

# Hansen Dalmasse Johnson

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## Education

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- May 2015 to Present     **Dalhousie University**, PhD<sup>1</sup> candidate in Biological Oceanography  
**Woods Hole Oceanographic Institution**, Guest student in Biology  
*Advisers: Christopher Taggart (Dal) and Mark Baumgartner (WHOI)*  
Anticipated graduation: May 2021  
<sup>1</sup>transferred from the MSc program in September 2016
- Aug 2009 to Jun 2013     **Bates College**, BSc in Biology with minor in Music  
Thesis Title: “Diversity and characterization of songs in the Bering-Chukchi-Beaufort population of bowhead whales (*Balaena mysticetus*) during their annual spring migration, 2011”  
*Advisers: Will Ambrose (Bates College) and Kate Stafford (University of Washington)*
- Aug 2011 to Dec 2011     **Marine Biological Laboratory**, Semester in Environmental Science  
Project Title: “Resource limitation affects productivity and heterocyst formation in nitrogen fixing cyanobacteria”  
*Advisers: Zoe Cardon and Ed Rastetter*

## Research Experience

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- Apr - June 2014     **Research Assistant**, Biology Department, Woods Hole Oceanographic Institution.  
Assisted with analysis of autonomous real-time marine mammal detections  
*Adviser: Mark Baumgartner*
- Jul 2013 - Aug 2014     **Fulbright Research Fellow**, Norwegian University of Science and Technology.  
Designed and implemented a study of the effect of cold on the photosynthetic ability of a suite of conifer species  
*Adviser: Richard Strimbeck*
- Apr - Sep 2013     **Research Assistant**, University of Washington Applied Physics Laboratory.  
Analyzed acoustic data from the Fram Strait to identify and compare bowhead whale vocalizations  
*Adviser: Kate Stafford*

- May - Sep 2013      **Research Assistant**, Marine Biological Laboratory and Toolik Field Station.  
Set up and maintained eddy covariance towers and conducted carbon content analysis of tundra specimens to evaluate the effects of fire on tundra ecology  
*Adviser: Adrian Rocha*
- Apr - May 2012      **Research Assistant**, Bates College Environmental Geochemistry Laboratory.  
Developed and wrote acid-digestion methods for conducting stable isotope analysis on bivalve shell samples  
*Advisers: Will Ambrose and Beverly Johnson*
- Apr - June 2011      **Marine Mammal Observer**, North Slope Borough Department of Wildlife.  
Documented the presence and behavior of bowhead whales from a sea ice observation post on the Chukchi Sea in the Alaskan arctic  
*Chief Scientist: Craig George*

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## Academic Honors

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- 2013      **Drake R. Bradley Award**. Given to the senior with the most promising research thesis. Bates College
- 2013      **Magna Cum Laude** (GPA: 3.88/4.0). Bates College
- 2013      **Sigma Xi Scientific Research Society**
- 2013      **Phi Beta Kappa Society**
- 2013      **Rankin Prize**. Given to the best undergraduate oral presentation. New England Estuarine Research Society (NEERS)
- 2009-13      **Dean's Honors List** (all semesters). Bates College
- 2011      **MBL Associates Award**. Given for excellence in independent research. Marine Biological Laboratory
- 2010      **Dana Scholar**. Given for academic excellence and promise, leadership potential, and service to the college and the community. Bates College

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## Scholarships / Fellowships

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***Current***

- 2017-20 Vanier Canada Graduate Scholarship  
2017-19 Killam Predoctoral Scholarship, Doctoral level  
2017-19 Dalhousie President's Award  
2016-20 NS Graduate Scholarship, Doctoral level

***Past***

- 2015-17 Killam Predoctoral Scholarship, Master's Level  
2015-17 NS Graduate Scholarship, Master's Level  
2015-16 FGS Master of Science Scholarship  
2013-14 Fulbright Fellowship Grantee to Norway.  
2011 NSF Research Experience for Undergraduates (REU) Grantee

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## Grants Awarded

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1. **Title:** "Measuring the acoustic detection range of large whales from an ocean glider to improve an acoustic whale alert system for use by the offshore marine industry in Atlantic Canada."  
**Agency:** Offshore Energy Research Association (OERA)  
**Principle Investigators:** HD Johnson, MF Baumgartner, CT Taggart  
**Amount:** \$20,000 CAD

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## Other Awards

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4. **Title of Award:** Michael Smith Foreign Study Supplement  
**Agency:** Natural Sciences and Engineering Research Council of Canada (NSERC)  
**Description:** Support for research at Woods Hole Oceanographic Institution (WHOI) in spring 2019.  
**Amount:** \$2000 CAD
3. **Title of Award:** MEOPeer Researcher Development, 2018  
**Agency:** Marine Environmental Prediction and Response Network (MEOPAR)  
**Description:** Support for participation in DCLDE workshop in Paris, France.  
**Amount:** \$2000 CAD
2. **Title of Award:** MEOPeer Researcher Development, 2017  
**Agency:** Marine Environmental Prediction and Response Network (MEOPAR)  
**Description:** Support for participation in Slocum Glider Pilot training in North Falmouth, MA, USA.  
**Amount:** \$2500 CAD
1. **Title of Award:** MEOPeer Researcher Development, 2015  
**Agency:** Marine Environmental Prediction and Response Network (MEOPAR)  
**Description:** Support for travel to and participation in workshops focused on passive acoustic density estimation of marine mammals in San Francisco, CA, USA.  
**Amount:** \$2100 CAD

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## Refereed Publications

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### *In Preparation:*

6. **Johnson HD**, Baumgartner MF, Davies KTA, Taggart CT. North Atlantic right whale foraging and habitat in the southern Gulf of St Lawrence.
5. **Johnson HD**, Baumgartner MF, Lin YT, Newhall A, Taggart CT. Probability of passive acoustic detection of right whales from autonomous platforms equipped with a real-time monitoring system.
4. **Johnson HD**, Baumgartner MF, Davies KTA, Fox C, Taggart CT. Using ocean gliders to evaluate the partitioning of a shallow coastal basin habitat by baleen whales in the Northwest Atlantic.

### *Accepted:*

3. Durette-Morin D, Davies KTA, Brown M, **Johnson HD**, Moors-Murphy H, Martin B, Taggart CT. Comparison of visual and acoustic monitoring of North Atlantic right whale and implications for future passive acoustic monitoring. *Marine Mammal Science* (*submitted 28 Aug 2017*)

### *Published:*

2. Pelabon C, Hennet L, Strimbeck R, **Johnson HD**, Armbruster WS (2015) Blossom colour change after pollination provides carbon for developing seeds. *Functional Ecology*. (Published online 10 Mar 2015)
1. **Johnson HD**, Stafford KM, George JC, Ambrose WG, Clark CW (2014) Song sharing and diversity in the Bering-Chukchi-Beaufort population of bowhead whales (*Balaena mysticetus*), spring 2011. *Marine Mammal Science*. (Published online 30 Dec 2014).

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## Conference Proceedings

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1. Davis R, Baumgartner M, Comeau A, Cunningham D, Davies K, Furlong A, **Johnson HD**, L'Orsa S, Ross T, Taggart C, Whoriskey F (2016) Tracking whales on the Scotian Shelf using passive acoustic monitoring on ocean gliders. In *OCEANS 2016 MTS/IEEE Monterey* (pp. 1-4). IEEE.

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## Non-refereed Publications

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1. **Johnson HD** (2014) The importance of sound for bowhead whales. *Science Nordic*. Available at <http://sciencenordic.com/importance-sound-bowhead-whales>

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## Presentations

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27. **Johnson HD\***, Baumgartner MF, Lin Y-T, Newhall A, Taggart CT. Probability of detecting right whales in near-real time from autonomous platforms. Oral presentation at: Defence Research and Development Canada Seminar Series. 22 Nov 2018, Dartmouth, NS Canada

26. **Johnson HD\***, Baumgartner MF, Lin Y-T, Newhall A, Taggart CT. Probability of detecting right whales from autonomous platforms equipped with a real-time monitoring system. Oral presentation at: North Atlantic Right Whale Consortium Meeting. 08 Nov 2018, New Bedford, MA USA
25. Davis G\*, Baumgartner MF, **Johnson HD**, Van Parijs S. Catching up with the times: creating accessible, updated NARW acoustic presence tools. Oral presentation at: North Atlantic Right Whale Consortium Meeting. 08 Nov 2018, New Bedford, MA USA
24. **Johnson HD\***, Baumgartner MF, Lin Y-T, Newhall A, Taggart CT. Probability of detecting right whales from autonomous platforms equipped with a real-time monitoring system. Oral presentation at: OERA webinar series. 25 Oct 2018
23. **Johnson HD\***, Baumgartner MF, Lin Y-T, Newhall A, Taggart CT. Characterizing the range-dependent accuracy of a near real-time baleen whale monitoring system. Oral presentation at: Canadian Meteorological and Oceanographic Society Congress. 10 Jun 2018, Halifax, NS Canada
22. **Johnson HD\***, Baumgartner MF, Lin Y-T, Newhall A, Taggart CT. Characterizing the range-dependent accuracy of a near real-time baleen whale monitoring system. Oral presentation at: Detection, Classification and Density Estimation (DCLDE) Workshop. 04 Jun 2018, Paris, France
21. **Johnson HD\***, Baumgartner MF, Lin Y-T, Newhall A, Taggart CT. Characterizing the range-dependent accuracy of a near real-time baleen whale monitoring system. Poster presentation at: Northeast Regional Environmental Acoustics Symposium. 20 Mar 2018, Durham NH, USA
20. **Johnson HD\***, Baumgartner MF, Lin Y-T, Newhall A, Taggart CT. Characterizing the range-dependent accuracy of a near real-time baleen whale monitoring system. Poster presentation at: Ocean Sciences Meeting. 12-16 Feb 2018, Portland OR, USA
19. **Johnson HD\***. Glider-based PAM: a (brief) overview. Invited speaker at the workshop: Passive Acoustic Monitoring (PAM) of Marine Mammals. 28-29 Oct 2017, Halifax NS, Canada
18. Durette-Morin D\*, Davies KTA, Moors-Murphy H, Baumgartner MF, **Johnson HD**, Brown MW, Martin B, Taggart CT. North Atlantic right whale acoustic and visual monitoring in a Canadian critical habitat: implications for future monitoring. Society of Marine Mammology Biennial Conference, 26 Oct 2017, Halifax NS, Canada
17. **Johnson HD\***, Baumgartner MF, Taggart CT. Using Ocean Gliders to Evaluate the Partitioning of a Shallow Coastal Basin Habitat by Baleen Whales in the Northwest Atlantic. Society of Marine Mammology Biennial Conference, 26 Oct 2017, Halifax NS, Canada
16. Davies KTA\*, Baumgartner MF\*, Durette-Morin D, Gurnee J, **Johnson HD**, Taggart CT, van Parijs S. Current efforts to mitigate ship strikes using real-time acoustic monitoring from autonomous platforms. North Atlantic Right Whale Consortium, 22 Oct 2017, Halifax NS, Canada
15. **Johnson HD\***, Davies KTA, Baumgartner MF, Taggart CT. Right whale acoustic presence and habitat in Atlantic Canada using ocean gliders. North Atlantic Right Whale Consortium, 02 Nov 2016, New Bedford MA, USA

14. Durette-Morin D, Davies KTA, **Johnson HD**, Brown M, Moors-Murphy H, Taggart CT. Temporal Variation in Right Whale (*Eubalaena glacialis*) Population Indices and Vocalizations Measured Concurrently in Roseway Basin. North Atlantic Right Whale Consortium, 02 Nov 2016, New Bedford MA, USA
13. **Johnson HD\***, Davies KTA, Baumgartner MF, Taggart CT. Variation in baleen whale distribution and habitat on the Scotian Shelf. Conference of Dalhousie Oceanography Graduate Students (CDOGS), 18 Mar 2016, Halifax NS
12. **Johnson HD\***. Variation in baleen whale distribution and habitat on the Scotian Shelf. Participant in Three Minute Thesis competition, 11 Mar 2016, Halifax NS
11. **Johnson HD\***. MEOPAR-WHaLE: Using an app to reduce risk to whales. Invited seminar at: MEOPEER Training Meeting, 4 Feb 2016, Banff AB
10. Durette-Morin D\*, Davies KTA, **Johnson HD**. Is what we see what we hear? Temporal variation in right whale population indices and vocalizations measured concurrently in Roseway Basin. Poster presentation at: Cameron Conference, 9 Jan 2016, Halifax NS
9. Moors-Murphy HB\*, Martin B, Lawson J, Taggart CT, and **Johnson HD**. A Large-Scale Network of Bottom-Mounted Autonomous Acoustic Recorders is Providing New Data to Assess Cetacean Occurrence, and Understand Their Acoustic Environment, off Eastern Canada. Oral presentation at: North Atlantic Right Whale Consortium, 5 Nov 2015. New Bedford MA
8. **Johnson HD\***, Baumgartner MF, Davies KTA, Taggart CT. Real-time reporting of baleen whale vocalizations: a new tool for conservation. Oral presentation at: Sustainable Oceans Conference, 02 Oct 2015, Halifax NS
7. **Johnson HD\***, Baumgartner MF, Davies KTA, Taggart CT. Real-time monitoring of baleen whale distribution and habitat on the Scotian Shelf. Poster presentation at: Ocean Technology Council of Nova Scotia Student Networking Event. 10 Jun 2015, Halifax NS
6. **Johnson HD\***. Whales, Habitat and Listening (WHaLE) Project. Participant in Three Minute Thesis competition, 09 Apr 2015, Halifax NS
5. **Johnson HD\***, Stafford KM, George JC, Ambrose WG, Clark CW. Song sharing and diversity in the Bering-Chukchi-Beaufort population of bowhead whales (*Balaena mysticetus*), spring 2011. Poster presentation at: Watkins Memorial Marine Mammal Bioacoustics Symposium, 27 Mar 2015, New Bedford MA
4. **Johnson HD\***, Strimbeck GR. Wintertime photosynthesis in conifers. Oral presentation at: Norwegian Fulbright Seminar, Feb 2014 Oslo, Norway
3. **Johnson HD\***, Ambrose WG, Johnson BJ, Beal BF. Using stable isotopes to determine feeding preferences of the Wrymouth (*Cryptacanthodes maculatus*) in soft-sediment systems of coastal Maine. Award-winning oral presentation at: New England Estuarine Research Society Spring Meeting, Apr 2013, Plymouth MA
2. **Johnson HD\***, Rocha AV. Using reflectance to monitor the recovery of tundra vegetation following wildfire. Oral presentation at: Research for Undergraduates Symposium, Aug 2012, Toolik Field Station, AK

1. **Johnson HD\***, Cardon ZG, Rastetter EB. Resource limitation affects productivity and heterocyst formation in nitrogen-fixing cyanobacteria. Award-winning oral presentation at: Semester in Environmental Science Symposium, Dec 2011 Woods Hole MA

\*Presenter

## Academic Involvement

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|--------------|-----------------------------------------------------------------------------------------------------|
| 2017         | Member of the Student Affairs Committee for the Society of Marine Mammology                         |
| 2015-Present | Student Member of the Society of Marine Mammology                                                   |
| 2016-Present | Co-organizer of Methods in Ten Minutes (MTM) seminar series at Dalhousie University                 |
| 2015-2016    | Vice president of the Department of Oceanography Student Association (DOSA) at Dalhousie University |

## Teaching

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### Students

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|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2015-2016 | <b>Delphine Durette-Morin.</b> Co-adviser on BSc Honours project entitled: “Is what we see what we hear? Temporal variation in right whale population indices and vocalizations measured concurrently in Roseway Basin.” |
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### Instruction

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|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fall 2018   | Developed and taught a series of programming tutorials in R and Python with Christoph Renkl. Course website: <a href="https://christophrenkl.github.io/programming_tutorials/">https://christophrenkl.github.io/programming_tutorials/</a> |
| Winter 2017 | Teaching Assistant for Fisheries Oceanography                                                                                                                                                                                              |
| Fall 2016   | Teaching Assistant for Tools and Concepts in Ocean Sciences                                                                                                                                                                                |

### Lectures

- My case for using R and Shiny for data visualization [15 min]. Dalhousie Graduate Student Retreat. 05 May 2018

## Training and Workshops

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- Introduction to zooplankton identification, Halifax, NS, Canada (1 day training)
- Slocum glider pilot training with Teledyne Webb Research in North Falmouth, MA, USA (4 day course)
- SEABASS Bioacoustics Summer School, Syracuse University (5 day course)
- Ships and Whales Workshop: Using AIS and Acoustics to Evaluate Exposure and Risk (2 day workshop; MEOPAR-affiliated passive acoustics researchers)

- MEOPeer Training Workshop (4 day workshop; MEOPAR)
- Introduction to passive acoustic monitoring of vessels (4 day course; Canadian Navy)
- Introduction to Density Estimation (1 day workshop; St Andrews researchers at the 2015 Society of Marine Mammology Biennial Conference)
- Analysis of Passive Acoustic Data Using Panguard (1 day workshop; Biowaves researchers at the 2015 Society of Marine Mammology Biennial Conference)
- The low frequency detection and classification system (LFDCS) and digital acoustic monitoring (DMON) hydrophone (1 day workshop; Mark Baumgartner at the Woods Hole Oceanographic Institution)
- SV2 Wave Glider systems operator training (4 day course; Liquid Robotics)

## Sea time

| Date           | Description                                                                                                    | Days |
|----------------|----------------------------------------------------------------------------------------------------------------|------|
| Aug 2018       | F/V Jean-Denis Martin: Right whale visual/acoustic surveys and zooplankton sampling in the Gulf of St Lawrence | 15   |
| Jun - Jul 2018 | R/V Ocean Tracker: Slocum glider deployment/recovery with OTN                                                  | 2    |
| Sep 2017       | Multiple vessels: wave glider deployment/recovery with OTN                                                     | 2    |
| Jul-Aug 2017   | R/V Shelagh: Right whale visual/acoustic surveys and zooplankton sampling in the Gulf of St Lawrence           | 20   |
| Jun 2017       | NOAA Twin Otter [airplane]: sonobuoy deployment in Gulf of St Lawrence                                         | 1    |
| May 2017       | CCGV Peddle: [attempted] acoustic mooring recovery in Roseway Basin                                            | 3    |
| Feb - Apr 2017 | R/V Tioga: hydrophone array and Slocum glider deployment/recoveries as well as zooplankton sampling            | 5    |
| Jul - Sep 2016 | Multiple vessels: Slocum and wave glider deployments/recoveries with OTN                                       | 5    |
| Apr - May 2016 | R/V Gordon Gunter: NOAA Right Whale Survey in the Gulf of Maine                                                | 19   |
| Apr 2016       | R/V Tioga: wave glider test deployments in Cape Cod Bay                                                        | 1    |
| Dec 2015       | CCGV McLaren: acoustic mooring recovery in Roseway Basin                                                       | 4    |
| Jun - Sep 2015 | Multiple vessels: Slocum and wave glider deployments/recoveries with OTN                                       | 10   |
| Jun 2015       | CCGV Peddle: acoustic mooring deployment in Roseway Basin                                                      | 1    |
| Apr - May 2015 | R/V Gordon Gunter: NOAA Right Whale Survey in the Gulf of Maine                                                | 21   |
| Apr 2015       | R/V Tioga: wave glider deployment south of Cape Cod                                                            | 1    |

**Total:** 128 days



## Outreach

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### Selected Media Coverage

- The plight of the right whale  
*Smithsonian* [29 October 2018]
- The call of the North Atlantic right whale  
*The Dalhousie Gazette* [22 October 2018]
- New study aims to improve conversation around North Atlantic right whales  
*Global News Morning* [03 October 2018]
- Dalhousie researchers team up with military to conduct right whale study  
*Global News* [26 September 2018]
- RCAF supports North Atlantic right whale conservation efforts  
*The Maple Leaf - Defence Stories* [27 September 2018]
- The great whale watch: How a data blitz put the plight of endangered animals into sharper relief  
*The Globe and Mail* [25 September 2018]
- NOAA Fisheries Teams Up with Canada for Second Summer of Right Whale Surveys  
*NOAA News* [25 September 2018]
- Armed with data: Unprecedented experiment with Canadian military provides new insights on right whales  
*Dal News* [25 September 2018]
- Interactive tool makes for easier tracking of North Atlantic right whales  
*CBC News New Brunswick* [11 June 2018]
- Guest on the Sheldon MacLeod Show  
*Halifax News 95.7* [13 Jul 2016]
- Teaming up with the Navy to track endangered whales  
*CBC Information Morning* [09 Feb 2016]
- Marine scientists to use navy techniques to study whales  
*The Globe and Mail* [25 Jan 2016]
- Deep diving drones search for endangered right whales off east coast  
*Global National News* [13 Aug 2015]
- Right Whales  
*CBC Land and Sea Documentary* [22 Nov 2015]

### Community Engagement

- Panellist for Sonic Sea screening at Oceans Week HFX [19 September 2018]
- Speaker for Seacology by kayak public marine science lecture series. Lower Prospect, NS, Canada. [03 July 2018 and 29 August 2017]