September 2013

Woods Hole Oceanographic Institution, Department of Physical Oceanography, Woods Hole, Massachusetts 02543, Tel: (508) 289-2753, Fax: (508) 457-2181, lstlaurent@whoi.edu

LOUIS ST. LAURENT

EDUCATION

1994 B.S., University of Rhode Island, Kingston, Rhode Island. Major: Physics. Graduated with highest distinction.

1999 Ph.D., Massachusetts Institute of Technology and Woods Hole Oceanographic Institution – Joint Program in Oceanography, Physical Oceanography.

POSITIONS HELD

1994-1999 Research Assistant, Woods Hole Oceanographic Institution.

2000-2002 Postdoctoral Fellow, School of Earth and Ocean Science, University of Victoria, British Columbia, Canada.

2002-2008 Assistant Professor, Department of Oceanography, Florida State University.

2002-2003 Intergovernmental Personal Act Program Officer, Office of Naval Research.

2008 Tenure awarded, Department of Oceanography, Florida State University.

2008-2009 Associate Professor – Department of Oceanography, Florida State University.

2009- Associate Scientist with tenure – Department of Physical Oceanography, Woods Hole Oceanographic Institution.

2012- Adjunct Professor – School of Marine Science and Technology, University of Massachusetts – Dartmouth.

RESEARCH INTERESTS

Turbulent processes, such as diffusion and mixing. Internal waves and internal tides, wave-wave interactions. Boundary-layer processes, such as friction and topographic drag. Buoyancy forcing, heating and cooling by the atmosphere. Convection, double diffusion, and hydrostatic instability, Ocean sensing technologies, Autonomous Underwater Vehicles.

AWARDS

Sigma Pi Sigma National Physics Honor Society, University of Rhode Island 1993. Phi Beta Kappa National Honor Society, University of Rhode Island 1993. Geophysical and Environmental Fluid Dynamics Lecture Series Fellowship, Cambridge University, UK 1998. Ruth and Paul Fye Award for Excellence in Oceanographic Research, Woods Hole Oceanographic Institution 2001. Developing Scholar Award, Florida State University 2009. Fofonoff Award, American Meteorological Society 2012.

REFERREED PUBLICATIONS (†denotes student or postdoc lead author)

St. Laurent, L., and R. W. Schmitt (1999). The contribution of salt fingers to vertical mixing in the North Atlantic Tracer Release Experiment. Journal of Physical Oceanography, 29, 1404-1424.

Ledwell, J. R., E. T. Montgomery, K. L. Polzin, L. St. Laurent, R. W. Schmitt, and J. M. Toole (2000). Evidence for enhanced mixing over rough topography in the abyssal ocean. Nature, 403, 179-182.

Jayne, S. R., and L. St. Laurent (2001). Parameterizing tidal dissipation over rough topography. Geophysical Research Letters, 28, 811-814.

St. Laurent, L., J.M. Toole, and R.W. Schmitt (2001). Buoyancy forcing by turbulence above rough topography in the abyssal Brazil Basin. Journal of Physical Oceanography, 31, 3476-3495.

Morris, M., M. Hall, L. St. Laurent, and N. Hogg (2001). Abyssal mixing in the deep Brazil Basin. Journal of Physical Oceanography, 31, 3331-3348.

Garrett, C., and L. St. Laurent (2002). Aspects of deep ocean mixing. Journal of the Oceanographic Society of Japan, 58, 11-24.

St. Laurent, L., and C. Garrett (2002). The role of internal tides in mixing the deep ocean. Journal of Physical Oceanography, 32, 2882-2899.

St. Laurent, L., H. L. Simmons, S. R. Jayne (2002). Estimating tidally driven mixing in the deep ocean. Geophysical Research Letters, 29, 2106-2110, doi:10.1029/2002GL015633.

St. Laurent, L., S. Stringer, C. Garrett, and D. Perrault-Joncas (2003). The generation of internal tides at abrupt topography. Deep-Sea Research I, 50, 987-1003, doi:10.1016/S0967-0637(03)00096-7.

Jayne, S. R., L. C. St. Laurent, and S. T. Gille (2004). Connections between ocean bottom topography and Earth's climate. Oceanography, 17, 65-74.

Simmons, H. L., S. R. Jayne, L. St. Laurent, and A. Weaver (2004). Tidally driven mixing in a numerical model of the ocean general circulation. Ocean Modeling, 6, 245-263, doi:10.1016/S1463-5003(03)00011-8.

van Haren, H., L. St. Laurent, and D. Marshall (2004). Small and mesoscale processes and their impact on the large scale: an introduction. Deep-Sea Research II, 51, 2883-2888, doi:10.1016/j.dsr2.2004.09.010.

St. Laurent, L. and J. Nash (2004). An examination of the radiative and dissipative properties of the internal tides. Deep-Sea Research II, 51, 3029-3042, doi:10.1016/j.dsr2.2004.09.008.

Thurnherr, A. M., L. St. Laurent, K. G. Speer, J. M. Toole, and J. R. Ledwell (2005). Mixing associated with sills in a canyon on the Mid-Ocean Ridge Flank. Journal of Physical Oceanography, 35, 1370-1381.

Dewar, W. K., R.J. Bingham, R. L. Iverson, D. P. Nowacek, L. C. St. Laurent, and P. H. Wiebe (2006). Does the marine biosphere mix the ocean? Journal of Marine Research, 64, 541-561.

St. Laurent, L., and H. Simmons (2006). Estimates of power consumed by mixing in the ocean interior. Journal of Climate, 19, 4877-4890.

St. Laurent, L., and A. Thurnherr (2007). Intense mixing of lower thermocline water on the crest of the Mid-Atlantic Ridge. Nature, 448, 680-683, doi:10.1038/nature06043.

Thurnherr, A., G. Reverdin, P. Bourouet-Aubertot, L. St. Laurent, A. Vangriesheim, and V. Ballu (2008). Hydrography and flow in the Lucky Strike segment of the Mid-Atlantic Ridge. Journal of Marine Research, 66, 347-372.

†Inoue, R., E. Kunze, L. St. Laurent, R. W. Schmitt and J. M. Toole (2008). Evaluating Linear Salt-Fingering Theories. Journal of Marine Research, 66, 413-440.

St. Laurent, L. (2008). Turbulent dissipation on the margins of the South China Sea. Geophysical Research Letters. 35, doi:10.1029/2008GL035520.

Ledwell, J. R., L. C. St. Laurent, J. B. Girton, and J. M. Toole. (2011) Diapycnal mixing in the Antarctic Circumpolar Current. Journal of Physical Oceanography, 41, 241-246.

†Hazen E. L., D. P. Nowacek, L. St. Laurent, P. N. Halpin, D. J. Moretti. (2011) The relationship among oceanography, prey fields, and beaked whale foraging habitat in the Tongue of the Ocean. PLoS ONE 6(4): e19269. doi:10.1371/journal.polne.0019269.

Thurnherr, A. M., and L. C. St. Laurent (2011) Turbulence and diapycnal mixing over the East Pacific Rise crest near 10°N, Geophysical Research Letters, 38, L15613, doi:10.1029/2011GL048207.

St. Laurent, L., H. Simmons, T. Y. Tang, and Y. Wang (2011) Turbulent properties of internal waves in the South China Sea. Oceanography, 24, 78-87.

†Fu, K., Y. Wang, L. St. Laurent, H. Simmons, and D. Wang (2012) Shoaling of large-amplitude nonlinear internal waves over a steep slope in the Dongsha Atoll in the northern South China Sea. Journal of Continental Shelf Research, 37, 1-7, doi:10.1016/j.csr.2012.01.010.

Thurnherr, A., and L. St. Laurent (2012) Turbulence observations in a buoyant hydrothermal plume on the East Pacific Rise. Oceanography. 25, 180-181.

St. Laurent, L., M. Alford, and T. Paluszkiewicz (2012) An Introduction to the Special Issue on Internal Waves. Oceanography, 25, 15-19.

St. Laurent, L. C., A. Naveira Garabato, J. R. Ledwell, A. M. Thurnherr, and J. M. Toole (2012) Turbulence and diapycnal mixing in Drake Passage. Journal of Physical Oceanography. 42, 2143–2152.

Mackinnon, J., L. St. Laurent, and A. Naveira Garabato (2012) Dianeutral transport processes in the ocean interior. Chapter 3.3 in *Ocean Circulation and Climate, 2nd Edition,* G. Siedler, and J. Church, editors, International Geophysics Series, Academic Press, in press.

†Sheen, K. L., J. A. Brearley, A. C. Naveira Garabato, S. Waterman, D. A. Smeed, J. R. Ledwell, M. P. Meredith, L. St. Laurent, A. M. Thurnherr, J. M. Toole, and A. J. Watson (2013) Rates and mechanisms of turbulent dissipation and mixing in the Southern Ocean: Results from the DIMES experiment. Journal of Geophysical Research. 118, 2774–2792.

†Sun, O. M. T., S. R. Jayne, K. L. Polzin, B. A. Rahter, L. C. St. Laurent (2013) Parameterizing turbulent mixing in the transition layer. Journal of Physical Oceanography, accepted.

†Waterhouse, A. J. A. Mackinnon, J. D. Nash, M. H. Alford, E. Kunze, H. L. Simmons, K. L. Polzin, L. C. St. Laurent, O. Sun, R. Pinkel, L. D. Talley, C. B. Whalen, T. N. Huussen, G. S. Carter, I. Fer, S. Waterman, A. Naveira-Garabato, A. M. Thurnherr, T. Stanford, and C. Lee (2013) Global patterns of diapycnal mixing from measurements of the turbulent dissipation rate. Journal of Physical Oceanography. Submitted.

OTHER PUBLICATIONS

Gille, S.T., J. Ledwell, A. Naveira Garabato, K. Speer, D. Balwada, A. Brearley, J, Girton, A. Griesel, R. Ferrari, A. Klocker, J. LaCasce, P. Lazarevich, N. Mackay, M. Meredith, M. J. Messias, B. Owens, J. B. Sallee, K. Sheen, E. Shuckburgh, D. Smeed, L. St Laurent, J. Toole, A. Watson, N. Wienders, and U. Zajaczkovski,. 2012 The diapycnal and isopycnal mixing experiment: a first assessment. CLIVAR Exchanges 58, Vol. 17(1), 46-48.

Toole, J. M., J. R. Ledwell, K. L. Polzin, R. W. Schmitt, E. M. Montgomery, L. St. Laurent, and W. B. Owens. (1997). The Brazil Basin Tracer Release Experiment. International WOCE Newsletter, 28, 25-28.

St. Laurent, L. (1999). Diapycnal advection by double diffusion and turbulence in the ocean. Ph.D. dissertation, MIT-WHOI Joint Program in Oceanography, 139 pp.

St. Laurent, L., J. M. Toole, and R. W. Schmitt. (2001). Mixing and diapycnal advection in the ocean. *In* Proceedings of the 'Aha Huliko'a Hawaiian Winter Workshop, 175-185.

St. Laurent, L., and C. Garrett. (2002). Energy dissipation by internal ocean tides. Bulletin of the American Meteorological Society, 83, 1457-1458.

St. Laurent, L., and J. Nash. (2003). On the fraction of internal tide energy dissipated near topography. *In* Proceedings of the 'Aha Huliko'a Hawaiian Winter Workshop, 45-58.

Lueck, R., and L. St. Laurent (2008). Turbulence in the benthic boundary layer. *In* Encyclopedia of Ocean Sciences. Online Edition: Elsevier.

Wolk, F., R. G. Lueck, and L. St. Laurent (2009). Turbulence Measurements from a Glider. OCEANS 2009, MTS/IEEE Biloxi - Marine Technology for Our Future: Global and Local Challenges. 1-6.

TEACHING AND ADVISING ACTIVITIES

Advisor for WHOI Summer Student Fellow: Joe Lozier (Duke, 2011).

Advisor for WHOI Guest Student: Ke-Hsien Fu (National Sun Yat-Sen University, 2011).

Graduate advisor for: Sommai Tharawechrak (MS, FSU, 2007), Bryan Rahter (MS, FSU, 2009). Jay Hooper (MS, FSU, 2010), Steven Lambert (MS, FSU, 2011), Alec Bogdanoff (PhD candidate, WHOI, 2011-present), Sophia Merrifield (PhD Candidate, WHOI, 2012-present).

Courses taught: Analysis Methods, FSU, 2005, 2007, 2009; Applied Acoustics, FSU, 2006; Dynamical Oceanography, FSU, 2006, 2008; Elementary Oceanography, FSU, 2005, 2007, 2008; Fundamentals of Acoustics, FSU, 2004; Physical Oceanography of the Polar Region, FSU, 2002; Physical Oceanography Seminar, FSU, 2006.

OTHER PROFESSIONAL ACTIVITIES

Society Memberships: American Geophysical Union (1994), American Meteorological Society (1994).

Meeting organizer:
Co-organizer/chair, IAPSO/SCOR Conference on Ocean Mixing, Victoria, BC, Canada 11-14 October 2004.
Co-organizer/chair, numerous sessions American Geophysical Union Annual Meetings and Ocean Science Meetings, 2004-2010.

Reviewer: Journal of Geophysical Research, Geophysical Research Letters, Journal of Physical Oceanography, Journal of Marine Research, Journal of Fluid Mechanics, Deep-Sea Research, Ocean Modelling, Science, Nature.

Guest Editor:
van Haren, H., L. St. Laurent, and D. Marshall. Small and mesoscale processes and their impact on the large scale. Special Issue. Deep-Sea Research II, 51, 2004.
St. Laurent, L., M. Alford, and T. Paluszkiewicz. Special Issue on Internal Waves. Oceanography. 25, 2012.

Institution Committees: FSU Oceanography Admissions Committee, 2004-2008. FSU Oceanography Computer committee, 2005-2008. FSU Oceanography *Ad Hoc* Curriculum Committee, 2006-2008. FSU Geophysical Fluid Dynamics Admissions Committee, 2004-2008. WHOI PO recruitment committee, 2010-present. WHOI Deep Ocean Exploration Institute committee, 2011-present, WHOI Marine operations committee, 2011-present.

Working groups:
Co-Organizer, Physical Oceanography Dissertation Symposium (PODS) 2004.
Working Group Member, International Association for the Physical Sciences of the Oceans / Scientific Committee on Oceanic Research, 2004-2008.
Workshop contributor, Mentoring Women in Physical Oceanography (MPOWIR) 2005.
Working Group Member, NSF Climate Process Team on Parameterizations for Internal Wave Driven Mixing, 2010-present.
Member, CLIVAR Process Study Model Improvement Panel, 2013-present.

Steering Committees:
Nonlinear Internal Wave Initiative, ONR Department Research Initiative, 2005-2008.
Internal Waves in Straits Experiment, ONR Department Research Initiative, 2008-2012.
Vietnam East Sea, ONR Department Research Initiative, 2010-present.

FIELD EXPERIENCE (expeditions where I was on the vessel conducting science)

Brazil Basin Tracer Release Experiment, 1996, R/V Seward Johnson

Brazil Basin Tracer Release Experiment, 1997, R/V Seward Johnson

Littoral Internal Wave Initiative, 1998, R/V Oceanus

Strait of Juan de Fuca Survey, 2000, R/V Tully (Canada)

Knight Inlet Survey, 2001, R/V Vector (Canada)

South China Sea Survey, 2005, R/V Ocean Researcher I (Taiwan), ONR Co-PI

GRAVILUCK Study - Mid-Atlantic Ridge, 2006, R/V Atalante (France), NSF Co-PI

Gulf Stream Survey, 2007, R/V Walton Smith, ONR Co-PI

Dongsha Island Survey, 2007, R/V Ocean Researcher III (Taiwan), ONR Chief Scientist

LADDER III Study – East Pacific Rise, 2007, R/V Atlantis, NSF Co-PI

South China Sea, 2008, R/V Ocean Researcher I (Taiwan), ONR PI

Bahamas TOTO Survey, 2008, R/V Revelle, ONR Co-PI

Line-W Survey, 2009, R/V Endeavor. NSF collaborator

Southern Ocean DIMES Study, 2010, R/V Thompson, NSF Co-PI

Internal waves in Straits Experiment, 2011, R/V Revelle, ONR Chief Scientist

Southern Ocean DIMES Study, 2012, RRS James Cook, NSF Co-PI

Sub-mesoscale Cascade in the S. China Sea Study, 2013, R/V Revelle, ONR Chief Scientist

Drake Passage DIMES Study, 2013 (forth coming), R/V Palmer. NSF Chief Scientist

LECTURES (invited)

Diapycnal advection by double diffusion and turbulence in the ocean. Physical Oceanography Seminar, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts, July, 1999.

Turbulence and mixing in the abyssal Brazil Basin. School of Earth and Ocean Science Seminar, University of Victoria, Victoria, British Columbia, Canada, August, 1999.

Turbulence and mixing in the abyssal Brazil Basin. Physical Oceanography Seminar, University of Hawaii at Manoa, Honolulu, Hawaii, August, 1999.

Turbulence and mixing in the abyssal Brazil Basin. Department of Physical Oceanography Seminar, University of Washington, Seattle, Washington, May, 2000.

Double-diffusive convection in the ocean. School of Earth and Ocean Science Seminar, University of Victoria, Victoria, British Columbia, Canada, September, 2000.

Internal tides and mixing in the deep ocean. Department of Atmospheric and Oceanic Sciences Seminar, University of California-Los Angeles, Los Angeles, California, April, 2001.

Turbulence and mixing in the abyssal Brazil Basin. Physical Oceanography Seminar, Florida State University, Tallahassee, Florida, June, 2001.

Turbulence and mixing in the abyssal Brazil Basin. Physical Oceanography Seminar, University of Miami, Miami, Florida, October, 2001.

The role of internal tides in mixing the deep ocean. Physical Oceanography Seminar, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts, October, 2001.

Internal tides and mixing in the deep ocean. Physical Oceanography Department Seminar, Florida State University, Tallahassee, Florida, October, 2002.

Internal tides and mixing in the deep ocean. International Arctic Research Center Seminar, University of Alaska-Fairbanks, Fairbanks, Alaska, August, 2002.

Small scale ocean mixing. Code 32 Symposium, Office of Naval Research, Arlington, Virginia, April, 2003.

Small-scale bathymetry and ocean mixing. ABYSS Meeting, Johns Hopkins University, Laurel, Maryland, May, 2003.

Parameterizing internal tide driven mixing. Geophysical Fluid Dynamics Lab Seminar, Princeton University, Princeton, New Jersey, June, 2003.

Internal tide driven mixing in the abyssal Brazil Basin. Hawaii Ocean Mixing Experiment Meeting, Mt. Hood, Oregon, August, 2003.

Abyssal and tidal mixing processes. CLIVAR Workshop, Princeton University, Princeton, New Jersey, June, 2004.

Internal waves and turbulence measurements in the South China Sea. South China Sea Workshop, National Taiwan University, Taipei, Taiwan, October, 2004.

Global scale energy inputs, cascade processes, and turbulent mixing in the deep ocean. Physics Department Seminar, University of Rhode Island, Kingston, Rhode Island, December, 2004.

Global scale energy inputs, cascade processes, and turbulent mixing in the deep ocean. School of Earth and Ocean Science Seminar, University of Victoria, Victoria, British Columbia, Canada, February, 2005.

High-latitude process studies based on measurements of small-scale turbulence. International Arctic Research Center Seminar, University of Alaska-Fairbanks, Fairbanks, Alaska, July, 2005.

Energy dissipation of nonlinear waves on the South China Sea continental shelf. South China Sea Workshop, San Francisco, California, August, 2005.

Nonlinear internal wave generation, conversion, and dissipation in the South China Sea. Physical Oceanography Department Seminar, Florida State University, Tallahassee, Florida, February, 2006.

Energy dissipation studies in the South China Sea. Office of Naval Research Regional Review, University of Miami, Miami, Florida, March, 2006.

Energy dissipation studies in the South China Sea. Physical Oceanography Department Seminar, Naval Research Laboratory, Stennis, Mississippi, May, 2006.

NLIWI hypotheses, questions, and field program in 2007. South China Sea Workshop, National Sun Yat-Sen University, Kaohsiung, Taiwan, November, 2006.

Nonlinear internal wave generation, conversion, and dissipation in the South China Sea. Courant Institute Seminar, New York University, New York, New York, March, 2007.

Nonlinear internal wave generation, conversion, and dissipation in the South China Sea. Physical Oceanography Department Seminar, Oregon State University, Corvallis, Oregon, June, 2007.

Nonlinear internal wave generation, conversion, and dissipation in the South China Sea. Physical Oceanography Department Seminar, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts, July, 2007.

Turbulent dissipation in the wake of a Western Pacific Typhoon. ONR Typhoon DRI Workshop, Taipei, Taiwan, March, 2008.

Internal wave energy, dissipation, and turbulence along the margins of the South China Sea. Physical Oceanography Department Seminar, Woods Hole Oceanographic Institution. Woods Hole, Massachusetts, May, 2008.

Hydrodynamic, thermodynamic, and acoustic properties of large-amplitude internal waves. 1st ESF Exploratory Workshop on Seismic Oceanography, Begur, Spain, November, 2008.

Energy dissipation of large-amplitude internal waves in the South China Sea, Florida State University, Oceanography Department seminar, April 2009.

Mixing rates within and below the thermocline transition layer. WHOI PO Department seminar. August 2009.

Turbulence measurements during the ITOP cold wake study. ONR ITOP planning workshop in Taichung, Taiwan, November 2009.

Internal wave driven turbulence in the Luzon Passage. ONR IWISE planning workshop in Taichung, Taiwan, November 2009.

The role of vertical processes on sea-surface salinity. NASA Sea-surface salinity workshop, Pasadena, December 2009.

Concurrent measurements of beaked whale clicks, physical oceanography, and prey fields in the Tongue of the Ocean, Bahamas. ONR Marine Mammal Program Review, Washington DC, December 2009.

Internal waves and turbulence in the S. China Sea. URI department of Physics. December 2009.

Energetic and turbulence properties of large-amplitude internal waves in the S. China Sea. Banff International Research Station workshop on Internal Waves. April 2010.

International collaborations for research in the South China Sea. Vietnam – U.S. Oceanographic Collaboration workshop. San Diego, April 2010.

Tides, internal waves, and turbulence properties of the South China Sea. University of Wyoming Department of Geology and Geophysics Distinguished Lecture Series. Larmie, Wyoming, November 2010.

Observing and modeling sub-mesoscale processes in the S. China Sea. ONR workshop in Hai Phong, Vietnam. December 2010.

Internal wave driven turbulence in the Luzon Passage. ONR IWISE planning workshop in Taipei, Taiwan, January 2011.

Internal waves at mid-ocean ridges. Ecole de Physique workshop on Geophysical and Astrophysical Internal Waves, Les Houches, France, February 2011.

Turbulence measurements and vertical mixing rates in the Southern Ocean. MIT Sack Lunch Seminar, February 2011.

Turbulence measurements and vertical mixing rates in the Southern Ocean. SMAST department seminar, UMass-Dartmouth, April 2011.

Turbulence and mixing in the global ocean. Institute of Geology and Geophysics, Chinese Academy of Sciences China, October 2011.

Turbulence and mixing in the global ocean. College of Physical and Environmental Oceanography, Ocean University of China, October 2011.

Turbulence and internal waves in the South China Sea. College of Physical and Environmental Oceanography, Ocean University of China, October 2011.

Turbulence and mixing in Drake Passage, WHOI PO Department seminar, December 2011.

Turbulence and mixing in Drake Passage, URI/GSO PO Department seminar, University of Rhode Island, April 2012.

Turbulence and mixing in Drake Passage, GFDL Department seminar, NOAA GFDL, May 2012.

Near surface turbulence properties in the Bay of Bengal, ONR Workshop, Colombo Sri Lanka, November 2012.

Microstructure and turbulent mixing during fall 2012 SPURS, NASA workshop, RSMAS U. Miami, January 2013.

The Kuroshio Current, internal waves, and turbulence in the Luzon Strait and South China Sea, SMAST Department seminar. UMASS-Dartmouth, February 2013.

The Kuroshio Current, internal waves, and turbulence in the Luzon Strait, Colorado State University Department of Civil Engineering, June, 2013.

Overview of Climate Process Team on Representing internal-wave driven mixing in global ocean models, CLIVAR annual meeting, Annapolis MD, July 2013.

Overview of Diapycnal and Isopycnal Mixing Experiment in the Southern Ocean, CLIVAR annual meeting, Annapolis MD, July 2013.

Submesoscale cascade processes in the South China Sea. ONR Taiwan DRI Workshop, Seattle, August 2013.

CONFERENCE PROCEEDINGS AND ABSTRACTS

St. Laurent, L. (1999**)** Mixing and buoyancy forcing in an abyssal basin. North Atlantic Workshop of the World Ocean Circulation Experiment, Institut fur Meereskunde, Universitat Kiel, Kiel, Germany.

Jayne, S.R., and L.C. St. Laurent. (2000). A parameterization for dissipation over rough topography with applications to the tides. Ocean Sciences Meeting of the American Geophysical Union, San Antonio, Texas.

St. Laurent, L.C., J.M. Toole, R.W. Schmitt, and K.L. Polzin. (2000). Buoyancy forcing by turbulence above rough topography in the abyssal Brazil Basin. Ocean Sciences Meeting of the American Geophysical Union, San Antonio, Texas.

St. Laurent, L. (2001). Mixing and diapycnal advection in the ocean. `Aha Huliko`a Hawaiian Winter Workshop of the Office of Naval Research, University of Hawaii at Manoa, Honolulu, Hawaii.

St. Laurent, L., and C. Garrett. (2002). The role of internal tides in mixing the deep ocean. Ocean Sciences Meeting of the American Geophysical Union, Honolulu, Hawaii.

Garrett, C., S. Stringer, and L. St. Laurent. (2002). Simple models of internal tide generation at abrupt topography. Ocean Sciences Meeting of the American Geophysical Union, Honolulu, Hawaii.

Jayne, S.R., L.C. St. Laurent, and H.L. Simmons. (2002). Parameterizing tidal dissipation and diapycnal mixing over rough topography. Ocean Sciences Meeting of the American Geophysical Union, Honolulu, Hawaii.

Simmons, H.L., L. St. Laurent, S. Jayne, and A. Weaver. (2002). The influence of internal tide driven mixing on the oceanic general circulation. Ocean Sciences Meeting of the American Geophysical Union, Honolulu, Hawaii.

St. Laurent, L. (2003). The role of internal tides in mixing the deep ocean. Quad-Annual Assembly *sponsored by* the International Union of Geodesy & Geophysics and the International Association for the Physical Sciences of the Oceans, Sapporo, Japan.

St. Laurent, L. (2003). On the fraction of baroclinic tidal energy radiated away from topography. `Aha Huliko`a Hawaiian Winter Workshop *sponsored by* the Office of Naval Research, University of Hawaii at Manoa, Honolulu, Hawaii.

Simmons, H., S. Jayne, L. St. Laurent, and A. Weaver. (2003). Tidally driven mixing in a numerical model of the ocean general circulation. Annual Meeting of the European Geophysical Union, Nice, France.

St. Laurent, L., H. Simmons, and S. Jayne. (2003). Parameterizing tidally driven mixing in the deep ocean. Annual Meeting of the European Geophysical Union, Nice, France.

St. Laurent, L. (2004). Internal tides and ocean mixing. Scientific Committee on Oceanic Research Workshop on Ocean Mixing of the International Association for the Physical Sciences of the Oceans, Victoria, British Columbia, Canada.

St. Laurent, L. (2004). Abyssal and tidal mixing processes. CLIVAR Ocean Modeling Workshop, Geophysical Fluid Dynamics Laboratory, Princeton, New Jersey.

St. Laurent, L. (2004). Deep basin mixing and internal tides. Ocean Sciences Meeting of the American Geophysical Union, Portland, Oregon.

St. Laurent, L., and H. Simmons. (2004). On the power consumed by mixing in the ocean interior. Annual Meeting of the European Geophysical Union, Nice, France.

Dewar, W.K., R.J. Bingham, R.L. Iverson, D.P. Nowacek, L.C. St. Laurent, and P.H. Wiebe. (2004). Ocean bioturbation. Annual Meeting of the American Geophysical Union, San Francisco, California.

St. Laurent, L., and H. Simmons. (2004). The power consumed by mixing processes in the deep-ocean interior. Annual Meeting of the American Geophysical Union, San Francisco, California.

Thurnherr, A.M., L.C. St. Laurent, K.G. Speer, J.M. Toole, and J.R. Ledwell. (2004). Mixing associated with sills in a canyon on the mid-ocean ridge flank. Ocean Sciences Meeting of the American Geophysical Union, Portland, Oregon.

St. Laurent, L. (2006). Turbulent diffusivities and mechanical power consumption by mixing in the ocean interior. Ocean Sciences Meeting of the American Geophysical Union, Honolulu, Hawaii.

St. Laurent, L.C., A.M. Thurnherr, G. Reverdin, P. Bouruet-Aubertoto, and V. Ballu. (2006). Overflow turbulence on the Mid-Atlantic Ridge. Annual Meeting of the American Geophysical Union, San Francisco, California.

Thurnherr, A.M., L. St. Laurent, G. Reverdin, P. Bouruet-Aubertoto, and V. Ballu. (2006). Overflows on the Mid-Atlantic Ridge. Annual Meeting of the American Geophysical Union, San Francisco, California.

Speer, K., and L. St. Laurent. (2006). Direct measurements of upper ocean diapycnal mixing in the Antarctic Zone of the Southern Ocean. Ocean Sciences Meeting of the American Geophysical Union, Honolulu, Hawaii.

Tharawechrak, S., and L. St. Laurent. (2006). Nonlinear waves and turbulence on the continental shelf of the South China Sea. Ocean Sciences Meeting of the American Geophysical Union, Honolulu, Hawaii.

St. Laurent, L., A.M. Thurnherr, G. Reverdin, P. Bouruet-Aubertoto, and V. Ballu. (2007). Overflow turbulence on the Mid-Atlantic Ridge. Quad-Annual Assembly of the International Union of Geodesy & Geophysics and the International Association for the Physical Sciences of the Oceans, Perugia, Italy.

Thurnherr, A.M., L. St. Laurent, G. Reverdin, P. Bouruet-Aubertoto, and V. Ballu. (2007). Overflows on the Mid-Atlantic Ridge. Quad-Annual Assembly of the International Union of Geodesy & Geophysics and the International Association for the Physical Sciences of the Oceans, Perugia, Italy.

St. Laurent, L. C., H. L. Simmons, and Y. H. Wang, (2008). Energy dissipation of large amplitude nonlinear waves in the South China Sea. Ocean Sciences Meeting of the American Geophysical Union, Orlando, Florida.

Rahter, B. A., and L. St. Laurent (2008). Turbulent mixing in the mixed layer/thermocline transition layer. Ocean Sciences Meeting of the American Geophysical Union, Orlando, Florida.

Simmons, H. and L. St. Laurent (2008). Dynamic modeling of nonlinear internal waves in the South China Sea. Ocean Sciences Meeting of the American Geophysical Union, Orlando, Florida.

Wang, Y., and L. St. Laurent (2008). Observations of internal wave impinging at Dongsha atoll in South China Sea. Ocean Sciences Meeting of the American Geophysical Union, Orlando, Florida.

St. Laurent, L. C., and H. L. Simmons (2008), Energy dissipation of large amplitude nonlinear waves in the South China Sea. Annual Meeting of the American Geophysical Union, San Francisco, California.

Thurnherr, A. M., A. Ruiz Angulo, and L. St. Laurent (2009). Diapycnal mixing on the East Pacific Rise near 10N. Presented at the MOCA/IAPSO Assembly, Montreal, July 2009.

Rahter, B. and L. St. Laurent (2009). Observations of turbulent mixing in the transition layer. Presented at the MOCA/IAPSO Assembly, Montreal, July 2009.

Ruiz-Angulo, A., A.M. Thurnherr and L. St. Laurent (2009). Direct comparison of finestructure parameterization with microstructure. Presented at the MOCA/IAPSO Assembly, Montreal, July 2009.

Rahter, B., and L. St. Laurent (2010). Observations of turbulent mixing in the transition layer. Seismic images across the Luzon Passage and South China Sea: Internal waves, turbulence, and mixing. Ocean Sciences Meeting of the American Geophysical Union, Portland, Oregon.

Holbrook, W. S., L. St. Laurent, R. W. Schmitt, H. L. Simmons, and D. H. Eakin (2010). Seismic images across the Luzon Passage and South China Sea: Internal waves, turbulence, and mixing. Ocean Sciences Meeting of the American Geophysical Union, Portland, Oregon.

Thurnherr, A. M., L. St. Laurent, and H. L. Simmons (2012). 3-D Field associated with hydraulic flow, internal waves and turbulence over a topographic ridge in Luzon Strait. Ocean Sciences Meeting of the American Geophysical Union, Salt Lake City, Utah.

Fu, K. H., L. St. Laurent, H. Simmons, O. Sun, and A. Thurnherr (2012). Turbulence dissipation rate and mixing on the Lan-Yu Ridge of the Luzon Passage. Ocean Sciences Meeting of the American Geophysical Union, Salt Lake City, Utah.

Simmons, H. S., M. H. Alford, J. A. Mackinnon, K. I. Martini, J. D. Nash, and L. St. Laurent (2012). Simulations and observations of strong baroclinic generation and nonlinear waves in the South China Sea. Ocean Sciences Meeting of the American Geophysical Union, Salt Lake City, Utah.

Holbrook, W. S., A. von Lanken, W. Fortin, H. Simmons, L. St. Laurent, R. Schmitt, and D. Eakin (2012). Imaging the generation sites and internal structure of large non-linear internal waves across the Luzon passage and South China Sea. Ocean Sciences Meeting of the American Geophysical Union, Salt Lake City, Utah.

Sun, O. M., L. St. Laurent, and K. L. Polzin (2012). A zeroth-order, observationally based parameterization for vertical diffusivity in the thermocline. Ocean Sciences Meeting of the American Geophysical Union, Salt Lake City, Utah.

GRANT AWARDS

DURIP: Autonomous turbulence sampling systems for use in ONR programs. L. St. Laurent. Funded by Office of Naval Research. 7/1/2013 – 6/30/2014. Total award $558,170.

The Sub-mesoscale Cascade of the South China Sea (SCSCS). St. Laurent, L. and H. Simmons. Funded by Office of Naval Research. 3/1/2013-2/28/2016. Total award $998,408

Dissipative processes over the Vietnam shelf and slope in the South China Sea. St. Laurent, L. and E. Shroyer. Funded by Office of Naval Research. 1/01/2012-12/31/2014. Total award $997,723.

Collaborative Research: Microstructure and Mixing Measurements During SPURS. Schmitt, R., L. St. Laurent and C. Clayson. Funded by National Science Foundation. 1/01/2011-12/31/2013. Total award $1,371,560.

Collaborative Research: Representing Internal-Wave Driven Mixing in Global Ocean Models. MakKinnon, J., R. Pinkel, M. Alford, M. Gregg, B. Arbic, E. Chassignet, M. Jochum, F. Bryan, G. Danabasaoglu, P. Gent, W. Large, H. Simmons, S. Jayne, L. St. Laurent, and K. Polzin. Funded by National Science Foundation. 6/15/2010-5/31/2013. Total award $807,535.

Internal wave generation processes at deep-sills in the Luzon Passage region of the South China Sea. St. Laurent, L. and H. Simmons. Funded by Office of Naval Research. 1/1/2009-12/31/2013. Total award $786,342

Prey fields and habitat of deep divers: 3D characterization and modeling of beaked and sperm whale foraging areas in the Tongue of the Ocean. Nowacek, D., P. Halpin, T. Stanton, L. St. Laurent, and P. Tyack. Funded by Office of Naval Research. 5/1/2008-4/30/2010. Total award $825,593.

Observations of Energy Dissipation in the Wake of a Western Pacific Typhoon. St. Laurent, L. Funded by Office of Naval Research. 1/1/2008-12/31/2010. Total award $565,197.

Internal wave energy budget studies in the South China Sea. St. Laurent, L., and H. Simmons. Funded by Office of Naval Research. 1/1/2008-12/31/2009. Total award $253,172.

Collaborative Research: Diapycnal Mixing on the East Pacific Rise. Thurnherr, A., and L. St. Laurent. Funded by National Science Foundation. 8/1/2007–7/31/2009. Total award $563,848.

Collaborative Research: DIMES: Diapycnal and Isopycnal Mixing in the Southern Ocean. Speer, K. L. St. Laurent, and P. Lazarevich. Funded by National Science Foundation. 7/1/2007–6/30/2012. Total award $2,631,333.

Turbulence properties in the mixed layer/thermocline transition layer. St. Laurent, L. Funded by National Science Foundation. 3/1/2007-2/28/2009. Total award $137,289.

Collaborative Research: Mixing, flow and hydrography in the rift valley of the Lucky Strike segment (37:20N, Mid-Atlantic Ridge). Thurnherr, A. and L. St. Laurent. Funded by National Science Foundation. 3/1/2006-2/29/2008. Total award $319,514.

Internal wave energy budget studies in the South China Sea. St. Laurent, L., and H. Simmons. Funded by Office of Naval Research. 10/1/2004-9/31/2007. Total award $443,180.

Energy dissipation studies in the South China Sea. St. Laurent, L. Funded by Office of Naval Research. 10/1/2004-9/31/2006. Total award $154,390.

New instrumentation for measuring mixing rates in the high latitude oceans. St. Laurent, L., K. Speer, and C. Clayson. Funded by FSU Research Foundation - Program Enhancement Grant 5/1/2004 – 4/30/2006. Total award $98,712.

A profiling system for enhancement of ocean turbulence studies. Speer, K. and L. St. Laurent. Funded by Office of Naval Research - Defense University Research Instrumentation Program, 10/1/2004-9/31/2006. Total award $172,900.

Interior and marginal mixing rate measurements for the Canada Basin of the Arctic Ocean. Speer, K., and L. St. Laurent. Funded by Office of Naval Research. 10/1/2003-9/31/2007. Total award $368,160.