

Hansen Dalmasse Johnson

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Oceanography Department, Dalhousie University
1355 Oxford St, Halifax NS, Canada, B3H4R2

Education

- May 2015 to Present **Dalhousie University**, PhD¹ candidate in Biological Oceanography
Woods Hole Oceanographic Institution, Guest student in Biology
Advisers: Christopher Taggart (Dal) and Mark Baumgartner (WHOI)
Anticipated graduation: May 2021
¹transferred 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

- Research Assistant** Biology Department, Woods Hole Oceanographic Institution (Apr-June 2014). Assisted with analysis of autonomous real-time marine mammal detections. *Adviser: Mark Baumgartner*
- Fulbright Research Fellow** Norwegian University of Science and Technology (2013-14). Designed and implemented a study of the effect of cold on the photosynthetic ability of a suite of conifer species. *Adviser: Richard Strimbeck*
- Research Assistant** University of Washington Applied Physics Laboratory (Apr-Sep 2013). Analyzed acoustic data from the Fram Strait to identify and compare bowhead whale vocalizations. *Adviser: Kate Stafford*
- Research Assistant** Marine Biological Laboratory and Toolik Field Station (May-Sep 2013). 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*
- Research Assistant** Bates College Environmental Geochemistry Laboratory (Apr-May 2012). Developed and wrote acid-digestion methods for conducting stable isotope analysis on bivalve shell samples. *Advisers: Will Ambrose and Beverly Johnson*

Marine Mammal Observer North Slope Borough Department of Wildlife (Apr-Jun 2011). 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*

Academic Honors

- 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

Scholarships / Fellowships

Current

- 2017-20 Vanier Canada Graduate Scholarship
- 2016-20 NS Graduate Scholarship, Doctoral level

Past

- 2017-19 Killam Predoctoral Scholarship, Doctoral level
- 2017-19 Dalhousie President's Award
- 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

Grants Awarded

2. **Title:** "Development of a Whale Aerial Sampling Platform (WASP)"
Agency: Ocean Frontier Institute (OFI)
Principle Investigators: HD Johnson, MF Baumgartner, MW Brown, CT Taggart
Amount: \$15,000 CAD
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

Other Awards

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

Refereed Publications

In Preparation:

Franklin K*, Taggart CT, Cole TVN, Cholewiak D, Duley P, Crowe L, **Johnson HD**. Using sonobuoys and visual surveys to characterize North Atlantic right whale acoustic ecology in the southern Gulf of St Lawrence.

Johnson HD, Emery P, Morrison D, Taggart CT. WhaleMap: an open source tool for collating and disseminating whale survey data.

Johnson HD, Baumgartner MF, Lin YT, Newhall A, Taggart CT. Acoustic detection range of right whale upcalls detected in near-real time from a moored buoy and a Slocum glider

Submitted:

5. Kowarski KA, Cole A, Gaudet B, Maxner E, Martin BS, **Johnson HD**, Moloney J. Near real-time marine mammal monitoring from gliders: practical challenges, system development, and management implications. Journal of the Acoustical Society of America.
4. **Johnson HD**, Baumgartner MF, Taggart CT. Estimating North Atlantic right whale location following visual or acoustic detection to inform dynamic management. Conservation Science and Practice.

Published:

3. Durette-Morin D*, Davies KTA, Brown M, **Johnson HD**, Moors-Murphy H, Martin B, Taggart CT. (2019). Passive acoustic monitoring predicts daily variation in North Atlantic right whale presence and relative abundance in Roseway Basin, Canada. *Marine Mammal Science*.
2. Pelabon C, Hennet L, Strimbeck R, **Johnson HD**, Armbruster WS (2015) Blossom colour change after pollination provides carbon for developing seeds. *Functional Ecology*.
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*.

*Student

Conference Proceedings

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.

Non-refereed Publications

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

Presentations

36. **Johnson HD**, Baumgartner MF, Lin Y-T, Newhall A, Taggart CT. Probability of passive acoustic detection of right whales from autonomous platforms equipped with a near real-time monitoring system. Poster presentation at: World Marine Mammal Conference. 09 Dec 2019, Barcelona, Spain
35. Durette-Morin D, Evers C, Davies KTA, **Johnson HD**, Lawson J, Martin B, Moors-Murphy H, Taggart CT. Characterizing the seasonal and geographic distribution of North Atlantic right whales (*Eubalaena glacialis*) using an expansive spatial network of passive acoustic moorings. Poster presentation at: World Marine Mammal Conference. 09 Dec 2019, Barcelona, Spain
34. Davies KTA, **Johnson HD**, Durette-Morin D, Baumgartner MF, Davis R, Comeau A, Whoriskey F, Taggart CT. Foraging habitat associations of North Atlantic right whales (*Eubalaena glacialis*) measured using ocean gliders. Oral presentation at: World Marine Mammal Conference. 09 Dec 2019, Barcelona, Spain
33. Franklin KJ*, Taggart CT, Cole TVN, Cholewiak DM, Duley P, Crowe L, **Johnson HD**. Using sonobuoys and visual surveys to describe North Atlantic right whale acoustic ecology in the Gulf of St Lawrence. Oral presentation at: North Atlantic Right Whale Consortium Meeting, 14 Nov 2019, Portland, ME, USA

32. **Johnson HD**, Baumgartner MF, Taggart CT. Uncertainty in right whale location following visual or acoustic detection. Oral presentation at: North Atlantic Right Whale Consortium Meeting, 14 Nov 2019, Portland, ME, USA
31. **Johnson HD**, Baumgartner MF, Taggart CT. Uncertainty in right whale location following visual or acoustic detection. Oral presentation at: MEOPAR Annual Science Meeting, 13 Jun 2019, Victoria, BC, Canada
30. **Johnson HD**. Helpful tools for accessible and reproducible research. Invited seminar at: MEOPAR Annual Training Meeting, 11 Jun 2019, Victoria, BC, Canada
29. Comeau A, Davis R, Davies KTA, **Johnson HD**, Taggart CT, Whoriskey F. Ocean gliders in Eastern Canada. Poster presentation at: European Geosciences Union (EGU), 07 Apr 2019, Vienna, Austria
28. **Johnson HD**, Baumgartner MF, Taggart CT. Estimating uncertainty in right whale location following visual or acoustic detection. Oral presentation at: Conference of Dalhousie Oceanography Graduate Students (CDOGS), 22 Mar 2019, Halifax NS Canada
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, **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

*Student

Academic Involvement

2019-Present	Student Representative on the North Atlantic Right Whale Consortium Board
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

Students

- 2019-20 **Kimberly Franklin**. Adviser on BSc Honours project entitled: "Using sonobuoys and visual surveys to describe North Atlantic right whale acoustic ecology in the Gulf of St. Lawrence"
- 2015-16 **Delphine Durette-Morin**. 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."

Instruction

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

Lectures

- Advancing right whale monitoring [80 min]. Guest lecture for SHAD Canada at Dalhousie University. 16 Jul 2019
- Right whale habitat, entanglement, and ropeless fishing [80 min]. Guest lecture for Fisheries Oceanography at Dalhousie University. 26 Mar 2019
- Right whale habitat and feeding ecology [50 min]. Guest lecture for Marine Mammalogy at Dalhousie University. 20 Mar 2019, 22 Jan 2020
- My case for using R and Shiny for data visualization [15 min]. Dalhousie Graduate Student Retreat. 05 May 2018

Resources

- Personal website with scientific coding blog: <https://hansenjohnson.org>
- Collaborating with international peer group to develop open source, online materials for introductory bioacoustics: <https://intro-acoustics.readthedocs.io>

Training and Workshops

- 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)
- RPAS Advanced Operations Ground School and Flight Training (4 day course; RPAS-OTC)

Sea time

Date	Description	Days
Feb 2020	S/V Balaena: Sperm whale visual/acoustic surveys in the Eastern Caribbean	14
Aug 2019	F/V Jean-Denis Martin: Right whale visual/acoustic surveys and zooplankton sampling in the Gulf of St Lawrence	19
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: 161 days

Outreach

Selected Media Coverage

- Following the food trail to help right whales
Dal News [23 July 2019]
- 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

- Speaker for Pint of Science Halifax [20 May 2019]
- 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]