

# CIARA WILLIS

MIT-WHOI Joint Program  
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[Google Scholar](#)

## RESEARCH INTERESTS

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Exploring marine connectivity and avenues for marine fisheries sustainability with a focus on pelagic predators through studying food web interactions, movement ecology, larval dispersal, life histories, social-ecological systems, global fishing effort, and design & evaluation of marine protected areas using field observations, statistics, and modelling.

## EDUCATION

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| <b>Ph.D.</b> | <b>Massachusetts Institute of Technology &amp; Woods Hole Oceanographic Institution, USA</b><br><i>Joint Program in Oceanography/ Applied Ocean Science &amp; Engineering, Biological Oceanography</i><br>Advisor: Dr. Simon Thorrold<br>Thesis: “Movement and trophic ecology of large pelagic fishes connecting surface waters with the ocean’s twilight zone”   | 2019-2024 |
| <b>B.Sc.</b> | <b>Dalhousie University, Canada</b><br><i>Marine Biology Co-op, Minors Statistics &amp; Ocean Science. First Class Honours</i><br>Advisor: Dr. Julie LaRoche<br>Thesis: “Temporal and spatial trends in microbial plankton communities of the Northwest Atlantic Ocean and influence of 16S rRNA variable region choice on perceived diversity”<br>Visiting student: <b>KAUST</b> , Saudi Arabia & <b>Interuniversity Institute</b> , Israel | 2013-2018 |

## PROFESSIONAL EXPERIENCE

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| 2024-p    | <b>Data Science Instructor</b><br><i>The Carpentries</i><br>Teach introductory courses in R.  |
| 2021-p    | <b>Fisheries Analyst Contractor</b><br><i>Pacific Islands Forum Fisheries Agency; World Wildlife Fund</i><br>Various short-term positions focused on the socioeconomics and ecology of western and central Pacific Ocean tuna fisheries. Primarily role harvest scenario modelling.   |
| 2019-p    | <b>Graduate Research Assistant, Fish Ecology</b><br><i>Biology Dept., WHOI; Ocean Twilight Zone Project</i><br>Advisor: Dr. Simon Thorrold<br>Stable isotope analysis, satellite tagging, and bioeconomic modelling of tuna and swordfish to determine their reliance on the ocean’s twilight zone and implications for fisheries management. |
| 2018-2019 | <b>Research Assistant, Fisheries Economics &amp; Management</b>   |

- Marine Affairs Program, Dalhousie*  
 Advisor: Dr. Megan Bailey  
 Bioeconomic game theoretic modelling of tuna fisheries; Investigation into the value of tuna fisheries subsidies and implications for optimal management solutions.
- 2017 **Summer Student Fellow, Fisheries Oceanography & Larval Ecology**  
*Biology Dept., Woods Hole Oceanographic Institution*  
 Advisor: Dr. Joel Llopiz  
 Determined probable tuna spawning sites in the Phoenix Islands Protected Area via extraction, imaging, and reading of larval otoliths; development of size-at-age function; and biophysical particle backtracking of aged larvae.
- 2016-2018 **Research Assistant, Microbial Genomics & Community Ecology**  
*Biology Dept., Dalhousie*  
 Advisor: Dr. Julie LaRoche  
 Development of a neural network for plankton identification by holographic microscopy; At-sea collection and analysis of planktonic microbial communities; Comparison of methodologies for sequencing and processing DNA.
- 2015 **Biologist, Benthic Ecology**  
*Bedford Institute of Oceanography, Fisheries and Oceans Canada*  
 Supervisor: Dr. Melisa Wong  
 Investigated secondary production and habitat characteristics of the nearshore rocky intertidal. Field work snorkel-based, lab work focused on invertebrate sorting and ID.
- 2015-2017 **Volunteer, Global Fishing Watch**  
*Global Fishing Watch; Biology Dept., Dalhousie*  
 Supervisor: Kristina Boerder  
 Analyzed fishing vessel movements to determine gear type and activity to inform development of GFW algorithms.
- 2014-2019 **Teaching Assistant, Biology**  
*Integrated Science Program, Dalhousie*  
 Instructed and evaluated students on proper lab and field techniques.

## PUBLICATIONS

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- Willis C**, Walsh A, Jahns M, Halloran K, Wang S, Bhatt E. 2023. Student-led mentoring system to lower barriers for graduate school applicants. Special Issue in Building DEI in the Ocean Sciences, *Oceanography* 36(4).
- Sinan H, **Willis C**, Swartz W, Sumaila RU, Forsdyke R, Skerritt D, Le Manach F, Colléter M, Bailey M. 2022. Subsidies and allocation: A legacy of distortion and intragenerational loss. *Frontiers in Human Dynamics* 4:1044321.
- Willis C** and Bailey M. 2020. Tuna trade-offs: Balancing profit and social benefits in one of the world's largest fisheries. *Fish and Fisheries* 21:740-759.
- Hernandez C, Witting J, **Willis C**, Thorrold SR, Llopiz JK, Rotjan R. 2019. Evidence and patterns of tuna spawning inside a large no-take Marine Protected Area. *Scientific Reports* 9:10772.
- Willis C**, Desai D, LaRoche J. 2019. Influence of 16S rRNA variable region on perceived diversity of marine microbial communities of the Northern North Atlantic. *FEMS Microbiology Letters* 366 (13), fnz152.

Zorz J, **Willis C**, Comeau AM, Langille MGI, Johnson CL, Li W, LaRoche J. 2019. Drivers of regional bacterial community structure and diversity over depth and time in the Northwest Atlantic Ocean. *Frontiers in Microbiology* 10:281.

Fisheries Reports

Bailey M, **Willis C**. 2023. Harvest control rules for tuna in the WCPFC: Implications for Indonesia, Philippines, and Vietnam. Report prepared for the World Wide Fund for Nature’s Sustainable Tuna Partnership.

McClellan N, Barclay K, Davila F, Bailey M, Winterford K, **Willis C**. 2021. An indicator framework to monitor contributions to regional sustainable development from Pacific tuna industries. Report prepared for the Pacific Islands Forum Fisheries Agency.

Bailey M, **Willis C**, Sinan H. 2018. Public resource, private profit: Investigating tuna subsidies in the IOTC area of compliance. Proceedings of the IOTC Scientific Committee, Mahé, Seychelles, 3–7 December 2018; Indian Ocean Tuna Commission: Victoria, Seychelles.

In Preparation (expected submission within 3 months)

**Willis C**, Gardner KG, Golet W, Braun CD, Arostegui MC, Houghton L, Thorrold SR. Evaluating the contributions of mesopelagic prey to top teleost predators in the open ocean using compound-specific stable carbon isotope analysis. In prep for *ICES Journal of Marine Science*.

**Willis C**, Hanich Q, Wabnitz C, Bailey M. Implications of tuna harvest strategies for the Coral Triangle. In prep for *Marine Policy*.

**Willis C**, Llopiz JK, McMahan KW, Houghton L, McCarthy M, Thorrold SR. Decadal-scale changes in the Georges Bank ecosystem: Evidence from bulk and compound-specific stable isotope analyses of fish scales. In prep for *Nature Climate Change*.

Arostegui MC, **Willis C**, White C, Thorrold SR, Braun CD. Dive geometry and kinematics of bigeye tuna (*Thunnus obesus*) beyond a continental shelf: Implications for behavioral thermoregulation. In prep for *Journal of Experimental Biology*.

**GRANTS & FELLOWSHIPS (CAD \$144,000 + USD \$254,725 ++)**

2024	<b>Manuel Caboz Scholarship &amp; International Seafood Sustainability Foundation Travel Award</b> to support all costs of attending the 74 <sup>th</sup> Tuna Conference	USD	\$1,065 +travel
	<b>Walter Paul Buoy Workshop Fund</b> , WHOI to support all costs of attending the 2024 MTS Buoy Workshop. <i>Declined</i>		
	<b>Supporting grants for Ocean Sciences Meeting:</b> \$1000 WHOI Academic Programs, \$1000 MIT Student Assistance Fund	USD	\$2,000
2023	<b>Travel bursary for Ocean Tracking Network workshop</b> , OTN	CAD	\$700
	<b>Grassle Fund</b> , WHOI “Establishing mesopelagic food web structure in the North Atlantic via simultaneous, multi-ship sampling”, <b>PI</b>	USD	\$7,500
	<b>MIT Student Assistance Fund</b> to support purchase of underwater photography equipment	USD	\$500
	<b>Supporting grants for ASLO Aquatic Sciences Meeting:</b> \$750 WHOI Academic Programs, \$1000 MIT Student Assistance Fund	USD	\$1,750

	<b>Sustainable Tuna Partnership Contract</b> , WWF “Costs and Benefits of Harvest Strategies in the WCPO”, <b>Co-I</b>	EUR	€32,025
2022-2023	<b>Martin Family Society of Fellows for Sustainability Fellowship</b> , “Movement and trophic ecology of economically valuable top predators connecting surface waters with the ocean’s twilight zone”, <b>PI</b>	USD	\$94,274
2022	<b>Access to the Sea Fund</b> , WHOI, to support RV <i>Haakon</i> cruise, <b>PI</b>	USD	\$10,000
	<b>Supporting grants for GCC</b> : WHOI Academic Programs	USD	\$750
	<b>Supporting grants for ICES PICES ECSC</b> : WHOI	USD	\$1,000
2021-2024	<b>Postgraduate Scholarship-Doctoral</b> , NSERC. <i>In lieu of AGB</i>	CAD	\$63,000
	<b>Alexander Graham Bell Canada Graduate Scholarship-Doctoral</b> , NSERC “Movement ecology and trophic interactions of top predators in the ocean twilight zone”, <b>PI Declined due to non-resident status</b>	CAD	\$105,000
2020	<b>Ocean Venture Fund</b> , WHOI “Trophic ecology of two top predators in the ocean twilight zone, bigeye tuna ( <i>Thunnus obesus</i> ) and swordfish ( <i>Xiphias gladius</i> )”, <b>PI</b>	USD	\$3,446
	<b>Hall-Pratt Fellowship</b> , WHOI	USD	\$41,500
	<b>Supporting grants for Ocean Sciences Meeting</b> : \$750 WHOI Academic Programs, \$360 MIT Student Assistance Fund	USD	\$1,110
2019	<b>Von Damm Fellowship</b> , WHOI	USD	\$14,773
	<b>Stratton Fellowship</b> , WHOI	USD	\$6,414
	<b>Quantitative Ecology and Resource Management Fellowship</b> , University of Washington. <i>Declined</i>	USD	\$18,700
	<b>School of Aquatic and Fisheries Sciences Fellowship</b> , University of Washington. <i>Declined</i>	USD	\$37,400
2018	<b>Career Connect Grant</b> , Mitacs, <b>PI</b>	CAD	\$10,000
	<b>Explore Grant</b> , SSHRC “Disinvesting in global tuna stocks: Welfare economics and the value of tuna”, <b>Co-I</b>	CAD	\$6,500
	<b>Nancy Witherspoon Memorial Summer Research Award</b> . Awarded to top Dalhousie NSERC USRA applicants participating in marine field research	CAD	\$5,000
	<b>Supporting grants for Ocean Sciences Meeting</b> : \$500 Dalhousie Science Society, \$200 Dalhousie Undergraduate Research Committee Fund, \$100 Dalhousie Student Union	CAD	\$800
2017	<b>Summer Student Fellowship</b> , WHOI	USD	\$9,640
2016	<b>Undergraduate Student Research Award</b> , NSERC “Microbial community structure in the Canadian Arctic Ocean”	CAD	\$4,500
	<b>Schulich Ocean Studies Initiative Scholarship</b> . Full funding for 2-week marine science course at the Interuniversity Institute, Israel		
	<b>Red Sea Research Center Visiting Student Research Program</b> . Full funding for 3-week marine science course at KAUST, Saudi Arabia		
	<b>Dalhousie-Bermuda Institute of Ocean Science Scholarship</b> . <i>Declined</i>	USD	\$4,900

	<b>Undergraduate Student Research Award</b> , NSERC “Continuous assessment of plankton abundance and community structure in Canadian coastal waters”	CAD	\$4,500
2015	<b>Undergraduate Research Fellowship</b> , TOSST. <i>Declined</i>	CAD	\$7,000

## HONOURS & AWARDS

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- 2024 **Manuel Caboz Scholarship Award**, Tuna Conference
- 2023 Ranked 2<sup>nd</sup> in **Best Student Presentation Award competition** at NAAFE 2023  
Underwater photography (x3) selected for WHOI’s calendar contest
- 2022 **Martin Family Society of Fellows for Sustainability Fellow**, MIT
- 2021 **Alexander Graham Bell Canada Graduate Scholar**, NSERC
- 2017 **Vemco scholarship** in Marine Biology for significant academic and extracurricular achievement during B.Sc.  
**Hugh P. Bell scholarship** for one of four highest GPAs in the Dalhousie Biology/Marine Biology Honours program
- 2015 **Dalhousie in-course scholarship**
- 2014 **Dalhousie in-course scholarship**
- 2013 **Dalhousie Frederick MacMillen scholarship**

## PRESENTATIONS, PANELS, & WORKSHOPS

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### Invited Presentations & Panels

- Willis C\***, Jin D, Braun CD, Llopiz JK, Thorrold SR. 2024. Can the Ocean Twilight Zone be fished responsibly? WHOI Board of Trustees and Corporation Joint Meeting, Woods Hole (Poster).
- Willis C\***, Gardner KG, Golet W, Braun CD, Arostegui MC, Houghton L, Thorrold SR. 2023. Evaluating the contributions of mesopelagic prey to top teleost predators in the open ocean using compound-specific stable carbon isotope analysis. WHOI Biology Seminar (Oral).
- Willis C\***. 2023. Deep diving in marine predators links surface and deep ocean ecosystems. WHOI Discovery Center annual volunteer recognition event (Oral).
- Willis C\***, Bailey M, Harper S, Wabnitz C. 2023. Presentation of modelled scenarios and live simulation updates at WWF’s “Sustainable Tuna Partnerships Phase 2: Supporting harvest strategies and control rules in the WCPFC” meeting, Manila, Philippines (Lead presenter).
- Lew D\*, Chen A\*, Cojocaru A\*, Meyer S\*, Oremus K\*, Steinkruger A\*, **Willis C\***. 2023. Early Career Researchers in Fisheries Economics Associations. North American Association of Fisheries Economists Forum, Woods Hole, MA, USA (Panel).
- Lee MY\*, DePiper G\*, Meredith J\*, Tyrell M\*, Thieler R\*, Griffin R\*, **Willis C\***, Abe K\*, Asche F\*, McGlinchey D\*, Murphy T\*. 2023. Special Session: Economics and the Woods Hole Science Community. North American Association of Fisheries Economists Forum, Woods Hole, MA, USA (Panel).

- Buesseler K\*, Epps M\*, Renaud P\*, **Willis C\***. 2022. Where the Wild Things Are: What lives in the ocean's midwater and how can it help us address the climate crisis? Ocean Pavilion, United Nations Climate Change Conference COP27, Sharm El Sheikh, Egypt (Oral & Panel).
- Willis C\***, Berumen ML, Bode M, Choukroun S, Ji R, Jones B, Jones GP, Kellner J, Planes S, Thorrold SR. 2021. Comparing estimates of larval dispersal in a coral reef fish derived from a coupled biophysical model and DNA parentage analyses. WHOI Biology Seminar (Oral).
- Willis C\*** and Bailey M. 2019. Tuna trade-offs: Balancing profit and social benefits in one of the world's largest fisheries. Dalhousie Biology Friday Informal Seminar Hour (Oral).

#### Presentations: Scientific

- Braun CD\*, Arostegui MC, Cones S, **Willis C**, White C, Gaube P, Thorrold SR. 2024. Using top predators and novel technologies to explore and understand the deep ocean. International Billfish Symposium, San Diego, CA, USA (Anticipated).
- Willis C\***, Braun CD, Arostegui MC, Skomal G, Thorrold SR. 2024. Extreme dives in swordfish: Characterization of movements and exploration of motivations. Ocean Tracking Network Symposium, Halifax, NS, Canada (Oral, Anticipated).
- Willis C\***, Gardner KG, Arostegui MC, Braun CD, Golet W, Houghton L, Llopiz JK, Thorrold SR. 2024. Evaluating the contributions of mesopelagic prey to tunas and swordfish in the open ocean using compound-specific stable isotope analysis. Tuna Conference, Lake Arrowhead, CA, USA (Oral). *Winner: Manuel Caboz Scholarship & International Seafood Sustainability Foundation Travel Award.*
- Willis C**, Llopiz JK, McMahon KW, Houghton L, McCarthy M, Thorrold SR\*. 2024. A 100-year record of C and N isotope values in amino acids from haddock scales on Georges Bank. Workshop "Synthesizing the state of the science of regime shifts in the Northeast Shelf marine ecosystem", Woods Hole, MA, USA (Oral).
- Willis C\***, Braun C, Arostegui MC, Thorrold SR. 2024. Diving deep: Inferring predatory fish behaviour in the ocean's twilight zone from high-resolution measurements of movement. Bio-Logging Science Symposium, Tokyo, Japan (Poster).
- Braun C\*, Arostegui MC, **Willis C**, White C, Thorrold SR. 2024. Using top predators and novel technologies to explore and understand the deep ocean. Bio-Logging Science Symposium, Tokyo, Japan (Oral).
- Willis C\***, Llopiz JK, McMahon KW, Houghton L, McCarthy M, Thorrold SR. 2024. Decadal-Scale Changes in the Georges Bank Ecosystem: Evidence from Bulk and Compound-Specific Stable Isotope Analyses of Fish Scales. Ocean Sciences Meeting, New Orleans, LA, USA (Oral).
- Willis C\***, Braun C, Arostegui M, Houghton L, Gardner KG, Govindarajan A, Thorrold SR. 2023. Simultaneous sampling of a mesopelagic food web from bottom to top. Twilight Zone Symposium, Woods Hole, MA, USA (Poster).
- Gardner KG\*, Houghton L, Llopiz JK, **Willis C**, Batta Lona P, Bucklin A, Thorrold SR. 2023. Mesopelagic Food Webs Across Time and Space. Twilight Zone Symposium, Woods Hole, MA, USA (Poster).
- Willis C\***, Braun C, Arostegui M, Houghton L, Gardner KG, Govindarajan A, Thorrold SR. 2023. Bottom to top: Tracing the flow of carbon through mesopelagic food webs up to large migratory predators. ASLO Aquatic Sciences Meeting, Palma de Mallorca, Spain (Oral).

- Willis C\***, Bailey M, Harper S, Wabnitz C. 2023. Costs and Benefits of Western & Central Pacific Tuna Harvest Strategies for Coral Triangle Countries. North American Association of Fisheries Economists NAAFE Forum, Woods Hole, MA, USA (Oral). *Second place Best Student Presentation Award*.
- Willis C\***, Llopiz J, McMahon KM, Houghton L, McCarthy M, Thorrold SR. 2022. Decadal-scale changes in the Georges Bank ecosystem: Evidence from bulk and compound-specific stable isotope analysis of fish scales. Graduate Climate Conference, Seattle, WA, USA (Oral).
- Willis C\***, Gardner KG, Golet W, Houghton L, Thorrold SR. 2022. Inferring the trophic ecology of top predators in the ocean's twilight zone through stable carbon isotope analysis of amino acids. ICES PICES Early Career Scientist Conference, St John's, NL, Canada (Oral).
- Willis C\***, Gardner KG, Golet W, Houghton L, Thorrold SR. 2022. Evaluating the contributions of epipelagic vs mesopelagic foods webs to three top predators through stable carbon isotope analysis of amino acids. Ocean Sciences Meeting, Honolulu, HI, USA (Poster).
- Willis C\*** and Bailey M. 2020. Tuna trade-offs: Balancing profit and social benefits in one of the world's largest fisheries. Ocean Sciences Meeting, San Diego, CA, USA (Oral).
- Willis C** and Bailey M\*. 2019. Tuna trade-offs: Balancing profit and social benefits in one of the world's largest fisheries. North American Association of Fisheries Economists NAAFE Forum, Halifax, NS, Canada (Poster).
- Bailey M, **Willis C**, Sinan H. 2018. Public resource, private profit: Investigating tuna subsidies in the IOTC area of compliance. 21<sup>st</sup> Scientific Committee Meeting of the Indian Ocean Tuna Commission, Seychelles (Presented by the South African delegation).
- Willis C\***, LaRoche J. 2018. Temporal and spatial trends in microbial plankton communities of the Northwest Atlantic Ocean and influence of methodology on perceived diversity. Conference of Dalhousie Oceanography Students, Halifax, NS, Canada (Poster).
- Willis C\***, Hernandez C, Rotjan R, Witting J, Thorrold SR, Llopiz JK. 2018. Tuna in the Phoenix Islands Protected Area: Identification of probable spawning sites using larval distributions and particle backtracking. Ocean Sciences Meeting, Portland, OR, USA (Poster).

#### Presentations: DEI and Education

- Wang S\*, Galochkina M, Liu A, Mahesh A, Moskvichev R, Nsude C, **Willis C**, Puxley B. 2023. The Graduate Climate Conference: Insights on a Community-Driven Student Conference and its Merits for Early-Career Researchers. AGU, San Francisco, CA, USA (Oral).
- Bhatt E, Freilich M, Halloran K, Jahns M, Suca JJ, Walsh A, Wang S, **Willis C\***. 2022. Sustainable growth of a graduate school application peer mentoring initiative by MIT-WHOI Joint Program students. Ocean Sciences Meeting, Honolulu, HI, USA (Oral).
- Beaulieu S\*, Alexander H, Jamieson S, Longworth B, McLean C, Soenen K, York A, Krinos A, Cai L, Govostes R, Hernandez C, **Willis C**. 2020. Building a data science curriculum and community for ocean scientists, engineers, and students using The Carpentries model. AGU, Online (Poster).

#### Workshops

- Datathon project lead. 2023. "Deviations from diel vertical migration in swordfish" for Ocean Tracking Network/Canadian Statistical Sciences Institute workshop, Halifax, NS, Canada.

**Willis C\***, Wang S\*. 2022. Development of a graduate school application peer mentoring program. Graduate Climate Conference, Seattle, WA, USA (Workshop).

### Other

Session Chair: “Environmental Management and Climate Adaptation.” 2023 Graduate Climate Conference, Woods Hole, MA, USA.

WHOI delegation member & Ocean Pavilion host, 2022 United Nations Climate Change Conference COP27, Sharm El Sheikh, Egypt.

\*Presenting author

## **TEACHING & MENTORING EXPERIENCE**

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- 2020-2023 **Board Member, Applicant Support and Knowledgebase (ASK)**  
*MIT-WHOI Joint Program*  
Co-ran the JP ASK program. JP ASK’s mission is to make the graduate school application process more transparent by providing current student mentors to applicants who are historically underrepresented in and/or unfamiliar to MIT, WHOI, or ocean sciences.
- 2019-2023 **Mentor, Applicant Support and Knowledgebase**  
*MIT-WHOI Joint Program*  
Advised and supported prospective students on the grad school application process.
- 2023-2024 **“Marine Predators!” Outreach**  
*WHOI; Yankey Foundation*  
Designed and presented interactive sessions on “Marine Predators!” and the Ocean Twilight Zone to elementary school-aged kids at the Roxbury Boys & Girls Club and to adults with disabilities at the House of Possibilities.
- 2022 **OceanSenses Sight Team**  
*Advancing Knowledge of Methane in the Arctic*  
Developed teaching tools to bring a sensory experience of the deep ocean to students.
- Session Instructor**  
*WHOI Blue Economy Short Course*  
Designed and taught a session on food webs and stable isotope analysis for undergraduate students with a partner, including a data analysis activity.
- Children’s Game Marine Biology Consultant**  
*Small Monsters Games*  
Provided creative input, research, and feedback on card game “Undersea Explorers: Coral Reef Adventure”
- 2021 **Co-Chief Scientist**  
*MIT-WHOI Joint Program; RV Neil Armstrong*  
Organized and led scientific activities pre-cruise & at-sea for a science party of 16 junior JP students, including designing sampling plan, collaborating with relevant parties, and general administration.
- Guest Lecturer**  
*Cape Cod Community College, BIO152*  
Designed and taught a session on vertebrate evolution for General Biology II.



- Elementary School Outreach**  
Designed and led two sessions on ocean animal adaptations for a local grade 4 class.
- 2020-2021 **Teaching Assistant, Software Carpentry Workshop in R**  
*WHOI; The Carpentries*  
Assisted students with questions & troubleshooting and led problem-solving activities for four introductory R courses over Zoom.
- 2020 **R Tutor**  
Private tutor in R for a student taking the edX course “Data Science: R Basics”.
- Mentor, Summer Student Fellow**  
*WHOI*  
Provided academic and personal support to a WHOI SSF.
- 2016-2019 **Peer Mentor**  
*Integrated Science Program, Dalhousie*  
Provided academic and personal support to one or two first year students a year.  
Panelist at three orientation events.
- 2016 **Research Project Supervisor**  
*Integrated Science Program, Dalhousie*  
Designed a 4-month project examining the impacts of temperature changes on marine bacterial communities and provided leadership for two first year students to collect, analyze, and present data.
- 2014-2019 **Teaching Assistant, Biology**  
*Integrated Science Program, Dalhousie*  
Instructed and evaluated students on proper lab and field techniques.

## TECHNICAL SKILLS

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**Software:** R (highly proficient: intro course instructor; experienced in multivariate statistics, modelling, graphics, function development, etc.); GIS (novice); MATLAB (novice); Ocean Data Viewer (intermediate).

**Lab:** Gut content analysis; Necropsy; Otolith extraction (adult & larval); DNA extraction; Dissection & holographic microscopes.

**Field:** Oceanographic cruises (20 wks); Species ID; Scientific diver (AAUS, ESDP; Nitrox, Drysuit); First Aid; Small boat operator; Tagging of large pelagics; Underwater photography.

**Certifications:** PADI Advanced Open Water SCUBA; Canadian Council on Animal Care Fish & Wildlife handling; IACUC Working with Fish in Research Settings; Standard & Diver First Aid; Marine mammal stranding training.

**Other:** French Immersion graduate (professional proficiency); Bookkeeping.

## OTHER EDUCATION & CERTIFICATION

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2024 **Woods Hole Oceanographic Institution, USA**

Media Training; *Lead Michael Holland*

Science Communication in a Crisis; *Lead: Dr. Chris Reddy, Ken Kostel*

2023 **Ocean Tracking Network & Canadian Statistical Sciences Institute, Canada**

Advancing Statistical Methods for the Analysis of Complex Biologging Data Collected from Humans and Animals Workshop

**Woods Hole Oceanographic Institution, USA**

Biologger Tag Data Analysis Workshop; *Lead: Dr. Camrin Braun, Connor White; & Public Science Engagement Using Online Tools: How To Do It and Why You Should; Lead: Dr. David Shiffman (workshop organized & hosted by C Willis & Ken Kostel)*

**University of the Azores, University of Porto, & MIT Portugal Program**

Marine Robotics Summer School

2022 **Broad Institute of MIT and Harvard, USA**

Research Mentoring Certificate Program; *Lead: Dr. Bruce Birren*

2021 **University of New Mexico Center for Stable Isotopes, USA**

“IsoCamp” Stable Isotopes in Ecology Workshop; *Lead: Dr. Seth Newsome*

2018 **Beakerhead, Canada**

Science Communication Workshop; *Lead: Jay Ingram*

2016 **King Abdullah University of Science and Technology, Saudi Arabia**

Visiting Student, Red Sea Research Center; *Lead: Dr. Michael Berumen*

2016 **Interuniversity Institute, Israel**

Visiting Student; *Lead: Dr. Amatzia Genin*

**OCEANOGRAPHIC CRUISES (20 WEEKS)**

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2022	2 weeks	NW Atlantic, Ocean Twilight Zone MOCNESS trawl, NOAA ship <i>Henry B Bigelow</i>
	2 weeks	Svalbard, Advancing Knowledge of Methane in the Arctic, RV <i>Kronprins Haakon</i>
2021	3 days	<b>Co-Chief Scientist</b> , NW Atlantic, introductory student cruise, RV <i>Neil Armstrong</i>
	1 week	NW Atlantic, Ocean Twilight Zone mooring & glider deployment, RV <i>Neil Armstrong</i>
2018	3 weeks	Gulf of St. Lawrence, DFO fish & invertebrate trawl survey, CCGS <i>Teleost</i>
	5 weeks	Labrador Sea, microbial sampling, RV <i>Maria S. Merian</i>
2017	2 weeks	Slope Sea, ichthyoplankton sampling, NOAA ship <i>Gordon Gunter</i>
2016	3 weeks	Scotian Shelf, Atlantic Zone Monitoring Program, microbial sampling, CCGS <i>Hudson</i>
	2 weeks	Scotian Shelf, Atlantic Zone Monitoring Program, microbial sampling, CCGS <i>Hudson</i>

**OTHER FIELD WORK**

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2023	2 days	Cape Cod, swordfish tagging, RV <i>Tioga</i> . PI Braun
	1 day	Azores, collection of shark-associated pilotfish. Small boat ops. PI Fontes
2022	4 days	Cape Cod, shark tagging (blues, makos, porbeagles). FV <i>Machaca</i> . PI Braun (1d) and PI McDonnell/Hammerschlag (3d)
	2 weeks	USVI, coral reef research (deployed underwater equipment, conducted fish/coral surveys, etc.). SCUBA and small-boat based ops. PI Aoki/Mooney
2015	3 months	Nova Scotia, rocky intertidal snorkel-based invertebrate/algae community collection. PI Wong

## SERVICE & SYNERGISTIC ACTIVITIES

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- 2023-2024 “Marine Predators!” & “Dive into the Ocean’s Twilight Zone” **outreach** events at Boys & Girls Club and House of Possibilities with the Yawkey Foundation
- 2019-2023 **Board Member & Mentor**, JP Applicant Support and Knowledgebase
- 2023 Graduate Climate Conference **Organizing Committee** (Logistics Chair)  
Graduate Climate Conference **Session Chair**  
North American Association of Fisheries Economists Forum **Organizing Committee**  
**Organizer** of Science Communication workshop for WHOI community  
“Between Two Robots” interviewee for WHOI’s Ocean Twilight Zone project  
Ocean “champion” for education module on deep diving ocean predators with Scoutier (interviewee for topic intro; middle school level program)  
Woods Hole Science Stroll booth volunteer
- 2022-2023 Waterlust Marine Science Trivia WHOI Host
- 2021-2022 **Treasurer**, Joint Program Student Organization  
**Biology Representative**, WHOI Student Organization
- 2020-2022 **Student Representative**, WHOI Institutional Safety Committee
- 2019 MIT Museum Girls’ Day exhibit demonstrator on ocean acidification  
North American Association of Fisheries Economists Forum Financial Committee
- 2016-2018 Responded to marine mammal strandings with the Marine Animal Response Society
- 2015-2017 **Treasurer** of Dalhousie Association of Marine Biology Students. Society of the year award 2015-2016
- 2017 “Careers in Marine Science” presentation to grade 10 students for Career Day
- 2014, 2017 Disinterred composted minke (2014) and blue (2017) whales with Dalhousie Whale School
- 2016 Ocean School contributor in plankton ecology
- 2015 Shark necropsy presenter with For the Love of Sharks at the Halifax Natural History Museum to engage the public, especially children

## MANUSCRIPT REVIEWER

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Frontiers in Marine Science; Global Change Biology

## PROFESSIONAL MEMBERSHIPS

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The Oceanography Society; Association for the Sciences of Limnology and Oceanography; International Bio-Logging Society; North American Association of Fisheries Economists; Society for Women in Marine Science

## MEDIA COVERAGE

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- 2024 **TED** “Audacious Dreams: Celebrating the first class of Audacious Projects”, *including top predator ocean twilight zone diet sourcing results from CW led research*  
<https://www.ted.com/talks/the-audacious-project-audacious-dreams-celebrating-the-first-class-of-audacious-projects>
- Oceanus** “Can the ocean twilight zone be fished responsibly?” *Feature on CW thesis research*
- 2023 **Harvest Strategies.org** “Harvest Strategy for Yellowfin Tuna for The Western and Central Pacific? Project Benefits Abound Among Possible Future Scenarios” *on Manila Sustainable Tuna Partnership meeting* <https://harveststrategies.org/blog/2023/08/23/harvest-strategy-for-yellowfin-tuna-for-the-western-and-central-pacific-project-benefits-abound-among-possible-future-scenarios/>
- Scoutier** “OTZ Ciara Willis Challenge Video” *for middle/ high school education module “Diving into the Ocean Twilight Zone”* [scoutier.com](http://scoutier.com)
- Bureau of Fisheries and Aquatic Resources (Philippines)** *interview on results of Manila Sustainable Tuna Partnership meeting*
- WHOI** “Marlon & Ciara: Between Two Robots” *interview (style of Between Two Ferns) for the Ocean Twilight Zone project* <https://twitter.com/WHOI/status/1639341932504846336?s=20>
- MIT EAPS News** “Balancing Ocean Research and Fieldwork” *CW spotlight*  
<https://eapsweb.mit.edu/news/2023/balancing-ocean-research-and-fieldwork>
- Oceanus** “Casting a (long) line to the twilight zone food web” *Feature including CW thesis research* <https://www.whoi.edu/oceanus/feature/casting-a-long-line-to-the-twilight-zone-food-web/>
- 2022 **WHOI** “OTZ project featured at COP27” <https://twilightzone.whoi.edu/otz-project-featured-at-cop27/>
- WHOI** “Speak for the Ocean” *video campaign leading up to COP27*  
<https://twitter.com/WHOI/status/1591944220176257024>
- WHOI** “Spotlight: Ciara Willis” <https://twilightzone.whoi.edu/spotlight-ciara-willis/>

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