

# WILLIAM J. BURT

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Citizenship: Canadian & UK

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## SUMMARY OF QUALIFICATIONS:

- PhD in Chemical Oceanography from Dalhousie University
- BSc in Geoscience, with Ocean Sciences minor from the University of Victoria
- 12 peer reviewed publications (6 as first-author)
- Several major academic and service awards, including a NSERC Postdoctoral Fellowship, Killam Predoctoral Scholarship, travel/exchange awards, Dalhousie President's Award and Dalhousie IMPACT award for Leadership in Recreation
- Over 40 weeks of sea-going research experience
- Significant teaching experience (8 semesters), and mentoring and ocean science outreach activities, including Let's Talk Science and Science Venture
- Extensive professional development and leadership activities, including Mitacs Professional Development workshops, Student Buddy programs, and Oceanography Student Society President

## EDUCATION:

### Doctor of Philosophy

Sept 2009 - May 2015

School of Oceanography

Dalhousie University, NS

**Thesis advisor, Dr. Helmuth Thomas**

Transfer from MSc program in Sept. 2012

### Bachelor of Science with distinction

Sept 2003 - May 2008

School of Earth & Ocean Sciences

University of Victoria, BC

Major: Geoscience Minor: Oceanography

## SCHOLARSHIPS AND AWARDS:

### Major Awards:

- NSERC Postdoctoral Fellowship (\$45,000) 2016
- Killam Scholarship Renewal (\$25,000) 2014
- Level 2 Killam Predoctoral Scholarship Recipient (\$25,000) 2013  
Source: Isaak Walton Killam Memorial Fund for Advanced Studies
- Dalhousie Presidents Award (\$8264) 2013
- NSERC Undergraduate Student Research Award (USRA) (\$13,358) 2008

## Other Awards:

- University of British Columbia 3-Minute Thesis Postdoc Slam Winner (\$100) 2017
- Nomination for Faculty of Science's Best PhD Thesis in spring convocation 2015
- Dalhousie 3-Minute thesis finalist 2015
- Dissertations Symposium in Chemical Oceanography (DISCO) Invitation 2014  
Source: U.S. National Science Foundation
- POME Student Mentorship Proposal Funded 2014  
Source: Dalhousie/University of Bergen POME exchange fund
- CMOS Prize for Best Overall Talk - Dal Oceans C-DOGS Conference (\$250) 2014  
Source: Canadian Meteorological and Oceanographic Society
- Dalhousie University/University of Bergen Exchange Program award (\$12000) 2013  
Source: Prediction and Observation of the Marine Environment (POME) fund
- Keith Runcorn Travel Award for European Geosciences Union meeting (€250) 2013  
Source: European Geosciences Union (EGU)
- Dalhousie Oceanography C-DOGS Conference 'Best PhD Talk' (\$200) 2013  
Source: Dalhousie Department of Oceanography
- Dalhousie IMPACT Award for Leadership in Recreation 2012
- Kathy Ellis Memorial Book Prize (top GPA among incoming grad students) (\$200) 2010  
Source: Dalhousie Department of Oceanography
- Dalhousie Graduate Student Research Stipend 2009
- University of Victoria Undergraduate Student Alumni Scholarship 2007

## PROFESSIONAL EXPERIENCE:

**NSERC Award Interruption for Parental leave** Nov 2017 to May 2018

- A 6-month paid leave to act as primary caregiver for my infant son while my partner enrolls as a part-time student

**NSERC Postdoctoral Fellow** May 2016 to Nov 2017

University of British Columbia

*SUPERVISOR:* Dr. Philippe Tortell

- Oversight of international collaborative project monitoring the strength of the biological pump in the Subarctic Pacific
- Conducting high-frequency optical measurements of primary productivity, as well as measurements of vertical carbon export using radiotracer techniques

**Postdoctoral Investigator** May 2015-Jan 2016

Dalhousie University

*SUPERVISOR:* Dr. Helmuth Thomas

- Data collection and analysis for high-resolution autonomous CO<sub>2</sub> sensor
- Investigation of rockweed (*Ascophyllum nodosum*) as an indicator of ocean acidification

**Visiting Student** Aug-Dec 2013

University of Bergen

- Continuation of PhD research in collaboration with European colleagues

**Research Assistant** Jan-Apr 2008

School of Earth & Ocean Sciences

University of Victoria

*SUPERVISOR*: Dr. Kevin Telmer

- Conducted carbon analysis research in geochemistry lab
- Data analysis and quality control

## **TEACHING EXPERIENCE:**

**Instructor (EOSC373: Intro Oceanography: Climate and Ecosystems)** Spring 2017

University of British Columbia: Department of Earth Ocean and Atmospheric Sciences

*SUPERVISOR*: Maite Maldonado & Roger Francois

- Lectured, developed new course material and exam questions

**Teaching Assistant (OCEA 2000/2002: Blue Planet)**

Fall 2012-Spring 2014

Dalhousie Oceanography Department

*SUPERVISOR*: Paul Hill & Laura Degelleke

- Filled in as lecturer, developed exam questions, delivered current-events mini-lectures

**Teaching Assistant (GEOG 1030: Physical Geography)**

Fall 2009-Spring 2011

Dalhousie Earth Sciences Department

*SUPERVISOR*: Martin Gibling (Fall) and Charlie Wells (Spring)

- Conducted tutorial lectures, provided help outside class time, marked assignments

**Volunteer, Let's Talk Science Outreach Program**

Fall 2010

*Science with Impact® Workshop Attendee*

Let's Talk Science Dalhousie

- Development and instruction of Oceanography-based lectures and hands-on lab activities in local Elementary School.

**Teaching Assistant**

Summer 2006

University of Victoria

Science Venture

*SUPERVISOR*: Roberta MacDonald

- Instruction of educational science summer camps (ages 7-15)

## **SEA-GOING EXPERIENCE:**

**CCGS John P. Tully (Halifax, Canada)**

Duration: 16 days, Line P Sampling Program

February 2017

Duration: 10 days, La Perouse Sampling Program

May 2016

-Operation of underway optical system, assisted in water sampling

**R/V Oceanus (Seward, Alaska, USA)**

Duration: 20 days, Primary Productivity and Trace Gases Cruise

July 2016

-Operation of underway optical system, assisted in water sampling

**CCGS Henry Hudson (Halifax, Canada)**

Duration: 10 Days, Atlantic Zone Monitoring Program Cruise April 2015  
Duration: 10 Days, Atlantic Zone Monitoring Program Cruise October 2012  
Duration: 10 Days, Atlantic Zone Monitoring Program Cruise April 2011  
Duration: 21 Days, Atlantic Zone Monitoring Program Cruise April 2010  
Duration: 10 Days, Atlantic Zone Monitoring Program Cruise October 2009  
Duration: 21 Days, Atlantic Zone Monitoring Program Cruise April 2009  
-Collection of water samples for onboard analysis of DIC, TA and Radium

**R/V Pelagia (Texel, Netherlands)**

Duration: 21 days, NIOZ North Sea Monitoring September 2011  
-Assistant CTD operator, collected Radium isotopes for onboard analysis

**CCGS Sigma T (Halifax, Canada)**

Duration: daily trips Sept 2010-Jan 2011  
-Collected water samples at Station HL2, Halifax Harbour, and Bedford Basin

**CCGS Louis S. St-Laurent**

Duration: 54 days, Joint Ocean Ice Study July-Aug 2008  
Duration: 34 days, Joint Ocean Ice Study Aug 2005  
-Science Team Watch Leader, supervised deck activities, water sample collection

**CCGS Sir Wilfrid Laurier**

Duration: 21 days, Leg 1: North Pacific/Bering Sea/Chuckchi Sea July 2007  
-Assisted in water sample collection, operation of bottom camera

**SUMMARY OF ANALYTICAL SKILLS:**

- Computer skills (Microsoft Office, LaTeX, Ocean Data View, MATLAB)
- Basic Offshore Safety Induction & Emergency Response Training Certificate
- Analytical techniques for various chemical parameters including:
  1. VINDTA analysis for DIC/Alkalinity
  2. Winkler titration for Oxygen Analysis
  3. RaDeCC instrument and Beta-counter for Radium and Thorium isotope counting
  4. Underway pCO<sub>2</sub> air/water system
  5. Phytoplankton biomass and productivity (optical and trace-gas techniques)

**EXTRACURRICULAR ACTIVITIES:**

**Co-developer, Dalhousie Graduate Students and Researchers** July 2014

**Examining Atlantic Ocean Trajectories (GREAT) Retreat**

- Led the development and organization, including budget and itinerary, of 2-day retreat, bringing together 30 graduate students in ocean-related fields.
- Led to creation of several interdisciplinary research projects for future consideration at Dalhousie

**Co-organizer, Annual Conference of Dalhousie Oceanography** April 2014

### **Graduate Students (CDOGS)**

- Compilation of abstracts, conference scheduling, session chairing and general logistical organization of the 1-day conference

### **President, Dalhousie Oceanography Students Association** Sept 2010-May 2013

- Chairing monthly student meetings
- Responsible for organizing student/faculty social and sports events
- Primary contact for new student orientation, and student recruitment

### **Graduate Student Representative, Dalhousie Fitness and Recreation Planning and Management Committee** Sept 2012-Jan 2013

- Participation in monthly meetings in preparation for new fitness facility
- Conducting student surveys on recommendations for pending facility

### **Volunteer, Dalhousie International Student Buddy Program** Sept 2012-Jan 2013

- Orientation and mentoring for two incoming international graduate students

### **Plenary Speaker, Ocean Networks Canada Symposium** April 2012

- Presentation (via webinar) about research topics in the Dalhousie Oceanography department to an audience of high school and graduate students at the University of Victoria.

### **Exhibitor for Dalhousie Oceanography at American Geophysical Union (AGU) meeting in San Francisco** December 2011

- Provide information to potential students and employees during week-long conference

## **PEER-REVIEWED PUBLICATIONS:**

Zeng, C., S. Rosengard, **W. J. Burt**, A. Pena, N. Nemcek, T. Zeng, K. Arrigo, and P. D. Tortell (2018). Optically-derived estimates of phytoplankton size class and taxonomic group biomass in the Eastern Subarctic Pacific Ocean. Deep-Sea Research Part I. Oceanographic Research Papers, 136, <http://doi.org/10.1016/j.dsr.2018.04.001>.

-Assisted with data collection and processing, as well as with manuscript preparation.

Lemay, J., H. Thomas, S. E. Craig, **W. J. Burt**, K. Fennel, and B. J. W. Greenan (2018). Hurricane Arthur and its effect on the short-term variability of pCO<sub>2</sub> on the Scotian Shelf, NW Atlantic. Biogeosciences, 15, 2111-2123, <http://doi.org/10.5194/bg-15-2111-2018>.

-Mentor for lead author J. H. Lemay, assisted with manuscript preparation and editing

**Burt, W. J.**, T. K. Westberry, M. J. Behrenfeld, C. Zeng, R. W. Izett, and P. D. Tortell, (2018). Carbon : Chlorophyll ratios and net primary productivity of Subarctic Pacific surface waters derived from autonomous shipboard sensors. Global Biogeochemical Cycles, 32. <http://doi.org/10.1002/2017GB005783>.

-This is the first published work from my UBC postdoctoral studies. It provides high-resolution shipboard estimates of phytoplankton biomass, physiological status, and productivity across the Subarctic Pacific.

**Burt, W. J.,** H. Thomas, L. A. Miller, M. A. Granskog, T. N. Papakyriakou, and L. Pengelly (2016). Inorganic Carbon Cycling and Biogeochemical Processes in an Arctic Inland Sea (Hudson Bay). *Biogeosciences*, doi:10.5194/bg-13-4659-2016.

-This paper discusses the impact of freshwater, biological activity, and circulation patterns on the inorganic carbon cycle of the Hudson Bay

Turk, D., J. M. Bedard, **W. J. Burt,** S. Vagle, H. Thomas, K. Azetsu-Scott, W. R. McGillis, S. J. Iverson, D. W. R. Wallace (2016). Inorganic carbon in a high latitude estuary-fjord system in Canada's eastern Arctic. *Est. Coast. Shelf. Sci.*, doi:10.1016/j.ecss.2016.06.006.

-Assisted in data analysis, as well as manuscript preparation and editing.

**Burt, W. J.,** H. Thomas, M. Hagens, J. Pätsch, N. M. Clargo, L. A. Salt, V. Winde, and M. E. Böttcher (2016). Carbon sources in the North Sea evaluated by means of radium and stable carbon isotope tracers. *Limnol. Oceanogr.* doi:10.1002/lno.10243.

-This paper describes a multi-tracer approach to following additions and transformations of carbon and nutrients through the North Sea.

Craig, S. E., H. Thomas, C. T. Jones, W. K. Li, B. J. Greenan, E. H. Shadwick, **W. J. Burt** (2015). The effect of seasonality in phytoplankton community composition on CO<sub>2</sub> uptake on the Scotian Shelf. *J. Mar. Sys.* doi:10.1016/j.marsys.2014.07.006.

-Assisted in manuscript preparation and editing, as well as analysis of buoy data

**Burt, W. J.,** H. Thomas, J. Pätsch, A. M. Omar, C. Schrum, U. Daewel, H. Brenner, H. J. W. de Baar (2014). Radium isotopes as a tracer of sediment-water column exchange in the North Sea. *Glob. Biogeochem. Cycles*, 28, doi:10.1002/2014GB004825.

-GBC is a leading journal in our field. The paper also represents a collaborative effort with numerous colleagues met during my exchange in Europe in 2013.

Jiang, Z.-P., D. J. Hydes, M. C. Hartman, S. E. Hartman, J. M. Campbell, B. D. Johnson, B. Schofield, D. Turk, D. Wallace, **W. J. Burt,** H. Thomas, C. Cosca, and R. Feely (2014). Application and assessment of the membrane-based CO<sub>2</sub> sensor under field and laboratory conditions. *Limn. Oceanogr.: Methods*, doi:10.4319/lom.2014.12.264.

-Conducted extensive laboratory calibration of the CO<sub>2</sub> sensor

**Burt, W. J.,** H. Thomas, and J.-P. Auclair (2013). Short-lived radium isotopes on the Scotian Shelf: Unique distributions and tracers of cross-shelf CO<sub>2</sub> and nutrient transport, *Mar. Chem.*, <http://dx.doi.org/10.1016/j.marchem.2013.05.007>.

-This paper is highlighted by an observation-modeling comparison facilitated by collaboration with a fellow PhD student in Dalhousie Oceanography

**Burt, W. J.,** H. Thomas, K. Fennel, and E. Horne (2013). Sediment-water column fluxes of carbon, oxygen and nutrients in Bedford Basin, Nova Scotia, inferred from <sup>224</sup>Ra measurements. *Biogeosciences*, 10, 53-66, doi:10.5194/bg-10-53-2013.

-This paper includes the first time-series measurements of benthic carbon and nutrient fluxes in the long-studied Bedford Basin, and was done in collaboration with colleagues at the Department of Fisheries and Oceans.

H. Thomas, H., S. Craig, B. Greenan, **W. Burt**, G. Herndl, S. Higginson, L. Salt, E. H. Shadwick, and J. Urrego Blanco (2012). Direct observations of diel biological CO<sub>2</sub> fixation on the Scotian Shelf, northwestern Atlantic Ocean. *Biogeosciences*, 9, 2301-2309.

-Assisted in statistical analysis of buoy data, as well as manuscript preparation

## **MANUSCRIPTS IN-REVIEW:**

**Burt, W. J.**, and P. D. Tortell (In Review). Observations of Zooplankton Diel Vertical Migration from High-Resolution Surface Ocean Optical Measurements. *Geophysical Research Letters*. Manuscript number: 2018GL079339.

Horwitz, R. M., A. E. Hay, **W. J. Burt**, R. Cheel, J. Salisbury, and H. Thomas (In Review). High-frequency variability of CO<sub>2</sub> in Grand Passage, Bay of Fundy, Nova Scotia. *Nature Geoscience*. Manuscript number: NGS-2018-05-01202.

-Planning and implementation of the timeseries measurements, initial data processing, and assistance in manuscript editing.

Miller, L. A., T. Burgers, **W. J. Burt**, M. A. Granskog, and T. Papakyriakou (In Review). Air-Sea CO<sub>2</sub> Flux Estimates in Stratified Arctic Coastal Waters: How Wrong Can We Be? *Geophysical Research Letters*. Manuscript number: 2017GL076627.

-Provided supplemental dataset, assisted in data quality control and manuscript editing.

## **OTHER PUBLICATIONS:**

**Burt, W.** The Radium Stopwatch: Using decaying isotopes to understand marine inputs of a key greenhouse gas. *Current Tides: Dalhousie Oceanography Research Magazine*, Vol. 1, Editor: Franziska Broell. *Dalhousie Oceanography*, pp. 32-35, 2013. <http://currenttides.ocean.dal.ca/>

-This article is part of the inaugural Dalhousie Oceanography Research Magazine. This was a volunteer outreach project designed to inform the public about our work at Dalhousie, while providing authors with experience writing articles for a public audience.

## **PRESENTATIONS:**

2018: Ocean Sciences Meeting, Portland, Oregon, USA

2017: Seminar speaker, Bedford Institute of Oceanography, Halifax, Canada (**invited**)

Departmental Seminar, Mt. Allison University, Sackville, Canada (**invited**)

Departmental Seminar, Dalhousie University, Halifax, Canada (**invited**)

2016: Ocean Optics XXIII, Victoria, Canada

Station Papa 60<sup>th</sup> Anniversary Symposium, Victoria, Canada

2015: ArcticNet Conference, Vancouver, Canada

Departmental Seminar: Dalhousie Oceanography

3-minute thesis competition (2013-2015)

2014: Killam Celebration, Dalhousie University

Goldschmidt Conference (2 oral presentations), Sacramento, USA

2013: GFI Seminar Series, Bergen, Norway (**invited**)  
AWI Seminar Series, Bremerhaven, Germany (**invited**)  
Institute of Oceanography Seminar, University of Hamburg, Germany (**invited**)  
POME International Workshop, Bergen, Norway (**invited**)  
EGU (oral & poster presentations), Vienna, Austria (**EGU travel award recipient**)  
2012: Goldschmidt Conference (poster), Montreal, Canada  
International Ra/Rn Workshop, Rhode Island, USA  
2009-2014: Conference for Dalhousie Oceanography Graduate Students

## **ABSTRACTS:**

**Burt, W. J.**, T. K. Westberry, M. J. Behrenfeld, C. Zeng, R. W. Izett, and P. D. Tortell. Carbon : Chlorophyll ratios and net primary productivity of Subarctic Pacific surface waters derived from autonomous shipboard sensors. Ocean Sciences Meeting, Portland, OR, February, 2018.

Thomas, H., **W. Burt**, M. Hagens, J. Pätsch, N. M. Clargo, L. Salt. Sediments, eutrophication and ocean acidification in the North Sea. International Carbon Dioxide Conference. Bern, Switzerland, August 2017.

**Burt, W. J.**, P. Tortell. Optical properties of Subarctic Pacific surface waters across contrasting hydrographic and productivity regimes (Poster Presentation). Ocean Optics XXIII, Victoria, Canada, October 2016.

**Burt, W. J.**, H. Thomas, M. Hagens, H. Brenner, J. Pätsch, N. M. Clargo, L. A. Salt. Regulation of CO<sub>2</sub> Air Sea Fluxes by Sediment in the North Sea. Geophysical Research Abstracts, vol.18, EGU2016-4722, April 2016.

**Burt, W. J.**, H. Thomas, L. A. Miller, M. A. Granskog, T. N. Papakyriakou, and L. Pengelly. Inorganic Carbon Cycling and Biogeochemical Processes in an Arctic Inland Sea (Hudson Bay). Geophysical Research Abstracts, vol.18, EGU2016-4684, April 2016.

**Burt, W. J.**, H. Thomas, L. A. Miller and T. N. Papakyriakou. Updated insights into the inorganic carbon cycling and biogeochemical processes of an Arctic inland sea (Hudson Bay). ArcticNet, Vancouver, BC, December 2015.

**Burt, W. J.**, H. Thomas, J. Pätsch, A. M. Omar, C. Schrum, U. Daewel, H. Brenner and H. J. W. de Baar. Radium isotopes as a tracer of sediment-water column exchange in the North Sea. Goldschmidt, Sacramento, USA, June 2014.

**Burt, W. J.**, H. Thomas, M. Hagens, H. Brenner, and J. Pätsch. Using carbon and radium isotopes to evaluate the biogeochemical impact of boundary exchanges in the North Sea. Goldschmidt, Sacramento, USA, June 2014.

**Burt, W.**, H. Thomas, and J. Pätsch. Investigating carbon sources to the North Sea using short-lived radium isotope distributions (Poster Presentation). Geophysical Research Abstracts, vol.15, EGU2013-5763, April 2013.



**Burt, W.,** H. Thomas. Short-lived radium isotopes on the Scotian Shelf: Unique distributions and tracers of cross-shelf CO<sub>2</sub> and nutrient transport. Geophysical Research Abstracts, vol. 15, EGU2013-449, April 2013.

Craig, S., H. Thomas, C. Jones, B. Greenan, W. Li, J. Sheng, E. Shadwick and **W. Burt** (2013). The effect of seasonality in phytoplankton community composition on carbon uptake on the Scotian Shelf, northwest Atlantic. Geophysical Research Abstracts, vol. 15, EGU2013-12528.

**Burt, W.,** H. Thomas, K. Fennel, J. N. Smith, and E. Horne. Pore-water diffusive fluxes of <sup>224</sup>Ra and CO<sub>2</sub> in Bedford Basin, Nova Scotia (Poster Presentation). Goldschmidt, Montreal, Canada, June 2012.

## **REFERENCES:**

Dr. Philippe Tortell – University of British Columbia

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Relationship: Postdoctoral Supervisor

Dr. Helmuth Thomas – Canada Research Chair, Dalhousie University

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Relationship: PhD Supervisor

Dr. John Smith - Bedford Institute of Oceanography

John.Smith@dfo-mpo.gc.ca

Phone: 1-902-426-3865

Relationship: Research Collaborator