

## Curriculum Vitae

**Pierre St-Laurent**  
Research scientist  
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## Academic Appointments

Assistant research scientist, Virginia Institute of Marine Science, USA.	2016–Present
Post-doctoral research associate, Virginia Institute of Marine Science, USA.	2015
Research scientist, Old Dominion University, USA.	2017–Present
Post-doctoral research associate, Old Dominion University, USA.	2010–2016

## Academic Background

Ph. D. Oceanography, Université du Québec à Rimouski, Canada Advisor: F. Straneo (Scripps Institution of Oceanography), F.J. Saucier (deceased) Thesis: Seasonal and interannual variability of freshwaters in Arctic Seas: The case of Hudson Bay Examiner: S.J. Déry (U. Northern British Columbia).	2010
M. Sc. Oceanography, Université du Québec à Rimouski, Canada Advisor: J.-F. Dumais (retired) and F.J. Saucier (deceased) Thesis: Generation and propagation of barotropic waves in Foxe Basin, Hudson Strait, and Hudson Bay Examiner: C.J.R. Garrett (retired).	2006
B. Sc. Physics Université Laval, Canada	2003

## Research Grants

NSF PLR–1443657, Collaborative research: Investigating the role of mesoscale processes and ice dynamics in carbon and iron fluxes in a changing Amundsen Sea (INSPIRE)  
Role: Lead principal investigator  
Award period: July 15, 2015 to June 30, 2018  
Award amount: \$154,951 to ODU.

NSF XSEDE OCE–160013, Predicted impacts of changing climate and land-use on Chesapeake Bay water quality and biogeochemistry  
Role: Co-PI (lead PI: M. Friedrichs)  
Award period: Oct. 1, 2016 to Mar. 31, 2019  
Award amount: \$46,437.84 (944,177 SUs and 20,000 GB).

## Contributions to Research

### *Refereed Publications*

Najjar, R.G., **P. St-Laurent** and 28 other authors (2018),  
Carbon budget of tidal wetlands, estuaries, and shelf waters of Eastern North America,  
Global Biogeochemical Cycles, 32, doi:10.1002/2017gb005790.

**St-Laurent, P.**, M.A.M. Friedrichs, R.G. Najjar, D.K. Martins, M. Herrmann, S.K. Miller and J. Wilkin (2017),  
Impacts of atmospheric nitrogen deposition on surface waters of the western North Atlantic mitigated by multiple feedbacks,  
J. Geophys. Res. Oceans, 122(11), p.8406-8426, doi:10.1002/2017jc013072.

**St-Laurent, P.**, P.L. Yager, R.M. Sherrell, S.E. Stammerjohn and M.S. Dinniman (2017),

Pathways and supply of dissolved iron in the Amundsen Sea (Antarctica),  
J. Geophys. Res. Oceans, 122(9), p.7135-7162, doi:10.1002/2017jc013162.

**St-Laurent, P.**, J.M. Klinck, and M.S. Dinniman (2015),  
Impact of local winter cooling on the melt of Pine Island Glacier, Antarctica,  
J. Geophys. Res. Oceans, 120(10), p.6718-6732, doi:10.1002/2015jc010709.

**St-Laurent, P.**, J.M. Klinck, and M.S. Dinniman (2013),  
On the role of coastal troughs in the circulation of warm Circumpolar Deep Water on Antarctic shelves,  
J. Phys. Oceanogr, 43(1), p.51-64, doi:10.1175/jpo-d-11-0237.1.

**St-Laurent, P.**, F. Straneo, and D.G. Barber (2012),  
A conceptual model of an Arctic Sea,  
J. Geophys. Res. Oceans, 117, C06010, doi:10.1029/2011jc007652.

**St-Laurent, P.**, F. Straneo, J.-F. Dumais, and D.G. Barber (2011),  
What is the fate of the river waters of Hudson Bay?,  
J. Mar. Syst., 88, p.352-361, doi:10.1016/j.jmarsys.2011.02.004.

Sutherland, D.A., F. Straneo, S.J. Lentz, and **P. St-Laurent** (2011),  
Observations of fresh, anticyclonic eddies in the Hudson Strait outflow,  
J. Mar. Syst., 88, p.375-384, doi:10.1016/j.jmarsys.2010.12.004.

**St-Laurent, P.**, F.J. Saucier, and J.-F. Dumais (2008),  
On the modification of tides in a seasonally ice-covered sea,  
J. Geophys. Res. Oceans, 113, C11014, doi:10.1029/2007jc004614.

Arbic, B.K., **P. St-Laurent**, G. Sutherland, and C. Garrett (2007),  
On the resonance and influence of the tides in Ungava Bay and Hudson Strait,  
Geophys. Res. Lett., vol. 34, L17606, doi:10.1029/2007gl030845.

Preprints of articles are available at <http://nordet.net/>

#### *Published datasets*

St-Laurent, P., E.E. Hofmann, P.L. Yager, R.M. Sherrell, S.E. Stammerjohn (2017),  
Numerical model simulating the sea ice and ocean conditions in the Amundsen Sea over the period Jan. 1, 2006 to Dec. 31, 2013 (INSPIRE project). Biological and Chemical Oceanography Data Management Office (BCO-DMO). dataset version 2017-08-30, <http://lod.bco-dmo.org/id/dataset/729546>

St-Laurent, P. and M.A.M. Friedrichs (2017),  
Numerical simulations of the biogeochemical impact of atmospheric nitrogen deposition on surface waters of the western North Atlantic, dataset, 1.1 terabytes, <https://doi.org/10.21220/V5KB03>

#### *Non-Refereed Publications*

Yager, P.L., in collaboration with P. St-Laurent, R.M. Sherrell, S.E. Stammerjohn and M.S. Dinniman (2017),  
Exploring the links between melting ice and ecosystems, Research Features magazine, issue 121, Dec. 2017.

Twarog, C., P. St-Laurent, E.E. Hofmann, D.L. Dickerson and A.H. Brown (2017),  
Ice pumps & Algae (educational booklet), ISBN 978-0-692-86607-8.

St-Laurent, P., Phytoplankton responses to nutrient enrichment in high and mid-latitude seas,  
Feature article in CCPO's Newsletter, Old Dominion University, vol.21, no 2, Spring 2016.

#### *Invited Seminars*

Physical drivers of the highly-productive Amundsen Sea Polynya, Antarctica,  
Old Dominion University, OEAS Seminars, Norfolk VA,  
Hosted by Frederick Dobbs, Apr. 6, 2017.

Effect of atmospheric nitrogen deposition on biological productivity in the Mid-Atlantic Bight, College of William & Mary, Virginia Institute of Marine Science (VIMS), Biol. Sci. Seminars, Gloucester Point VA, Hosted by Marjorie Friedrichs, Nov. 30, 2015.

Melt of ice shelves in western Antarctica: Its physical drivers and the effects on the marine environment, College of William & Mary, Virginia Institute of Marine Science (VIMS), Phys. Sci. Seminars, Gloucester Point VA, Hosted by Marjorie Friedrichs, Feb. 12, 2015.

Seasonal and spatial variability of glacial meltwater in the Amundsen Sea: Insight from numerical models, Columbia University, Lamont-Doherty Earth Observatory (LDEO), Ocean/Climate Phys. Div., Palisades NY, Hosted by Xiaojun Yuan, May 23, 2014.

*Presentations at professional meetings and published abstracts*

See Appendix.

## Professional Service

*Service to federal agencies and professional societies*

2017, Panelist, NSF, Alexandria VA

2016, Panelist, NSF, Arlington VA

2008–2009, Chair of Rimouski center, Canadian Meteorological & Oceanographic Society (CMOS)

*Proposal reviews*

2018 NSF Division of Ocean Sciences, Physical Oceanography Program

2017 NSF Division of Ocean Sciences, Physical Oceanography Program

2016 NSF Division of Ocean Sciences, Physical Oceanography Program (2 proposals)

2016 NSF Division of Polar Programs, Antarctic Ocean and Atmospheric Sciences

2015 NSF Division of Ocean Sciences, Physical Oceanography Program

2014 NSF Division of Polar Programs, Arctic Natural Sciences Program

2014 NSF Division of Ocean Sciences, Physical Oceanography Program

*Manuscript reviews*

2018 Ocean Modelling, Journal of Geophysical Research

2017 Journal of Geophysical Research

2016 Science, Geophysical Research Letters, Ocean Modelling, Arctic, Journal of Geophysical Research

2015 Journal of Physical Oceanography, Elementa, Journal of Geophysical Research

2014 Nature Geoscience, Geophysical Research Letters, Journal of Physical Oceanography, Journal of Atmospheric and Oceanic Technology, Ocean Science, Estuarine Coastal and Shelf Science

2013 Journal of Geophysical Research

2012 Ocean Modelling, Journal of Geophysical Research, Oceanography

2011 Journal of Physical Oceanography, Atmosphere–Ocean

2008 Atmosphere–Ocean

*Memberships of professional societies*

2018, Member of the American Meteorological Society (AMS), American Geophysical Union (AGU), Coastal and Estuarine Research Federation (CERF), International Glaciological Society (IGS), Canadian Meteorological and Oceanographic Society (CMOS).

### *Juried shows, exhibitions, and performances*

2014, Judge at Tidewater Science and Engineering Fair, Norfolk VA, March 15, 2014.  
2012, Judge at St. Pius X School's Annual Science fair, Norfolk VA, March 13, 2012.

## Field Experience

*RVIB N.B. Palmer*, 6 weeks, January 2012.

CTD profiling and nutrients sampling in the Ross Sea, Antarctica.

Project: Processes Regulating Iron Supply at the Mesoscale (PRISM), NSF ANT-0944165.

Chief Scientist: D. McGillicuddy (WHOI).

*CCGS Pierre Radisson*, 2 weeks, September 2006.

CTD profiling and mooring deployment/recovery in Hudson Bay, Hudson Strait and Foxe Basin, Canada.

Project: Climate and productivity of the Canadian Inland Seas (MERICA).

Chief Scientist: M. Harvey (DFO-Canada).

*R/V Coriolis II*, 1 week, May 2005.

CTD tow-yow and in-board ADCP collection over the sill of the Saguenay Fjord, Canada.

Chief Scientist: Y. Simard (UQAR/DFO-Canada).

## Contributions to Education

### *Graduate students committee service*

Member of advisory committee for *Fei Da* seeking M.Sc. at Virginia Institute of Marine Science: "Quantifying the effects of long-term changes in atmospheric nitrogen deposition on the Chesapeake Bay water quality", Major advisor: M.A.M. Friedrichs (VIMS), 2016–2018.

### *Others*

*Teaching Assistant*, Course OEAS 406/506 "Introduction to MATLAB", Old Dominion University, 2018.

*Instructor*, "Using ROMS-ECB on William & Mary's High Performance Cluster Chesapeake".

Virginia Institute of Marine Science (VIMS), Oct. 2,9, 2015.

*Teaching Assistant*, Course "Coastal and Estuarine Dynamics", Université du Québec (UQAR), 2006.

*Lecturer*, Summer School Program in Oceanography, Université du Québec (UQAR), 2006–2008.

## Synergistic Activities

Science outreach, STREAM Expo at St. John the Apostle School, Virginia Beach VA, May 8, 2018.

Science outreach, Big Blue Camp at Old Dominion University, Norfolk VA, June 26, 2017.

Science outreach, STREAM Expo at St. John the Apostle School, Virginia Beach VA, May 18, 2017.

Invited speaker, Graduate program in International Studies (IS-795/895),

Old Dominion University, Norfolk VA, October 29, 2014.

Speaker at Annual Colloquium for Scientific Vulgarization, Rimouski QC, 2006.

## Appendix: Presentations at professional meetings and published abstracts

- St-Laurent, P., and M.A.M. Friedrichs, Interannual Variability of Lateral Nitrogen and Carbon Fluxes along the Mid-Atlantic Bight, presentation at the 2018 Ocean Sciences Meeting, Portland OR, Feb.11-16, 2018.
- Da, F., M.A.M. Friedrichs and P. St-Laurent, Impacts of direct atmospheric deposition of nitrogen and continental shelf nitrogen fluxes on Chesapeake Bay hypoxia, presentation at the 2018 Ocean Sciences Meeting, Portland OR, Feb.11-16, 2018.
- Friedrichs, M.A.M., P. St-Laurent, D.E. Kaufman, F. Da, E.H. Shadwick, R.G. Najjar, Y. Yao and H. Tian, Changes in Chesapeake Bay Carbon Cycling over the Past Century, presentation at the 2018 Ocean Sciences Meeting, Portland OR, Feb.11-16, 2018.
- Najjar, R.G., M. Herrmann, R. Alexander, E.W. Boyer, D. Burdige, D.E. Butman, W.J. Cai, E.A. Canuel, R.F. Chen, M.A.M. Friedrichs, R.A. Feagin, P.C. Griffith, A. Hinson, J.R. Holmquist, X. Hu, W.M. Kemp, K.D. Kroeger, A. Mannino, S.L. McCallister, W.R. McGillis, M.R. Mulholland, C.H. Pilskalns, J. Salisbury, S.R. Signorini, P. St-Laurent, H. Tian, M. Tzortziou, P. Vlahos, A.Z. Wang and R.C. Zimmerman, Carbon Budget of Tidal Wetlands, Estuaries, and Shelf Waters of Eastern North America, presentation at the 2018 Ocean Sciences Meeting, Portland OR, Feb.11-16, 2018.
- Signorini, S.R., A. Mannino, M.A.M. Friedrichs, P. St-Laurent and J. Wilkin, Chesapeake Bay Export of Dissolved Organic Carbon from Space-borne Data, presentation at the 2018 Ocean Sciences Meeting, Portland OR, Feb.11-16, 2018.
- Dinniman, M.S., P. St-Laurent, K.R. Arrigo, E.E. Hofmann, J.M. Klinck, R.M. Sherrell, S.E. Stammerjohn and P.L. Yager, The ice shelf meltwater pump contribution to vertical exchange over the open shelf in the Amundsen Sea and elsewhere around Antarctica, presentation at the 2018 Ocean Sciences Meeting, Portland OR, Feb.11-16, 2018.
- Oliver, H., P. St-Laurent, R.M. Sherrell and P.L. Yager, What controls the massive phytoplankton bloom in the Amundsen Sea Polynya?, presentation at the 2018 Ocean Sciences Meeting, Portland OR, Feb.11-16, 2018.
- Sherrell, R.M., P.L. Yager, P. St-Laurent, M.S. Dinniman, S.E. Stammerjohn, M. Lagerstrom and K.M. Harazin, High iron in outflow waters from the Dotson Ice Shelf cavity, Amundsen Sea, West Antarctica: Is glacial meltwater really the source?, presentation at the 2018 Ocean Sciences Meeting, Portland OR, Feb.11-16, 2018.
- Schwans, E., B. Parizek, M. Morlighem, R.B. Alley, D. Pollard, R.T. Walker, P. Lin, P. St-Laurent, T. LaBirt and H. Seroussi, Simulating ice dynamics in the Amundsen Sea sector, presentation at the AGU Fall meeting, New Orleans LA, Dec. 11-15, 2017.
- Da, F., M.A.M. Friedrichs and P. St-Laurent, Impacts of direct atmospheric nitrogen deposition and coastal nitrogen fluxes on Chesapeake Bay hypoxia, presentation at the CERF meeting, Providence RI, Nov. 5–9, 2017.
- St-Laurent, P., M.A.M. Friedrichs, E.H. Shadwick, F. Da, R.G. Najjar and H. Tian, Air-sea CO<sub>2</sub> flux variability in the Chesapeake Bay, presentation at the CERF meeting, Providence RI, Nov. 5–9, 2017.
- Yager, P.L., P. St-Laurent, R.M. Sherrell, M.S. Dinniman and S.E. Stammerjohn, ‘Meltwater pump’ mechanism directly links the extreme Amundsen Sea phytoplankton bloom to the melting ice shelf, presentation at the WAIS meeting, Coupeville WA, Oct. 8-11, 2017.
- Oliver, H., P. St-Laurent, R.M. Sherrell, P.L. Yager, Physical and biological controls on phytoplankton blooms in the Amundsen Sea Polynya, presentation at the International Goldschmidt Conference, Paris (France), August 13-18, 2017.
- Friedrichs, M.A.M., E.H. Shadwick, R.G. Najjar, P. St-Laurent, F. Da and H. Tian, Air-sea CO<sub>2</sub> variability in the Chesapeake Bay, poster presentation at the OCB summer workshop, Woods Hole MA, June 26-29, 2017.
- St-Laurent, P. and M.S. Dinniman, Ice shelf melt-driven circulation of the deep layers in the Amundsen Sea, Antarctica, poster presentation at the 31st Forum for Research into Ice Shelf Processes (FRISP) workshop, Bergen (Norway), June 19-22, 2017.
- Da, F., M.A.M. Friedrichs and P. St-Laurent, Impacts of direct atmospheric deposition of nitrogen on Chesapeake Bay oxygen and nitrogen cycling, poster presentation at the Gordon Research Conference on Coastal Ocean Dynamics, Biddeford ME, June 11-16, 2017.
- Signorini, S.R., A. Mannino, M.A.M. Friedrichs, P. St-Laurent and J. Wilkin, Chesapeake Bay export of dissolved organic carbon from space-borne data, poster presentation at the International Ocean Colour Science (IOCS)-OCRT meeting, Lisbon (Portugal), May 15-18, 2017.
- Dinniman, M.S., P. St-Laurent, E. Hofmann, J.M. Klinck, S. Mack, How the cryosphere may affect iron supply to Antarctic phytoplankton blooms, oral presentation at The Southern Ocean Workshop: Its dynamics, biogeochemistry and role in the climate system, Boulder CO, April 10-13, 2017.

Oliver, H., P. St-Laurent, R.M. Sherrell and P.L. Yager, What makes a bloom in the Amundsen Sea Polynya? A 1-D biogeochemical modeling perspective, Gordon Research Conference on Polar Marine Science, Ventura CA, March 26-31, 2017.

Friedrichs, M.A.M. and P. St-Laurent, Fluxes of carbon and nutrients from upstream landscapes to the coastal ocean, NACP/AmeriFlux Meeting, North Bethesda MD, March 27-30, 2017.

Bernhardt, P.W., M.R. Mulholland, B. Widner, C. Sookhdeo, P. Sedwick, P. St-Laurent, M. Friedrichs, R.G. Najjar, The effect of atmospheric nitrogen deposition on primary productivity and nitrogen uptake along oligotrophic waters of the eastern United States, ASLO Meeting, Honolulu HI, February 26 to March 3, 2017.

St-Laurent, P., M.S. Dinniman, E.E. Hofmann, R.M. Sherrell, S.E. Stammerjohn and P.L. Yager. Variability of physical parameters influencing the bloom of the most productive Antarctic coastal polynya (Amundsen Sea Polynya), 2016 WAIS workshop, Sterling VA, Oct. 3-6, 2016.

Yager, P.L., P. St-Laurent, R.M. Sherrell, H. Oliver, M.S. Dinniman, S.E. Stammerjohn. Melting ice enhances coastal biological productivity, 2016 WAIS workshop, Sterling VA, Oct. 3-6, 2016.

Da, F., M.A.M. Friedrichs, and P. St-Laurent. Impacts of direct atmospheric deposition of nitrogen on Chesapeake Bay hypoxia, ChesMS16, Williamsburg VA, June 1-2, 2016.

St-Laurent, P., M.S. Dinniman, E.E. Hofmann, R. Sherrell, S. Stammerjohn, P. Yager, E. Randall-Goodwin. Transport pathways of nutrients in the Amundsen Sea, Antarctica. AGU-ASLO-TOS Ocean Sciences Meeting, New Orleans LA, February 2016.

Najjar, R.G., P. Sedwick, M. Mulholland, M.A.M. Friedrichs, A. Thompson, D. Martins, P. Bernhardt, M. Herrmann, L. Price, B. Sohst, C. Sookhdeo, P. St-Laurent, B. Widner. Deposition of atmospheric nitrogen to coastal ecosystems (DANCE): A study in seasonally oligotrophic waters off the eastern U.S. AGU-ASLO-TOS Ocean Sciences Meeting, New Orleans LA, February 2016.

Mu, L., P. Yager, P. St-Laurent, M. Dinniman, E. Hofmann, H. Oliver, R. Sherrell, S. Stammerjohn. Investigating the role of mesoscale processes and ice dynamics in carbon and iron fluxes in a changing Amundsen Sea (INSPIRE). AGU-ASLO-TOS Ocean Sciences Meeting, New Orleans LA, February 2016.

St-Laurent, P., M.A.M. Friedrichs, R.G. Najjar, M. Herrmann, 2015. Comparing the impact of atmospheric nitrogen deposition and wind mixing on biological productivity during storm events. Ocean Carbon and Biogeochemistry workshop, Woods Hole, MA, July 2015.

St-Laurent, P., J.M. Klinck, M.S. Dinniman. Dispersion of glacial meltwater by eddies in the Amundsen Sea. AGU-ASLO-TOS Ocean Sciences Meeting, Honolulu HI, February 2014.

St-Laurent, P., J.M. Klinck, M.S. Dinniman. What determines the differences in basal melt between ice shelves in the Amundsen Sea? West Antarctic Ice Sheet (WAIS) workshop, Sterling VA, Sept. 28 to Oct. 2, 2013.

St-Laurent, P., J.M. Klinck, M.S. Dinniman. What determines the differences in basal melt between ice shelves in the Amundsen Sea? Forum for Research in Ice Shelves Processes (FRISP), Powys, Wales, June 17-19, 2013.

St-Laurent, P., J.M. Klinck, M.S. Dinniman, Stable vs. unstable slope currents and cross-shelf exchanges in coastal troughs. Gordon Research Conference on Coastal Ocean Circulation, Biddeford ME, June 9-14, 2013.

St-Laurent, P., J.M. Klinck, M.S. Dinniman. Influence of ocean circulation patterns on ocean heat transport to ice shelves. West Antarctic Ice Sheet (WAIS) workshop, Eatonville WA, September 20-22, 2012.

St-Laurent, P., J.M. Klinck, M.S. Dinniman. Comparing the oceanic heat transport to Antarctic ice shelves for two generic continental shelves. 26th Forum for Research into Ice Shelf Processes (FRISP), Utö Vårdshus, Sweden, June 12-14, 2012.

St-Laurent, P., J.M. Klinck, M.S. Dinniman. Cross-shelf exchanges in Antarctica in the presence of troughs. 2012 International Polar Year (IPY) conference, Montréal Québec, April 23-27, 2012.

St-Laurent, P., J.M. Klinck, M.S. Dinniman. Cross-shelf exchanges induced by troughs. AGU-ASLO-TOS Ocean Sciences Meeting, Salt Lake City UT, February 2012.

Dinniman, M.S., P. St-Laurent, J.M. Klinck, 2011. What controls the time scale of Circumpolar Deep Water intrusions onto Antarctic continental shelves? Oral presentation at the 25th IUGG General Assembly, Melbourne, Australia, June 28 to July 7, 2011.

St-Laurent, P., J.M. Klinck, M.S. Dinniman. On the role of coastal troughs in the transport of heat to ice shelves. 2011 Gordon Research Conference on Coastal Ocean Modeling, Mount Holyoke College MA, June 26-30, 2011.

St-Laurent, P., J.M. Klinck, M.S. Dinniman. On the role of coastal troughs in the transport of ocean heat to ice shelves. IGS-FRISP Meeting, La Jolla CA, June 6-10, 2011.

St-Laurent, P., J.M. Klinck, M.S Dinniman. Idealized experiments of warm Circumpolar Deep Water intruding over the continental shelf. West Antarctic Ice Shelf (WAIS) workshop, Lake Raystown PA, September 22-25, 2010.

St-Laurent, P., F. Straneo, J.-F. Dumais, D.G. Barber. Storage and release of freshwater in a subarctic basin : The case of Hudson Bay. AGU-ASLO-TOS Ocean Sciences Meeting, Portland OR, Feb. 2010.

St-Laurent, P., F. Straneo, J.-F. Dumais, D.G. Barber. What is the Fate of the Riverine Freshwater of Hudson Bay? Sixth ArcticNet Annual Scientific Meeting, Victoria BC, Canada, Dec. 2009.

St-Laurent, P., F. Straneo, J.-F. Dumais, D.G. Barber. What is the Fate of the Riverine Freshwater of Hudson Bay? Gordon Research Conference on Coastal Ocean Circulation, New-London NH, 2009.

St-Laurent, P., M. Defossez, F.J. Saucier, F. Straneo, S. Senneville, J.-F. Dumais. New observations and numerical simulations of the sea ice-ocean seasonal cycle in Hudson Bay, Foxe Basin and Hudson Strait, Canada. AGU-ASLO-TOS Ocean Sciences Meeting, Honolulu HI, Feb. 2006.