TETJANA ROSS

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Last updated: May 11, 2016

RESEARCH INTERESTS

Ocean observation with particular emphasis on physical-biological interactions; acoustic scattering from oceanic zooplankton, turbulence, double diffusive interfaces and biological/physical thin layers; small-scale bio-physical interactions; importance of double-diffusion in Polar Regions; distinguishing acoustic scatter from biotic and physical sources; turbulence theory.

EDUCATION

PhD., *Ocean Physics,* University of Victoria, *Sound scattering from oceanic turbulence*, 2003
B.Sc., *Physics (First Class Honours),* University of Manitoba, 1998

ACADEMIC AND RESEARCH POSITIONS

2015-present **Research Scientist** (SE-RES-03, Institute of Ocean Sciences, Fisheries and Oceans Canada)

2011-present **Associate Professor** (Dept. of Oceanography and College of Sustainability *cross-appointment*, Dalhousie University)

2005-2011 **Assistant Professor and NSERC UFA** (Dept. of Oceanography, Dalhousie)

2003-2005 **Postdoctoral Scholar** (Woods Hole Oceanographic Institution)

2000-2003 **Doctoral Candidate** (University of Victoria)

1998-2000 **Masters Candidate** (University of Victoria)

1997 **University of Manitoba Summer Student**, Computer modeling of a Condensed Matter System (University of Manitoba)

1996 **Research Assistant**, Influence of Hydrogen on the Magnetoresistance of Nb/Fe Multilayers (Hahn-Meitner-Institut, Berlin, Germany)

1994&1995 **NSERC Summer Student**, Parity Violation in Proton-Proton Scattering (TRIUMF, University of British Columbia)

REFEREED PUBLICATIONS (underlined names are students I have advised)

Eddy Carmack, Igor Polyakov, Laurence Padman, Ilker Fer, Elizabeth Hunke, Jennifer Hutchings, Jennifer Jackson, Daniel Kelley, Ron Kwok, Chantelle Layton, Humphrey Melling, Donald Perovich, Ola Persson, Barry Ruddick, Mary-Louise Timmermans, John Toole, **Tetjana Ross**, Stephen Vavrus, and Peter Winsor, "Towards quantifying the

increasing role of oceanic heat in sea ice loss in the new Arctic", *Bulletin of the American Meteorological Society*, **96**: 2079-2105, 2015.

Keir Colbo*, **Tetjana Ross**, Craig Brown and Tom Weber, "A review of oceanographic applications of water column data from multibeam echosounders", *Estuarine, Coastal and Shelf Science, invited feature*, **145**:41-56, 2014.

Tetjana Ross, "A video-plankton and microstructure profiler for the exploration of in situ connections between zooplankton and turbulence", *Deep Sea Research I*, **89**:1-10, 2014.

Tetjana Ross, Julie Keister and Ana Lopez, "On the use of high-frequency broadband sonar to classify biological scattering layers from a cabled observatory in Saanich Inlet, British Columbia", *Methods in Oceanography*, **5**:19-38, 2013.

Kimberley Davies, **Tetjana Ross** and Christopher Taggart, "Tidal and residual current influence on copepod aggregations along a shelf-basin margin", *Marine Ecology Progress Series*, **479**:263-282, 2013.

Doris Leong, **Tetjana Ross** and Andone Lavery, "Anisotropy in broadband acoustic scattering from internal solitary waves", *Journal of the Acoustical Society of America*, **132**:670-679, 2012.

Amy Roy, Anna Metaxas and **Tetjana Ross**, "Swimming patterns of larval Strongylocentrotus droebachiensis in turbulence in the laboratory", *Journal of Experimental Marine Biology and Ecology,* **453**:117-127, 2012.

Tetjana Ross and Andone Lavery, "Acoustic scattering from density and sound speed gradients: Modeling of oceanic pycnoclines", *Journal of the Acoustical Society of America – Express Letters,* **131**:EL54-EL60, 2012.

Tetjana Ross and Andone Lavery, "Acoustic detection of oceanic double-diffusive convection: A feasibility study", *Journal of Oceanic and Atmospheric Technology,* **27**:580–593, 2010.

Jessica Sameoto, **Tetjana Ross**, and Anna Metaxas, **"**The effect of flow on larval vertical distribution of the sea urchin, *Strongylocentrotus droebachiensis*", *Journal of Experimental Marine Biology and Ecology*, **383**:156–163, 2010.

Tetjana Ross and Andone Lavery, "Laboratory observations of double-diffusive convection using high-frequency broadband acoustics", *Experiments in Fluids*, **46**:355–364, 2009.

Andone Lavery and **Tetjana Ross**, "Acoustic scattering from double-diffusive microstructure", *Journal of the Acoustical Society of America*, **122**:1449-1462. 2007.

Tetjana Ross, Isabelle Gaboury and Rolf Lueck, "Simultaneous acoustic observations of turbulence and zooplankton in the ocean", *Deep Sea Research I*, **54**:143-153, 2007.

Tetjana Ross and Rolf Lueck, "Estimating turbulent dissipation rates from acoustic backscatter", *Deep Sea Research I,* **52**:2353–2365, 2005.

Tetjana Ross, Chris Garrett and Rolf Lueck, "On the turbulent co-spectrum of two scalars and its effect on acoustic scattering from oceanic turbulence", *Journal of Fluid Mechanics*, **514**:107-119, 2004.

* Research Associate

Tetjana Ross and Rolf Lueck, "Sound scattering from oceanic turbulence", *Geophysical Research Letters*, **30**, 1343, doi:10.1029/2002GL016733, 2003.

Tetjana Ross, Chris Garrett and Pierre-Yves Le Traon, "Western Mediterranean sea-level rise: changing exchange flow through the Strait of Gibraltar", *Geophysical Research Letters*, **27**:2949-2952, 2000.

Submitted:

Anne Marie Ryan, Alexandra Arnott, Roderick Chisholm, Laura deGelleke, Lara Gibson, Debra Grantham, Stephanie Kienast, Martha Mullally, **Tetjana Ross**, Allison Schmidt, Leanne Stevens and Elizabeth Welsh, "Conversations in a coffee shop: voices from the trenches of a community of teaching practice of university science faculty", submitted to *Transformative Dialogues: Teaching and Learning Journal*, May 7, 2016.

INVITED PRESENTATIONS (only in last 5 years)

- **Untersteiner Workshop, Fairbanks AK, USA** (2013)
- **Institute of Marine Sciences (ICM-CSIC), Barcelona** (2013)
- **Institute of Marine and Coastal Sciences, Rutgers University** (2012)
- **161st Meeting of the Acoustical Society of America** (in an Educational Session) (2011)
- **Institut des sciences de la mer de Rimouski, Université du Québec à Rimouski** (2011)

CONFERENCE PRESENTATIONS (first authored or presented by me and in last 5 years)

- **Tetjana Ross** "El Nino, the Blob and another warmest year". 2015 State of the Pacific Ocean Meeting, Mar 1-2 2016, Nanaimo BC.
- **Tetjana Ross**, Susanne Craig, Mathieu Dever, Matthew Beck, Adam Comeau, and Richard Davis "The Physical Context of Seasonal and Inter-Annual Variability in Phytoplankton across the Scotian Shelf: Insights from Profiling Gliders" (poster). 2016 Ocean Sciences Meeting, Feb 21-26 2016, New Orleans, LA, USA.
- **Tetjana Ross** and Gennavieve Ruckdeschel "Surveying right whale habitats using glider-mounted sonar". MEOPAR Annual Science Meeting 2015, June 16-18, Vancouver, BC.
- **Tetjana Ross**, Kim Davies, Chris Taggart, Adam Comeau, Richard Davis, Mark Baumgartner, Bruce Martin, and Gennavieve Ruckdeschel "Surveying right whale habitats using glider-mounted sonar". CMOS Congress 2015, June 1-4, 2015, Whistler, BC.
- **Tetjana Ross**, Mireia Artigas, Oliver Ross, Norma Neszi and Elisa Berdalet "Exploring the use of acoustics in monitoring harmful algal blooms in Alfacs Bay (a Mediterranean lagoon)". CMOS Congress 2014, June 1-5 2014, Rimouski, Quebec.
- **Tetjana Ross**, "An introduction to double-diffusion and its observation", Untersteiner Workshop: On the Role and Consequences of Ocean Heat Flux in Sea Ice Melt, Mar 19-21, 2013, Fairbanks AK, USA, *invited talk*.
- Nick Dourado, **Tetjana Ross** and Paul Hill. "Acoustic detection of sediment-laden ice blocks" (poster). CMOS/AMS Congress 2012, May 29 to June 1 2012, Montreal, Quebec.
- Kimberley Davies, Chris Taggart and **Tetjana Ross**, "Tidal advection of food explains the right whale historical distribution in Roseway Basin". CMOS/AMS Congress 2012, May 29 to June 1, 2012, Montreal, Quebec.
- **Tetjana Ross**, Wu-Jung Lee, Julie Keister, Ana Lopez and Charles Greene, "Broadband

acoustics on the VENUS observatory in Saanich Inlet" (poster). 2012 Ocean Sciences Meeting, February 20-24 2012, Salt Lake City, Utah, USA.

- **Tetjana Ross** and Candace Smith, "Co-incident in-situ observations of turbulence and zooplankton with a new biophysical profiler", 45th Annual CMOS Congress, June 5 - 9 2011, Victoria BC.

GRANTS (held in last 5 years)

Principal Investigator:

2013-2018	NSERC Discovery Grant	27,000 p/a
2012	Nova Scotia Office of Economic Development Strategic Cooperative Education Incentive program	4,368
2011-2012	NSERC Engage Grant, Water column uses of multi-beam sonar	24,830
2009-2014	CFI, Infrastructure Operating Fund	5,000 p/a
2008-2013	NSERC Discovery Grant	20,000 p/a

Co-applicant:

2017-2019	NSERC NCE (MEOPAR) (WHaLE Phase II) PI: Chris Taggart, other co-applicant: Dave Duffus	318,600
2014-2017	NSERC NCE (MEOPAR) (WHaLE Phase I) PI: Chris Taggart, other co-applicant: Dave Duffus	748,000
2014-2016	NSERC Research Network Grant (OTN) PI: Sara Iverson, 26 other co-applicants	3,793,665
2010-2013	NSERC Strategic Project Grants PI: Paul Hill, other co-applicant: Alex Hay	345,240
2010-2012	CFI, Special Operating Funds (VENUS) PI: Verena Tunnicliffe, 10 other co-applicants	1,249,985 p/a

NATIONAL/INTERNATIONAL COMMITTEES, EDITORSHIPS

2015-present	**Canadian Meteorological and Oceanographic Society** Member of Awards and School and Public Education committees
2015-present	**IEEE Journal of Oceanic Engineering**, Associate Editor
2013-2015	**ONC DATA Portal Consultation group**, Member
2012-2015	**Canadian Meteorological and Oceanographic Society** Councillor-at-large
2011-2013	**NEPTUNE Canada** Users Committee member
2007-2009	**2009 Canadian Metrological and Oceanographic Society Congress**, Science Program Committee member
2006	**Ocean Research Interactive Observatory Networks (ORION)** Sensors committee member

JOURNALS/ORGANIZATIONS FOR WHICH I HAVE ACTED AS A REVIEWER

Continental Shelf Research; Limnology and Oceanography; Geophysical Research Letters; Journal of the Acoustical Society of America; Annales Geophysicae; National Science Foundation; National Science and Engineering Research Council.

OCEANOGRAPHIC FIELD EXPERIENCE

- **scientific head of OTN glider program** (since Jan 2014, I perform a role similar to chief-scientist, giving scientific direction to the missions with the 3 Slocum gliders, a team of technicians deploys them and monitors their progress)
- **participated in ten large oceanographic cruises and numerous smaller cruises**
- **proficient with standard oceanographic equipment**: echosounders, Acoustic Doppler Current Profilers, Conductivity, Temperature and Depth sensors, and plankton nets
- **familiar with specialized equipment** such as the Towed Ocean Microstructure Instrument, the CTD-mountable Microstructure Profiling System, the Microstructure Sampling System, Vertical Microstructure Profiler and two zooplankton imaging system (ZOOVIS and VPR)
- **helped prepare, deploy and recover moorings** (with bottom mounted Acoustic Doppler Current Profilers, current meters and thermistor chains)
- **directed the design and testing of a novel new instrument:** a combination of microstructure profiler and Video Plankton Recorder (VPR)

TEACHING

- **Dalhousie University**, (2005–2015).

OCEA 1000 Conversations with Ocean Scientists 2013/14, 14/15

I developed and teach a new full-year undergraduate course that introduces students to the breath of ocean science and teaches them how to write as scientists. This course generated a journal: http://oceansfirstjournal.com/

SUST 4900 Honours Thesis 2013/14, 14/15

I lead the co-teaching of this seminar course guiding College of Sustainability students through the preparation of a thesis on a diverse range of topics.

OCEA 5240 Special Topics in Oceanography Winter 2008-2012

I developed and coordinated a new graduate course allowing students to broaden their studies with a mix-and-match of three month-long "mini-courses", two of which I teach.

OCEA/PHYC 4311/5311 Fluid Dynamics I Fall 2007, 2009

The scientific basics of fluid dynamics; emphasis on geophysically important aspects.

Other College of Sustainability Teaching

SUST 1000:	2 joint lectures (tidal power and oceans)	Fall 2011, 13, 14
SUST 2000:	1 joint lecture (quantitative evidence)	Fall 2011, 13
SUST 4000/4900:	2 research panels (literature and evidence)	Fall 2011
SUST 1001:	3 lectures, 1 tutorial [Ocean's role in Climate (with tutorial); Climate change in ocean, ocean sustainability issues]	Winter 2012, 14, 15

- **WHOI/MIT Joint Program in Oceanography**, *Postdoctoral Teaching Fellow* (2004)
  Introduction To Observational Physical Oceanography (12.808)

- **University of Victoria**, Dept. of Physics and Astronomy, *Teaching Assistant* (1998-2002)
- **University of Manitoba**, Department of Mathematics, *Teaching Assistant* (1996-1998)

SUPERVISORY EXPERIENCE

- **Supervisor**

Gennavieve Ruckdeschel	MSc (Jun. 2014-present)
Dylan Degrace	MSc (Aug. 2013-present)
Nicholas Dourado	MSc (Jan. 2012-Mar. 2015)
Candace Smith	MSc (Sept. 2009-Oct. 2012)
Doris Leong	MSc (Sept. 2006- Apr. 2009)
Gennavieve Ruckdeschel	Combined Biol./Oceanography Honours (2013-2014)
Teresa Danyluk	Combined Biol./Oceanography Honours (2013-2014)
Callum Colvine	Undergrad co-op student (2016, Comp. Sci. (UVic))
Kirk Herman	Undergrad co-op student (2012, Env. Engineering)
Beth MacEachern	Undergrad co-op student (2010, Biology)
Ivan Kostylev	Undergrad co-op student (2008, Physics)
Caitlin Gerber	Undergrad co-op student (2006, Marine Biology)

- **Co-supervisor**

Tara Howatt (UBC)	PhD (2016-present); co-supervisor: Dr S. Waterman (UBC)
Robert Paterson	Undergrad co-op student (2011, Mech. Engineering)
Amy Roy	Combined Mar. Biol./Oceanography Honours (2009-2010)
Edward Marchant	Combined Mar. Biol./Oceanography Honours (2009-2010)
Andria Logan	Combined Mar. Biol./Oceanography Honours (2005-2006)

SCIENCE OUTREACH (2005-present)

- giving **interactive presentations**, "Sound in the ocean", to three grade 4/5 classes (2016; in french), a Brownies group (2015), grade **3/4** (2014) **4 and 4/5** classes (2010)
- giving an **interactive presentation**, "Funny Ice", to multiple grade **2** classes (2014)
- presenting at the Let's Talk Science Ocean Science Symposium for high-school students (Mar 2013)
- visiting classrooms to talk about Arctic sea ice and marine animals: grades **P** (twice: 2013; 2012) and multiple classes covering **P-6** (2008)
- organizing and presenting acoustical and physical oceanography components of **2012 Halifax EdGeo (edgeo.org) workshop for P-12 teachers** (Aug, 2012)
- answering questions submitted by students (7-Uni); **MadSci.org Network** (2005-present)
- performing a curriculum review for a high school science chapter on Ocean Currents for the Center for Science Education (EDC, Inc., Newton, MA) (2008)
- interviewee for a segment on the tides for an episode on the Moon as part of the History Channel's series entitled "The Universe" (2007)