T. Bedford, S. Gupta and **M. Pascual**. The roles of competition and mutation in shaping antigenic and genetic diversity in influenza. *in preparation*.

Publications

Reiner, R.C., A. King, M. Emch, Md. Yunus, A.S.G. Faruque and **M. Pascual**. 2012. Highly localized sensitivity to climate forcing drives endemic cholera in a megacity. *PNAS* 109:6 2033-2036.

Baskerville, E., A. Dobson, T. Bedford, S. Allesina and **M. Pascual**. 2011. Spatial guilds in the Serengeti food web revealed by a Bayesian group model. *PloS Computational Biology* 7(12): e1002321. doi:10.1371/journal.pcbi.1002321.

Bouma, M.J., A. Baeza, A. terVeen and **M. Pascual**. 2011. Global malaria maps and climate change: a focus on East African highlands. *Trends in Parasitology*. 27 (10):421-422.

- Zinck, R., **M. Pascual** and V. Grimm. 2011. Understanding shifts in wildfire regimes as emergent threshold phenomena. *The American Naturalist*. 178:6 doi: 10.1086/662675.
- Baeza, A., M. Bouma, A. Dobson, R. Dhiman and **M. Pascual**. 2011. Climate forcing and epidemic malaria in desert regions of India: the effect of irrigation. *Malaria Journal* 10:190. doi: 10.1186/1475-2875-10-190.
- Bedford, T., S. Cobey and **M. Pascual**. 2011. Strength and tempo of selection revealed in viral gene genealogies. *BMC Evolutionary Biology*. 11:220.
- Pascual, M.**, M. Roy and K. Laneri. 2011. Simple models for complex systems: exploiting the relationship between local and global densities. *Theoretical Ecology* 4:211-222. doi:10.1007/s12080-011-0116-2.
- Cobey, S. and **M. Pascual**. 2011. Consequences of host heterogeneity, epitope immunodominance, and immune breadth for strain competition. *Journal of Theoretical Biology*. 270(1): 80-87. doi: 10.1016/j.jtbi.2010.11.009.
- Kefi, S., M. Rietkerk, P.C. de Ruiter, M. Roy, A. Franc, and **M. Pascual**. 2011. General indicators of extinction thresholds in spatial ecologies. *Ecology Letters* 14: 29-35. doi: 10.1111/j.1461-0248.2010.01553.x
- Alonso, D., M. Bouma and **M. Pascual**. 2011. Epidemic malaria and warmer temperatures in recent decades in an East African highland. *Proceedings of the Royal Society B* 278(1712):1661-9. doi: 10.1098/rspb.2010.2020.
- Cobey, S., **M. Pascual**, and U. Dieckmann. 2010. Ecological factors driving the long term evolution of influenza's host range. *Proceedings of the Royal Society of London* 227(1695): 2803-2810.
- Laneri, K., A. Bhadra, E. Ionides, M.J. Bouma, R. Dhiman, R. Yadav and **M. Pascual**. 2010. Forcing vs. feedback: epidemic malaria and monsoon rains in NW India. *PLoS Comput Biol* 6(9): e1000898. doi: 10.1371/journal.pcbi.1000898.
- Artzy, Y., D. Alonso and **M. Pascual**. 2010. Transmission intensity and drug resistance in malaria population dynamics: implications for climate change. *PLoS One* 5(10): e13588. doi: 10.1371/journal.pone.0013588.
- Warren, C., **M. Pascual**, K.D. Lafferty, and A. Kuris. 2010. The inverse niche model for food webs with parasites. *Theoretical Ecology*, 3(4): 285-294. doi: 10.1007/s12080-009-0069-x.
- Bedford, T., S. Cobey, P. Beerli and **M. Pascual**. 2010. Global migration dynamics underlie evolution and persistence of human influenza A (H3N2). *Plos Pathogens* 6(5): 1-9.
- Allesina, S. and **M. Pascual**. 2009. Googling food webs: can an eigenvector measure species' importance for co-extinctions? *PloS Computational Biology* 5(9): 1-6.
- Chaves, L.F., A. Kaneko, A. Bjorkman, and **M. Pascual**. 2009. Random, top-down or bottom-up co-existence of parasites: malaria population dynamics in multi-parasitic settings. *Ecology* 90(9): 2414-2425.
- Pascual, M.**, A.P. Dobson, and M.J. Bouma. 2009. Underestimating malaria risk under variable temperatures. *PNAS* (Early Edition, August 14th), *invited commentary*.
- Allesina, S. and M. Pascual. 2009. Food web models: a plea for groups. *Ecology Letters* 12(7): 652-662.
- Dobson, A., S. Allesina, K. Lafferty and **M. Pascual** (eds.). 2009. Food web assembly and collapse:

mathematical models and implications for conservation. Theme Issue. Philosophical Transactions of the Royal Soc. London B., Vol. 364 (1524).

- Pascual, M.** and M.J. Bouma. 2009. Do rising temperatures matter? *Ecology* 90(4): 906-912.
- Koelle, K. and **M. Pascual**. 2009. Understanding the dynamics of rapidly evolving pathogens through modeling the tempo of antigenic change: influenza as a case study. *Epidemics* 1(2): 129-137.
- Allesina, S., A. Bodini and **M. Pascual**. 2009. Functional links and robustness in food webs. Philosophical Transactions of the Royal Soc. London B. Theme Issue on Food Web Assembly and Collapse: Mathematical Models and Implications for Conservation, Vol. 364 (1524): 1701:1709.
- King, A.A., E.L. Ionides, **M. Pascual**, M.J. Bouma. 2008. Inapparent infections and cholera dynamics. *Nature* 454(7206): 877-880.
- Allesina, S., D. Alonso, and **M. Pascual**. 2008. A general model of food web structure. *Science* 320: 658-661.
- Pascual, M.**, L.F. Chaves, X. Rodo, B. Cash and Md. Yunus. 2008. Predictability of endemic cholera: the role of climate variability and disease dynamics. *Climate Research* 136: 131-140.
- Lafferty, K. *et al.* (15 authors). 2008. Parasites in food webs: the ultimate missing link. *Ecology Letters (Ideas and Perspectives)* 11(6): 533-546.
- Pascual, M.**, B. Cazelles, M.J. Bouma, L.F. Chaves, and K. Koelle. 2008. Shifting patterns: malaria dynamics and climate variability in an East African highland. *Proc. R. Soc. London B* 275(1631): 123-132.
- Chaves, L.F., J.M. Cohen, **M. Pascual**, and M. Wilson. 2008. Social exclusion modifies climate and deforestation impacts on a vector-borne disease. *PLoS Neglected Tropical Diseases* 2(2): 1-8.
- Allesina, S. and **M. Pascual**. 2008. Network structure, predator-prey modules, and stability in large food webs. *Theoretical Ecology*. 1:55-64. (doi: 10.1007/s12080-007-0007-8).
- Chaves, L.F., and **M. Pascual**. 2007. Comparing models for early warning systems of neglected tropical diseases. *PLoS Neglected Tropical Diseases* 1: e33.
- Chaves, L.F., M.J. Hernandez, A.P. Dobson, and **M. Pascual**. 2007. Sources and sinks: revisiting the criteria for identifying reservoirs in American Cutaneous Leishmaniasis. *Trends in Parasitology* 23: 311-316.
- Ruiz-Moreno, D., **M. Pascual**, M. Bouma and A. Dobson. 2007. Cholera seasonality and rainfall in historical Madras: epidemic and endemic patterns. *EcoHealth*. 4(1): 52-62.
- Aparicio, J. and **M. Pascual**. 2007. Building epidemiological models from R_0 : an implicit treatment of transmission in networks. *Proc. R. Soc. London B* 274: 505-512.
- Koelle, K., S. Cobey, B. Grenfell, and **M. Pascual**. 2006. Epochal evolution shapes the phylogenetics of interpandemic influenza. *Science* 314: 1898-1903.
- Alonso D., A. McKane and **M. Pascual**. 2006. Stochastic amplification in epidemics. *Journal of the Royal Society Interface* 4(14): 575-582.
- Koelle, K., **M. Pascual**, and Md. Yunus. 2006. Serotype cycling in cholera dynamics. *Proceedings of the Royal Soc. London B* 273(1603): 2876-2889.
- Peacor, S.D., S. Allesina, R.L. Riolo, and **M. Pascual**. 2006. Phenotypic plasticity opposes species invasion by altering fitness landscape. *Public Library of Science (PLoS) Biology* 4(11): 2114-2120.

- Alonso, D. and **M. Pascual**. 2006. Comment on "A keystone mutualism drives pattern in a power function". *Science* 313: 1739.
- L.F. Chaves and **M. Pascual**. 2006. Climate cycles and forecasts of Cutaneous Leishmaniasis, a non-stationary vector borne disease. *Public Library of Science (PloS) Medicine* 3(8): 1320-1328. (See commentary by B. Cazelles and S. Hales, *Infectious diseases, climate influences and nonstationarity*, p. 1212).
- Pascual M.**, J. Ahumada, L.F. Chaves, X. Rodó and M. Bouma. 2006. Malaria resurgence in East African Highlands: temperature trends revisited. *PNAS* 103(15): 5829-5834.
- Pascual M.**, Koelle K. and Dobson A.P. 2006. Hyperinfectivity in cholera: a new mechanism for an old epidemiological model? *Public Library of Science (PloS) Medicine* 3(6): 931-932.
- Roy, M. and **M. Pascual**. 2006. On representing network heterogeneities in the incidence rate of simple epidemic models. *Ecological Complexity* 3(1): 80-96.
- Altizer, S., A. Dobson, P. Hosseini, P. Hudson, **M. Pascual** and P. Rohani. 2006. Seasonality and the dynamics of infectious diseases. *Ecology Letters* 9(4): 467-484.
- Vandermeer, J. and **M. Pascual**. 2006. Competitive coexistence through intermediate polyphagy. *Ecological Complexity* 3(1): 37-43.
- Pascual, M.** and J. Dunne (editors). 2005. *Ecological Networks: Linking Structure to Dynamics in Food Webs*. (Proceedings of workshop at the Santa Fe Institute). SFI and Oxford University Press.
- Pascual, M.**. 2005. Computational ecology: from the complex to the simple and back. *Public Library of Sciences, Computational Biology*, 1(2): 101-105.
- Koelle, K., X. Rodó, **M. Pascual**, Md. Yunus, and G. Mostafa. 2005. Refractory periods to climate forcing in cholera dynamics. *Nature* 436(4): 696-700.
- Pascual, M.** and F. Guichard. 2005. Criticality and disturbance in spatial ecological systems. *Trends in Ecology and Evolution* 20(2); 88-95..
- Pascual, M.**, and A. Dobson. 2005. Seasonal patterns of infectious diseases. *Public Library of Sciences (Plos), Medicine* 2(1): 18-19 *Invited commentary*.
- Palmer M.A. *et al.* (19 co-authors from the ESA Visions Committee). 2005. Ecological Science and Sustainability for the 21st century. *Frontiers in Ecology and the Environment* 3(1): 4-12
- Koelle, K., **M. Pascual**, and Md. Yunus. 2005. Pathogen adaptation to seasonal forcing and climate change. *Proc. R. Soc. London B* (doi:10.1098/rspb.2004.3043).
- Boushaba, K. and **M. Pascual**. 2005. Dynamics of the 'echo' effect in a phytoplankton system with nitrogen fixation. *Bulletin of Mathematical Biology* 67(3): 487-507.
- Cole V.J., R.R. Hood, **M. Pascual**, and D.G. Capone. 2004. Modeling the impact of *Trichodesmium* and nitrogen fixation in the Atlantic Ocean. *J. OF Geophysical Research-Oceans* 109(C6) (Art n. C06007).
- Roy, M., **M. Pascual**, and S.A. Levin. 2004. Competitive coexistence in a dynamic landscape. *Theoretical Population Biology* 66: 341-353.
- Koelle, K. and **M. Pascual**. 2004. Disentangling extrinsic from intrinsic factors in disease dynamics: a nonlinear time series approach with an application to cholera. *The American Naturalist*. 163(6): 901-913.

- Coulson, T., P. Rohani, and **M. Pascual**. 2004. Skeletons, noise, and population growth: the end of an old debate. *Trends in Ecology and Evolution* 19(7): 359-364.
- Palmer, M. (and 20 other members of the ESA Visions Committee). 2004. Ecology for a crowded planet. *Science* 304: 1251-1252.
- Harvell, C.D, R. Aronson, N. Baron, J. Connell, A. Dobson, S. Ellner, L. Gerber, K. Kim, A. Kuris, H. McCallum, K. Lafferty, B. McKay, J. Porter, **M. Pascual**, G. Smith, K. Sutherland, J. Ward. 2004. The rising tide of ocean diseases: unsolved problems and research priorities. *Frontiers in Ecology*, 2(7):375-382.
- Roy M., **M. Pascual** and A. Franc. 2003. Broad scaling region in a spatial ecological system. *Complexity*. 8(5): 19-27.
- Pascual, M.** and P. Mazzega. 2003. Quasicycles revisited: apparent sensitivity to initial conditions. *Theoretical Population Biology*. 64(3): 385-395.
- Rodó, X., **M. Pascual**, G. Fuchs, and S. Faruque. 2002. ENSO and cholera: a nonstationary link related to climate change? *Proceedings of the National Academy of Sciences* 99(20): 12901-12906.
- Pascual, M.**, M. Roy, and A. Franc. 2002a. Simple models for ecological systems with complex spatial patterns. *Ecology Letters* 5: 412-419.
- Pascual, M.**, M.J. Bouma, and A. Dobson. 2002. Cholera and climate: revisiting the quantitative evidence. *Microbes and Infection* 4: 237-245.
- Pascual, M.**, M. Roy, F. Guichard, and G. Flierl. 2002b. Cluster size distributions: signatures of self-organization in spatial ecologies. *Philosophical Transactions of the Royal Society of London B* 357: 657-666 .
- J.S. Clark, S.R. Carpenter, M. Barber, S. Collins, A. Dobson, J.A. Foley, D.M. Lodge, **M. Pascual**, P. Pielke Jr., W. Pizer, C. Pringle, W.V. Reid, K.A. Rose, O. Sala, W.A. Schlesinger, D.H. Wall, D. Wear. 2001. Ecological forecasts: an emerging imperative. *Science* 293: 657-660.
- Bouma, M.J., and **M. Pascual**. 2001. Contributions of climate and geography to seasonal and interannual cycles of endemic cholera in Bengal 1891-1940. *Hydrobiologia* (Special Edition on 'Diseases in the Ocean') *Hydrobiologia* 460: 147-156.
- Pascual, M.**, P. Mazzega, and S. Levin. 2001. Oscillatory dynamics and spatial scale in ecological systems: the role of noise and unresolved pattern. *Ecology* 82(8): 2357-2369.
- Pascual, M.** and S.P. Ellner. 2000. Linking ecological patterns to environmental forcing via non-linear time series models. *Ecology* 81(10): 2767-2780.
- Pascual, M.**, X. Rodó, S.P. Ellner, R. Colwell and M.J. Bouma. 2000. Cholera dynamics and the El Niño Southern Oscillation. *Science* 289(5485): 1766.
- Pascual, M.** and S.A. Levin. 1999. From individuals to population densities: searching for the intermediate scale of nontrivial determinism. *Ecology* 80(7): 2225-2236.
- Pascual, M.** and S.A. Levin. 1999. Spatial scaling in a benthic population model with density-dependent disturbance. *Theoretical Population Biology* 56: 106-122.
- Pascual, M.** and H. Caswell. 1997. From the cell cycle to population cycles in phytoplankton-nutrient interactions. *Ecology* 78(3): 897-912.
- Pascual, M.** and H. Caswell. 1997. Environmental heterogeneity and biological pattern in a chaotic predator-prey system. *Journal of Theoretical Biology* 185: 1-13.

- Little, S.A., S. Ellner, **M. Pascual**, M. Neubert, D.T. Kaplan, T. Sauer, A. Solow, and H. Caswell. 1996. Detecting nonlinear dynamics in spatio-temporal systems: examples from ecological models. *Physica D* 96: 321-333..
- Pascual, M.**, F.A. Ascioti, and H. Caswell. 1995. Intermittency in the plankton: a multifractal analysis of zooplankton biomass variability. *Journal of Plankton Research* 17: 1209-1232.
- Pascual, M.** 1994. Periodic response to periodic forcing of the Droop equations for phytoplankton growth. *Journal of Mathematical Biology* 37: 743-759.
- Pascual, M.** 1993. Diffusion-induced chaos in a spatial predator-prey system. *Proceedings of the Royal Society of London B* 25: 1-7.
- Pascual, M.** and H. Caswell. 1991. The dynamics of a size-classified benthic population with reproductive subsidy. *Theoretical Population Biology* 39: 129-147.

Chapters

- Pascual, M.** and J. Dunne. 2005. From small to large networks in a dynamic world. *In* M. Pascual and J. Dunne (eds.). *Ecological networks: linking structure to dynamics in food webs*. SFI and Oxford University Press.
- Pascual, M.**, J. Dunne, and S.A. Levin. 2005. Challenges for the future *In* M. Pascual and J. Dunne (eds.). *Ecological networks: linking structure to dynamics in food webs*. SFI and Oxford University Press.
- Ruiz-Moreno D., **M. Pascual**, and R. Riolo. 2005. Exploring network space with genetic algorithms: modularity, resilience, and reactivity. *In* M. Pascual and J. Dunne (eds.). *Ecological networks: linking structure to dynamics in food webs*. SFI and Oxford University Press.
- Peacor S., R.L. Riolo, and **M. Pascual**. 2005. Phenotypic plasticity and species coexistence: modeling food webs as complex adaptive systems. *In* M. Pascual and J. Dunne (eds.). *Ecological networks: linking structure to dynamics in food webs*. SFI and Oxford University Press.
- Dobson A., S. Kutz, **M. Pascual**, and R. Winfree. 2003. Pathogens and parasites in a changing climate. *In* L. Hannah and T. Lovejoy (eds.), *Climate Change and Biodiversity: Synergistic Impacts*. *Advances in Applied Biodiversity Science* 4. Conservation International, Washington DC.
- Pascual, M.** 2001. Scales that matter: untangling complexity in ecological systems. *In* *Carving Our Destiny: Scientific Research Faces a New Millennium*. Commemorative volume, James S. McDonnell Centennial Fellowships, NAS and Joseph Henry Press.
- Deutschman, D., G.A. Bradshaw, W.M. Childress, K. Daly, D. Grunbaum, **M. Pascual**, and J. Wu. 1993. Mechanisms of patch formation, pp. 184-209. *In* Levin, S.A., T. Powell, and J.H. Steele (eds.), *Patch Dynamics*, *Lecture Notes in Biomathematics*, Springer-Verlag, New York.

Teaching

Lecturer (and co-organizer) at the Workshop on Infectious Diseases sponsored by the Theoretical Ecology course of the International Center for Theoretical Physics (ICTP, Trieste), Arusha, Tanzania (January 2012).

Lecturer (and co-organizer) at the Theoretical Ecology course of the International Center for Theoretical Physics, Trieste, Italy (March 2009).

Lecturer at the Summer School of the Santa Fe Institute in Bariloche, Argentina (December 2008).

Population and Community Ecology, Department of Ecology and Evolutionary Biology, University of Michigan (Fall 2006).

Population Dynamics, Department of Ecology and Evolutionary Biology, University of Michigan (2001-2005).

The Ecology and Evolution of Diseases, Department of Ecology and Evolutionary Biology and Program in the Environment, University of Michigan (2003-2007).

Graduate Teaching Assistant, Mathematics Learning Center, New Mexico State University (1988-1989).

Graduate Teaching Assistant (Field Ecology, Introductory Biology Laboratory), Department of Biology, New Mexico State University (1987-88).

Course Assistant, Marine Ecology Course, Marine Biological Laboratory, Woods Hole, MA (Summer 1986).

Membership in Professional Societies

The Ecological Society of America

The American Association for the Advancement of Science

Society for Industrial and Applied Mathematics

Invited Seminars

2011

Denver University, Denver, CO.

Universidad de los Andes (Latin American Congress of Parasitology), Bogota, Colombia.

University of California Santa Barbara, EEID (Ecology and Evolution of Infectious Diseases) Meeting, Santa Barbara, CA.

ASLO (American Society of Limnology and Oceanography), Ecology of Marine Infectious Diseases (EMID) Workshop, San Juan, Puerto Rico.

2010

University of Miami, The Rosenstiel School of Marine and Atmospheric Science (2010-2011 Distinguished Lecturer), Miami, FL.

Cornell University, EEID (Ecology and Evolution of Infectious Diseases) Meeting, Ithaca, NY.

ASM (American Society for Microbiology) Annual Meeting, Division R (Evolutionary and Genomic Microbiology) Lecturer, San Diego, CA.

Harvard University, Boston MA.

2009

Duke University, NC.

University of Amsterdam, Amsterdam, The Netherlands.

Centennial Fellows 10 Year Reunion Conference, J.S. McDonnell Foundation, St. Louis, MO.

2008

EcoHealth, Biennial meeting, Merida, Mexico (plenary).

National Institute of Malaria Research, Delhi, India.

University of California, Santa Barbara, CA.

Oxford University, Oxford, UK.

Princeton University, Princeton, NJ.

2007

University of Chicago, Chicago, IL.

Princeton University, Princeton, NJ.

Brown University, Providence, RI.

The Santa Fe Institute, Santa Fe, NM.

Graham Environmental Sustainability Institute, University of Michigan, Ann Arbor, MI.

Harvard University, Cambridge, MA.

Yale University, New Haven, CT.

2006

Science Museum, Barcelona, Spain.

Ecole Normale Supérieure, Paris, France.

2005

Columbia University, New York, NY.

Kellogg Biological Station, Michigan State University, MI.

Massachusetts Institute of Technology, Department of Civil and Environmental Engineering, Boston, MA.

Scripps Institution of Oceanography, Conference on The Future of Biodiversity (plenary speaker), San Diego, CA.

University of California San Diego, Section of Ecology, Behavior and Evolution, San Diego, CA.

2004

National Institute of Health, 5th Annual NIH Hispanic Scientist Day, Bethesda, MD.

Santa Fe Institute, 2004 Public Lecture Series, Santa Fe, NM.

Princeton Environmental Institute, Princeton, NJ.

2003

University of Chicago, Department of Ecology and Evolution, Chicago, IL.

Cornell University, Center for Applied Mathematics, Ithaca, NY.

Pennsylvania State University, Biology Department, University Park, PA.

2002

UCLA, Department of Biomathematics, Los Angeles, CA.

Gordon Conference in Mathematical Biology, NH.

21st Century Initiative Meeting, McDonnell Foundation, Tarrytown, NY.

2001

Isaac Newton Institute, Cambridge, England.

2000

Scripps Institution of Oceanography, University of California, San Diego, CA.

Massachusetts Institute of Technology, Department of Civil and Environmental Engineering, Boston, MA.

Florida State University, Department of Biological Sciences, Tallahassee, FL.

Emory University, Department of Environmental Studies, Atlanta, GA.

University of Michigan, Department of Biology, Ann Arbor, MI.

University of Washington, Department of Zoology, Seattle, WA.

University of Oxford, Department of Zoology, Oxford, England.

Yale University, Department of Ecology and Evolutionary Biology, New Haven, CT.

University of North Carolina, Department of Marine Sciences, Chapel Hill, NC.

Boston University, Department of Biology, Boston, MA.

1999

Institute of Global Environment and Society, Center for Ocean-Land-Atmosphere Studies, Calverton, MD.

Massachusetts Institute of Technology, Department of Earth, Atmospheric, and Planetary Sciences, Boston, MA.

University of Utah, Department of Biology and Dept. of Mathematics, Salt Lake City, UT.

National Academy of Sciences, James S. McDonnell Foundation Centennial Fellowship Symposium, Washington D.C.

Laboratoire d'Etudes en Géophysique et en Océanographie Spatiales, Toulouse, France.

University of Minnesota, Institute for Mathematics and its Applications, Minneapolis, MN.

University of California, Department of Ocean Sciences, Santa Cruz, CA.

University of Florida, Department of Zoology, Gainesville, FL.

1998-1997

Center for Coastal Physical Oceanography, Norfolk, VA.

Johns Hopkins University, Center for Environmental Fluid Dynamics, Baltimore, MD.

University of Maryland, Department of Biology, College Park, MD.

Woods Hole Oceanographic Institution, Sloan Foundation lecture series on Limits to Knowledge in Oceanography, Woods Hole, MA.

1996-1995

University of Maryland Biotechnology Institute, Center of Marine Biotechnology, Baltimore, MD.

University of Rhode Island, Graduate School of Oceanography, Narragansett, RI.

Princeton University, Department of Ecology and Evolutionary Biology, Princeton, NJ.

1994-1993

Oregon State University, Zoology Department, Corvallis, OR.

Summer Institute for Geophysical Fluid Dynamics, Bio-Physical Models of Oceanic Population Dynamics, Woods Hole, MA.

Yale University, Seminar Series on Nonlinear Dynamics and Computational Ecology, New Haven, CT.

Research Presentations

- Zinder, D., T. Bedford, S. Gupta and **M. Pascual**. 2011. Epidemics3 Third International Conference on Infectious Disease Dynamics, Boston, MA.
- Bedford, T., A. Rambaut and **M. Pascual**. 2011. Epidemics3 Third International Conference on Infectious Disease Dynamics, Boston, MA.
- Baeza, A., A. ter Veen, M. Bouma and **M. Pascual**. 2011. Ecological Society of America (ESA), Annual Meeting, Austin, TX.
- Reiner, R., A. King, and **M. Pascual**. 2011. Ecological Society of America (ESA), Annual Meeting, Austin, TX.
- Artzy, Y., and **M. Pascual**. 2011. Ecological Society of America (ESA), Annual Meeting, Austin, TX.
- Pascual, M.**, D. Alonso, M. Bouma, Y. Artzy and A. Dobson. 2010. Ecological Society of America (ESA), Annual Meeting, Pittsburg, PN.
- Y. Artzy and **M. Pascual**. 2010. Ecological Society of America (ESA), Annual Meeting, Pittsburg, PN.
- E. Baskerville, A. Dobson, T. Bedford, S. Allesina and M. Pascual. 2010. Ecological Society of America (ESA), Annual Meeting, Pittsburg, PN.
- Pascual, M.**, D. Alonso and Y. Artzy. 2009. American Association for the Advancement of Science (AAAS). Annual Meeting, Chicago, IL.
- Pascual, M.**. 2009. Howard Hughes Medical Institute, Washington DC.
- Pascual, M.**. 2008. Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers, NJ.
- Pascual, M.** and D. Alonso. 2007. Ecological Society of America (ESA). 92st Annual Meeting. San Jose, CA.
- L.F. Chaves, J.M. Cohen, **M. Pascual**, and M. Wilson. 2007. Ecological Society of America (ESA). 92st Annual Meeting. San Jose, CA.
- S. Allesina, D. Alonso, and **M. Pascual**. 2007. Ecological Society of America (ESA). 92st Annual Meeting. San Jose, CA.
- D. Ruiz-Moreno, Md. Yunus, M. Emch, and **M. Pascual**. 2007. Ecological Society of America (ESA). 92st Annual Meeting. San Jose, CA.
- Pascual, M.** and A. King. 2007. AAAS Annual Meeting, San Francisco CA.
- Pascual, M.**. 2006. EcoHealth One. Madison, WI.
- L.F. Chaves and **M. Pascual**. 2006. EcoHealth One. Madison, WI.
- S. Cobey and **M. Pascual**. 2006. EcoHealth One. Madison, WI.
- Pascual, M.**, B. Cazelles, L.F. Chaves, and K. Koelle. 2006. Ecological Society of America (ESA). 91st Annual Meeting. Memphis. TN
- Allesina, S. and **M. Pascual**. 2006. ESA. 91st Annual Meeting. Memphis. TN

- Koelle, K., S. Cobey, B. Grenfell and **M. Pascual**. 2006. ESA. 91st Annual Meeting. Memphis. TN
- Pascual, M.**. 2006. AAAS Annual Meeting. St. Louis.
- Pascual, M.**. 2005. AAAS Annual Meeting. Washington DC.
- K. Koelle, **M. Pascual**, and Md. Yunus. 2005. Ecological Society of America (ESA) 90th Annual Meeting. Montreal, CA.
- D. Alonso, A. McKane, and M. Pascual. 2005. Ecological Society of America (ESA) 90th Annual Meeting. Montreal, CA.
- Pascual, M.** 2004. Computational and Mathematical Population Dynamics. Joint Conference MPD7 - Destobio 3. Trento, Italy. *Invited plenary speaker*.
- Pascual, M.** and J. Aparicio. 2004. Ecological Society of America (ESA) 89th Annual Meeting. Portland, OR.
- K. Koelle and **M. Pascual**. 2004. Ecological Society of America (ESA), 89th Annual Meeting. Portland, OR.
- Pascual, M.**, J. Aparicio, and K. Koelle. 2004. Annual Conference on Infectious Diseases, Emory, Atlanta, GA. *Invited*.
- Pascual, M.**, M. Roy, and F. Guichard. 2003. Second International Conference on Mathematical Ecology. Alcalá de Henares. Spain.
- Pascual, M.** and K. Koelle. 2003. Ecological Society of America (ESA) 88th Annual Meeting. Introduction to symposium of the Theoretical Ecology Section. Savannah, GA.
- Roy, M. and **M. Pascual**. 2003. ESA 88th Annual Meeting. Savannah, GA.
- Koelle, K., and **M. Pascual**. 2003. ESA 88th Annual Meeting. Savannah, GA.
- Pascual, M.**, X. Rodó, and K. Koelle. 2003. American Association for the Advancement of Science, Annual Meeting. Symposium on the Ecology of Infectious Diseases. Denver, CO.
- Pascual, M.**, M. Roy, and S. Levin. 2002. Biodiversity Symposium. Biodiversity of Planktonic Communities: Scaling Up and Down. Ann Arbor, MI. *Invited*
- Pascual, M.** and A. Dobson. 2002. Millenium Assesment Meeting. Trinidad. *Invited*.
- Pascual, M.** and M. Roy. 2001. SFI/UM, Center for the Study of Complex Systems, Annual Meeting at UM. Ann Arbor, MI. *Co-organizer*.
- Pascual, M.**, M. Roy, A. Dobson, X. Rodó, and M. Bouma. 2001. ESA 86th Annual Meeting. Symposium. Madison. WI.
- M. Roy, **Pascual, M.**, and G. Flierl. 2001. ESA 86th Annual Meeting. Madison. WI.
- Pascual, M.**. 2001. XX Reunion Argentina de Ecologia. (Integrando escalas-Confrontando enfoques). Bariloche, Argentina.
- Pascual, M.**. 2000. Symposium on Transport and Mixing in Geophysical Flows. European Geophysical Society, Nice. *Invited*
- Rodó, X. and **M. Pascual**. 1999. American Society for Limnology and Oceanography (ASLO), Annual Meeting. Santa Fe, NM.
- Armstrong, R.A., **M. Pascual**, K.K. Cavender-Bares, and S.W. Chisholm. 1999. ASLO Annual Meeting, Santa Fe, NM.
- Ellner, S.P. and **M. Pascual**. 1999. AAAS Annual Meeting, Anaheim, CA.
- Pascual M.**, S.P. Ellner and G. Bobashev. 1998. VII International Congress of Ecology. Florence.

Italy.

- Pascual, M.**, G. Bobashev, and S. Ellner. 1998. First International Conference on Mathematical Ecology. Alcalá de Henares. Spain.
- Pascual, M.**, G. Flierl, and H. Caswell. 1998. AAAS Annual Meeting, Philadelphia, PA.
- Pascual, M.** and S.A. Levin. 1997. ESA 82nd Annual Meeting, Albuquerque, NM.
- Pascual, M.** and S.A. Levin. 1996. ESA 81st Annual Meeting. Providence, RI (poster).
- Little, S. and **M. Pascual**. 1996. ESA 81st Annual Meeting. Providence, RI.
- Little, S., **M. Pascual**, S. Ellner, and M. Neubert. 1995. International Workshop on Measures of Spatio-Temporal Dynamics, Bryn Mawr, PA.
- Pascual, M.** 1992. ASLO Aquatic Sciences Meeting, Santa Fe, NM (poster).
- Pascual, M.** 1990. Biology Department, WHOI, Woods Hole, MA.
- Pascual, M.** 1988. First Autumn Workshop on Mathematical Ecology, ICTP, Trieste, Italy.
- Pascual, M.** 1988. Research Symposium, Department of Biology, NMSU, Las Cruces, NM.
- Pascual, M.** 1986. Second Autumn Course on Mathematical Ecology, International Center for Theoretical Physics, Trieste, Italy.
- Pascual, M.**, and H. Caswell. 1986. General Scientific Meetings, Marine Biological Laboratory, Woods Hole, MA.

Professional Service

- Science Steering Committee, SantaFe Institute (SFI), NM. (2012)
- Chair, Cluster Faculty Search on 'Networks and Diversity' (UM 2011).
- Chair, Faculty Search committee for joint position between EEB and CSCS (2009).
- Advisory Panel, OHHI (Oceans and Human Health Initiative), NOAA. (2006-present).
- Advisory Board, Complex Systems, James S. McDonnell Foundation. (2005-present).
- Co-organizer of NSF Workshop on Theoretical Biology. (2006).
- Panel Member, NSF Ecology of Infectious Diseases (2006).
- Chair, Faculty Search committee for Ecology position (2004).
- Chair of the Theoretical Section of the Ecological Society of America (2003-04).
- Vice Chair of the Theoretical Section of the Ecological Society of America (2002-03)
- Member of the Visions Committee of the Ecological Society of America (2003-04).
- Co-chair of special sessions/symposia at scientific meetings: 'Climate and Disease: Quantitative Insights and Interdisciplinary Challenges' (AAAS2007); 'The assembly and disassembly of ecological networks' (ESA 2007) ; 'The rising tide of ocean plagues' (AAAS2006); 'Death of determinism? Noise in a nonlinear world' (ESA 2003); 'New developments in marine and freshwater epidemiology' (ASLO 1999); 'Long term time series in ecology: novel approaches for a new synthesis' (INTECOL 1998).
- Scientific Committee, Second International Conference on Mathematical Ecology, Alcala de Henares, Spain (2003).
- Executive committee member: Department of Ecology and Evolutionary Biology, University of Michigan (fall 2001-2003).

Executive committee member: Center for the Study of Complex Systems, University of Michigan (spring 2001-present).

Editorial board: PLoS Computational Biology, Theoretical Ecology, and Ecohealth (current). Subject-matter editor, Ecological Letters (January 2001-2004).

Member of the National Academy of Sciences/National Research Council Committee on Strengthening the Linkages between the Sciences and the Mathematical Sciences (1998).

Journal Article Reviews (within last five years): PloS Medicine; PloS Neglected Tropical Diseases; Proceedings of the Royal Society B; Proceedings of the Royal Society Interface; BioMedCentral Ecology; American Naturalist; Frontiers in Ecology and the Environment; Ecology; Marine Ecology Progress Series; Theoretical Population Biology; Geophysical Research Letters; Journal of Mathematical Biology; Proceedings of the National Academy of Sciences; Nature; Mathematical Biosciences.

Book Reviews: Bulletin of Mathematical Biology; Princeton University Press; Oxford University Press.

Proposal Reviews (within the last five years): NSF Biological Oceanography; NSF Ecology; NSF Ecology of Infectious Diseases; NSF Research at Undergraduate Institutions; NOAA.

Workshops

Workshop on Infectious Diseases (co-organizer). Sponsored by the International Center for Theoretical Physics (ICTP, Trieste, Italy). Arusha, Tanzania. 2012.

Theory and models for infectious disease dynamics: from the land to the sea. Ecology of Marine Infectious Diseases (EMID) Workshop. San Juan, Puerto Rico. 2011.

Theoretical Ecology course/workshop (co-organizer). International Center for Theoretical Physics (ICTP), Trieste, Italy. 2009.

Climate and Disease (co-organizer). Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers, NJ. 2008.

Parasites and Food Webs (co-director of working group). National Center for Ecological Analysis and Synthesis. Santa Barbara, CA. 2007-present.

Models of Emergent Behavior in Complex Adaptive Systems. Santa Fe Institute (SFI) and ICAM. Santa Fe, NM. 2007.

Linking Structure and Dynamics in Complex Ecological Networks (co-director). Santa Fe Institute. Santa Fe, NM. 2004.

Seasonality and the Population Dynamics of Infectious Diseases (co-director of working group). National Center for Ecological Analysis and Synthesis. Santa Barbara, CA. 2003-2004.

Global Change and Infectious Disease. National Center for Ecological Analysis and Synthesis (working group). Santa Barbara, CA. January 2004.

The Spatial Dynamics of Diseases. National Center for Ecological Analysis and Synthesis (working group). Santa Barbara, CA. 2000-2001.

Ecological Forecasting. National Center for Ecological Analysis and Synthesis (working group). Santa Barbara, CA. 2001.

Macroscopic Organisation from Microscopic Behavior in Immunology, Ecology, and Epidemiology.

Newton Institute, Cambridge, England. 2001.

Robustness in Ecological and Biological Systems (co-organizer) Center for the Study of Complex Systems, UM, Ann Arbor, MI. 2001.

Ocean Carbon Transport, Exchanges and Transformations (OCTET). Washington DC. 2000.

Health, Climate, and Infectious Disease: a Global Perspective. American Academy of Microbiology, Tucson, AZ. 1999.

Mixing and Reactive Turbulence. National Center for Atmospheric Research, Boulder, CO. 1999.

Climate and Health Diagnostic Workshop. NOAA, North Falmouth, MA. 1999.

From Individual to Aggregation: Modelling Animal Grouping. Institute for Mathematics and its Applications, Minneapolis, MN. 1999.

The Ecology and Evolution of Biodiversity. Princeton University, Princeton, NJ. 1997.

Climate Variability and Human Health: An Interdisciplinary Perspective. American Academy of Microbiology, Montego Bay, Jamaica. 1997.

Exploring Nonlinearities in Simple Plankton Models. ONR University Research Initiative Program. University of California, Berkeley. 1996.

Ecomachines and Spatial Modeling in Ecology and Biology. Santa Fe Institute. Santa Fe, NM. 1996.

Nonlinear Data Analysis in Marine Ecology. ONR University Research Initiative Program. Woods Hole, MA. 1994.

Biological/Physical Modelling of Upper Ocean Processes. ONR University Research Initiative Program. Woods Hole, MA. 1993.

Funding

NSF/NIH Program on Ecology of Infectious Diseases. Var Gene Diversity and *Plasmodium falciparum* Transmission Dynamics. (With co-PIs Karen Day, New York University, and Andrew Dobson, Princeton University), (*submitted* December 2011).

Howard Hughes Medical Institute (September 2008-August 2012)

National Science Foundation, Advancing Theory in Biology. The spider and the web: inference in ecological networks. (With Stefano Allesina, National Center for Ecological Analysis and Synthesis). (September 2008- August 2011)

National Oceanic and Atmospheric Administration, Oceans and Human Health Program. Cholera prediction: the role of the oceans and nonlinear disease dynamics. (With the Center for Land-Atmosphere-Ocean Studies, Princeton University and the University of North Carolina). (August 2008-)

ESMRT awards, Graham Environmental Sustainability Institute, University of Michigan. Vector-transmitted diseases in a changing world. (With I. Perfecto, School of Natural Resources and the Environment, and Edward Ionides, Statistics, at UM), (January 2007-December 2008).

NSF/NIH Program on Ecology of Infectious Diseases. The interplay of environmental forcing and intrinsic disease dynamics: cholera as a case study. Collaborative proposal with the Center for Land-Atmosphere-Ocean Studies (COLA), Princeton University, and University of Tennessee (September 2004-August 2008).

NOAA, Oceans and Human Health Initiative. Cholera across scales: oceanic links to climate and

local estuarine influences. Subcontracts to COLA, Princeton University, and Portland State University. (October 2004-September 2007).

NOAA-EPRI-NSF-EPA-NASA. Joint Program on Climate Variability and Human Health. Cholera dynamics and climate variability: towards prediction of disease incidence (2001- February 2005).

James S. McDonnell Foundation. Centennial Fellowship in the area of Global and Complex Systems. Scales that matter: untangling complexity in ecological systems (1999-2008).

NSF Biocomplexity: Phase I. Collaborative research (with D. Capone, E. Carpenter, PIs). Factors affecting, and impact of, diazotrophic microorganisms in the Western Equatorial Atlantic Ocean. (1999-2004).

Wallenberg Foundation. Participant in the VIRTUE Program (Virtual University Education Program) of the University of Maryland (1997-2001).

NOAA/NIH. A historical analysis of cholera dynamics in Bengal 1870-1940 in relation to ENSO and rainfall. (M.J. Bouma, co-PI, 1998-99; pilot project).

Student and Postdoctoral Mentoring

Mary (Molly) Rorick (postdoc, fall 2011-present); **Robert Reiner** (postdoc, spring 2010-summer 2011); **Richard Zinck** (postdoc, winter 2010-spring 2011); **Trevor Bedford** (postdoc, HHMI, fall 2008-summer 2011); **Andres Baeza** (graduate student, fall 2008-present); **Ed Baskerville** (graduate student, fall 2008-present); **Karina Laneri** (postdoc, winter 2008-present); **Yael Artzy** (postdoc, winter 2008-present); **Sarah Cobey** (graduate student, fall 2004-2009; at present: postdoc, Harvard University); **Diego Ruiz-Moreno** (graduate student, fall 2004-2009; at present: postdoc, Cornell University); **Luis Fernando Chaves** (graduate student, fall 2004-winter2008; postdoc, Emory); **Katia Koelle** (graduate student, fall 2002-fall 2005; at present: assistant professor position at Duke, EEB), **David Alonso** (postdoc, winter 2003-summer 2007; at present: Research fellow, University of Groningen, The Netherlands); **Stefano Allesina** (postdoc, 2005-summer 2007; at present: Assistant Professor, University of Chicago); **Christopher Warren** (postdoc, Fall 2003-December 2004; at present: research fellow at Mayo); **Khalid Boushaba** (postdoc, September 2001 - August 2003; at present: Assistant Professor, Dept. of Mathematics, Iowa State University); **Manojit Roy** (postdoc, 2000-December 2003; at present: Research Scientist, UM).

Ed Baskerville (undergraduate, computer science, Summer-Fall 2003).

Outreach / Radio and Press Coverage

2010: Flu doesn't die out, it hides out: U.S. News & World Report; U.S. Department of Health and Human Services; Science Daily; Reuters; Post Chronicle; MSNBC; India Times; Health Care Weekly Review; Centre For Infectious Disease Research and Policy. **2009:** The New York Times Magazine (The 9th Annual Year in Ideas); BBC; Discovery News; Australian Broadcasting Corporation (ABC News); ABC Radio National, The Health Report; Inter Press Service (IPS); La Jornada (Mexico City); SciDvNet; Scientific American; **2007:** La Nación (Argentinian newspaper); cholera research featured in exhibit on Climate Change at The Museum of Zoology (UM); Spanish TV; **2006:** Time Magazine (Special issue on global climate change); BBC News; BBC Spanish;

United Press International, Daily India, Madrid Newspaper ABC, Folha de Sao Paulo, La Vanguardia (Barcelona). **2005:** BBC Word Series; Radio 10 (Argentina); LA Times. **2003:** Detroit Free Press; Discover Magazine; Earthwatch Radio. **2002:** The Todd Mundt Show (NPR, MI); Ann Arbor News; Folha de Sao Paulo. **2000:** Baltimore Sun.