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MMM class of 2016 (front row, left to right): Monica Reed, Roxanne Graham, Alba Garcia Rodriguez, Meghan Borland, Kendra Moore, Teresa MacDonald, Jordan Gardiner, Laurie Starr, Lauren Dehens. (Back row, left to right): Peter Wessels, Emiley MacKinnon, Jenny Weitzman, Augusta Lipscombe, Catherine Schram, Kayla Glynn, Laura Miller, Travis Aten.

## CONGRATULATIONS TO THE MMM CLASS OF 2016!

Members of the graduating class of 2016 presented their research projects in December at the Making Waves: Graduate Project Presentations event. This issue of MAP Matters celebrates the MMM Class of 2016 and provides detail on their exciting research that took place here in Nova Scotia as well as across Canada, the United States, Asia and the Caribbean.

## GOLD AWARD RECIPIENT

[Alba Garcia Rodriguez](#) is this year's recipient of the 2016 [Gold Award](#).

This award, named in honour of Dr. Edgar Gold, (a founder of Dalhousie Oceans Studies Programs), is an annual financial award presented to the MMM graduate who best exemplifies the characteristics of an "honest broker" and has acquired the knowledge, skills and attitudes necessary to be a leader in the field of marine affairs.



## MARINE AFFAIRS MILLENNIUM PRIZE AWARDS

The [Marine Affairs Millennium Prize Awards](#) were presented to the MMM Class of 2016 at Making Waves. The recipients were (top left to bottom right):

- Alba Garcia Rodriguez** (Interdisciplinary of the Year)
- Jordan Gardiner** (Marine Management)
- Augusta Lipscombe** (Marine Science & Technology)
- Jenny Weitzman** (Marine Policy)

CONGRATULATIONS & BEST WISHES FROM THE MAP FAMILY TO ALL AWARD RECIPIENTS

## 69TH GULF & CARIBBEAN FISHERIES INSTITUTE CONFERENCE



Roxanne Graham and Alba Garcia-Rodriguez, members of the MMM class of 2016, attended the [69th Gulf & Caribbean Fisheries Institute \(GCFI\) Conference](#) held in November, 2016 in Grand Cayman. The conference focuses on solving marine problems by applying fishers' knowledge and marine science. Specifically, the conference brought together users of ocean resources to make informed and coordinated decisions about sustainable resource use and integrate new knowledge into Marine Protected Areas management.

Roxanne Graham (left) presented under the 'Climate Change and Adaptation' theme. Her presentation was based on future planning for marine invasive species in the Wider Caribbean in the face of climate change, and was informed by a comparison of eight Caribbean country management plans for the invasive Indo-Pacific lionfish. Alba García Rodríguez (right) presented under the 'Reefs and Associated Ecosystems: Conch and other Invertebrates' theme. Her presentation provided information on the abundance of queen conch (*Lobatus gigas*), and the management challenges this species face in the Grenadine Islands.



Overall, the candidates described their experience at the conference as informative and invaluable. In addition to networking with key individuals associated with Caribbean marine science and Caribbean fisheries, they were both able to incorporate new findings from the conference into their graduate research project. Their participation in the conference was made possible by their graduate research supervisor Dr. Lucia Fanning, the Marine Affairs Program and the Sobey Fund for Oceans.

Roxanna and Alba were joined by other members of the MAP family that attended and presented at the conference. Pictured here, left to right, is Sonia Jind, MMM 2014 (Monitoring Coordinator, Sustainable Grenadines, Saint Vincent and the Grenadines) Alba, Stacey Sybersma, MMM 2014 (Environmental, Health Safety Specialist, Caribbean Utilities Company, Grand Cayman), Nicolas Winkler, MMM 2016, Roxanne, and Orlando Harvey, MMM 2009 (National MPA Biologist, Grenada Fisheries Division, Grenada).



\*Photographs taken by Davon Baker.

## INTERNSHIP REPORTS

During the summer of 2016, members of the MMM class conducted internships and worked on their graduate project research in Nova Scotia, New Brunswick, British Columbia, California, Indonesia, St. Vincent and the Grenadines, Grenada and the Maldives. The following pages provide information on the student's internship placements and graduate project research. The full text of the MMM Graduate Projects are available on the MAP Dalspace at <https://dalspace.library.dal.ca/handle/10222/13001>.

### TRAVIS ATEN

Travis had a busy summer, completing two internships placements—the first at the [Northwest Atlantic Fisheries Organization](#) (NAFO) located in Dartmouth, NS with MMM alum Jana Aker and the second at the [Ecology Action Centre](#) in Halifax under the supervision of Susanna Fuller. While at NAFO Travis spent his time focusing on international shark management by RFMOs and was able to attend NAFO meetings as an observer. At the Ecology Action Centre, Travis and Susanna worked on a report supporting the need for improved biodiversity protections for areas beyond national jurisdiction.

**Graduate Project:** [The application of the ecosystem approach and future directions for the international management of migratory sharks in the Northwest Atlantic](#)

**Supervisor:** David VanderZwaag (Schulich School of Law, Dalhousie)







*MEGHAN BORLAND*

**Meghan** completed her internship at [Yayasan Masyarakat dan Perikanan Indonesia \(MDPI\)](#), an NGO, located in Bali, under the [Improving Fisheries Information and Traceability of Tuna \(IFITT\)](#) Project. The IFITT project has implemented traceability systems within small-scale tuna fisheries in Indonesia, in order to enable sustainable data collection. Under the supervision of internship host Momo Kochen, Meghan's internship focused on the economic component of the IFITT project. During her internship, Meghan compiled data on the costs of the implementation of traceability systems across small-scale handline tuna fisheries in Indonesia. In addition, in order to understand how processing differs following the

implementation of traceability technology, Meghan spent two weeks in tuna processing plants conducting a time/cost processor collection study.

**Graduate Project:** [A tale of two standards: A case study of the Fair Trade certified Maluku handline caught tuna \(\*Thunnus albacares\*\) fishery](#)

**Supervisor:** Megan Bailey (Marine Affairs Program, Dalhousie)

## *KRISTA BOUWMAN*

**Krista** spent the summer working with [MEOPAR](#), an organization that is dedicated to improving Canada's ability to manage and respond to risk in the marine environment. On the east coast, MEOPAR has aided significantly in the conservation of the North Atlantic right whale. During her internship Krista conducted an analysis of the Scotia-Fundy vessel users; this entailed obtaining data from their Automatic Identification System and using the program R to process the data. Under the guidance of Dr. Chris Taggart, Krista was able to gain more insight on activities conducted and types of vessels found in the Scotia-Fundy region. The newly gained knowledge has helped her have a better understanding of the threats present in the region for right whales.



**Graduate Project:** [An analysis of Scotia-Fundy vessel users and what this means for the North Atlantic right whales](#)

**Supervisor:** Christopher Taggart (Department of Oceanography, Dalhousie)

## *LAUREN DEHENS*

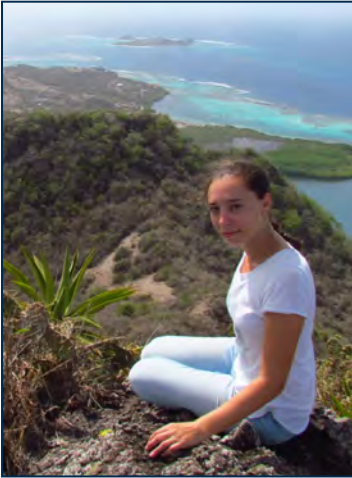


For her internship, **Lauren** worked out of the [St. Andrews Biological Station \(SABS\)](#) with hosts Dr. Peter Lawton and Dr. Andrew Cooper of the Department of Fisheries and Oceans. Her work over the internship consisted of research gathering and reviewing for the existing ecologically and biologically significant areas (EBSAs) and Significant Benthic Areas (SBAs) in the Bay of Fundy, Quoddy Region. This data served to re-evaluate the existing EBSAs and SBAs in place, to better site areas of interest for marine protected areas in the future. A focus was also taken to review the historical and ecological significance of Musquash Marine Protected Area, as it relates to her graduate project. Funding from the [Canadian Healthy Oceans Network \(CHONE\)](#) project supported Lauren's research.

**Graduate Project:** [What counts in making MPAs count: The role of legitimacy as a contributor to perceived MPA success in Canada](#)

**Supervisor:** Lucia Fanning (Marine Affairs Program, Dalhousie)

## ALBA GARCIA RODRIGUEZ



Alba completed her internship with [Sustainable Grenadines Inc.](#) in St. Vincent and the Grenadines under the supervision of Orisha Joseph. Alba conducted monitoring activities of queen conch in Union Island, with the collaboration of the Tobago Cays Marine Park Rangers and the local community, including fishermen. Monitoring activities of this important marine species were conducted under the Eastern Caribbean Marine Managed Areas Network ([ECMMAN](#)) Project. Participatory mapping, as well as underwater surveys resulted in the acquisition of scientific data that generated increased knowledge of conch abundance in the area. The information obtained will be used to improve current management of this species, and contribute to its conservation.

**Graduate Project:** [Queen conch in the Grenadines islands: A preliminary assessment on its abundance and current management needs](#)

**Supervisor:** Lucia Fanning (Marine Affairs Program, Dalhousie)

## JORDAN GARDINER

Jordan joined the [WWF-Canada](#) team in the summer of 2016 in Halifax. For her internship, Jordan worked under the supervision of Aurelie Cosandey-Godin, MMM Alumni, on an internal report for WWF-Canada's *Food for All* Initiative. The internal report focused on the use and markets of forage fish (a species of fish of interest to humans chiefly as the prey of more valuable game fish) within Canada. For this report, Jordan had the opportunity to use both desktop research as well as speak with a variety of stakeholders. Jordan gained invaluable experience and skills related to WWF-Canada program delivery, project management, and stakeholder engagement.

**Graduate Project:** [Small and Mighty: Why forage fisheries management could benefit from an ecosystem based framework. A case study on Bay of Fundy/Southwest Nova Scotia herring stock component](#)

**Supervisors:** Laura Hussey-Bondt (Fisheries and Oceans Canada) & Ramon Filgueira (Marine Affairs Program, Dalhousie)



## KAYLA GLYNN



[Clear Seas Centre for Responsible Marine Shipping](#) was Kayla's internship host in Vancouver, BC. Under the supervision of Jody Wright, Kayla's work over the internship consisted primarily of research and data gathering for her project regarding the legislation and policy associated with intergovernmental and international environmental damage compensation regimes. Thanks to support from [Mitacs](#) and Clear Seas, Kayla was able to travel to London, England in order to conduct interviews with claims managers at the International Oil Pollution Funds (IOPC Funds) and technical experts at the International Tanker Oil Pollution Federation (ITOPF). The recommendations from her project will be provided to Clear Seas, the IOPC Funds, and ITOPF among other interested stakeholders. Additionally, Kayla was able to contribute to many of Clear Seas' outreach and engagement projects, which she greatly enjoyed. Kayla continues to be employed by the communications team at Clear Seas.

**Graduate Project:** [Who's Paying the Bill? Assessing and Valuing Damage to the Marine Environment in Accordance with the Polluter Pays Principle for the Practical Purpose of Compensation after Ship - Source Oil Spills](#)

**Supervisor:** Aldo Chircop (Schulich School of Law, Dalhousie)

## ROXANNE GRAHAM

**Roxanne** returned to her home country of Grenada to complete her internship with the [Fisheries Division of the Ministry of Agriculture, Land, Forestry, Fisheries and the Environment](#). Under the supervision of the National MPA Coordinator, Mr. Roland Baldeo and the National MPA Biologist and MMM Alumni, Mr. Orlando Harvey, she was able to gain invaluable experience and skills related to project delivery, stakeholder engagement and community outreach. Roxanne was a coordinator of the official launch of the lionfish control project, teacher under the lionfish education program for local schools in coastal communities, and coordinator of other lionfish campaigns. She was also the Lead Coordinator of the MPA Summer Camp Program. Roxanne's MMM degree was supported by the [Queen Elizabeth Scholarship](#).



**Graduate Project:** [A Comparison of Eight Country Plans for the Invasive Indo-Pacific Lionfish in the Wider Caribbean](#)

**Supervisor:** Lucia Fanning (Marine Affairs Program, Dalhousie)

## AUGUSTA LIPSCOMBE



**Augusta** worked as an intern with the [Maritime Activity and Risk Investigation Network \(MARIN\) Research Group](#) in the Industrial Engineering Department, Dalhousie University under the supervision of internship host, Dr. Ronald Pelot. Augusta's work focused on understanding the legal requirements of ballast water management in Canada, as well as performing a regional environmental risk assessment regarding ballast-sourced species invasions. During her internship, Augusta gained skills relating to both policy analysis and risk assessment as well as a general understanding of ballast water management, both nationally and globally. She was also able to develop her GIS and statistical analysis skills, and had the opportunity to network and consult with various professions in industry, government and academia.

**Graduate Project:** [Assessing the current and future risk of ballast-sourced species invasions in Canada's eastern Arctic under a climate change scenario](#)

**Supervisor:** Ron Pelot (Industrial Engineering, Dalhousie)

## TERESA MACDONALD

**Teresa** completed her internship with the [Department of Oceans and Fisheries \(DFO\)](#) at the Bedford Institute of Oceanography. While completing her internship at DFO she was supervised by Dr. Ian Bradbury. Her work over the internship consisted mainly of research and data gathering for her graduate project paper, which involved evaluating the use of adaptive management inside MPA boundaries and fisheries regulations outside of the MPA boundaries.

**Graduate Project:** [Using Adaptive and Fisheries Management to Increase MPA Success: A Case Study of the Gilbert Bay MPA](#)

**Supervisor:** Ramon Filgueira (Marine Affairs Program, Dalhousie)





## EMILEY MACKINNON

Emiley completed her internship with the Coastal Ecosystem Science Division at Fisheries and Oceans Canada in Dartmouth, N.S. Within the division she worked with the Aquatic Invasive Species Monitoring Network under the supervision of Angelica Silva and Dawn Sephton. Throughout her time at DFO, Emiley primarily aided with the yearly invasive species monitoring project and gained experience with planning field excursions, preparing field equipment, and working with members of the public in shared spaces. Emiley chose to focus her graduate project on an unrelated topic, which involved conducting a critical assessment and gap analysis of existing recovery strategies for the Atlantic leatherback sea turtle. This work was inspired by the upcoming amendment to the SARA recovery strategy for the Atlantic population, to be published by DFO in 2017.



**Graduate Project:** A critical assessment and gap analysis of existing recovery strategies for the Atlantic leatherback sea turtle (*Dermochelys coriacea*)

**Supervisor:** Sean Brilliant (Canadian Wildlife Federation)



## LAURA MILLER

**Laura** had the pleasure of interning with [Fair Trade USA](#) in Oakland, California under the supervision of Ashley Apel. Fair Trade's Seafood Program helps to strengthen fisher livelihoods by incentivizing seafood supply chains to adhere to robust and rigorous environmental and social standards that promote safe, fair working conditions and healthy, thriving communities. Laura's work with the Seafood team included market research that helped to inform the expansion of the recently established program, public communications projects that promoted Fair Trade seafood, and the creation of a toolkit that is now used to help certificate holders understand Fair Trade's traceability requirements and how these can best be met.

**Graduate Project:** [The fair way or the Chiloé? Exploring the role of certification in the governance of labour in aquaculture in Chiloé, Chile](#)

**Supervisor:** Matthew Schnurr (International Development Studies, Dalhousie)

## KENDRA MOORE

**Kendra** travelled to Ahousaht, BC to complete her internship with the [Whale Habitat and Listening Experiment](#) (WHaLE) project with Dr. Dave Duffus of the University of Victoria's Whale Research Laboratory. WHaLE is a [MEOPAR](#) project, which aims to address whale-vessel risk utilizing passive acoustic monitoring technology. During her internship, Kendra assisted in underwater acoustic data collection, sea surface whale observations and the analysis of eastern Pacific gray whale vocalizations within Clayoquot Sound, BC. The interaction of vessel noise and gray whale vocalizations were analyzed within her graduate project to identify the implications for management and policy of acoustic disturbance from whale watching vessels for gray whales.



**Graduate Project:** [Evidence-informed conservation policies: Mitigating vessel noise within gray whale \(\*Eschrichtius robustus\*\) foraging habitat in British Columbia, Canada](#)

**Supervisor:** Peter Wells (Adjunct Professor, Marine Affairs Program, Dalhousie)

## MONICA REED



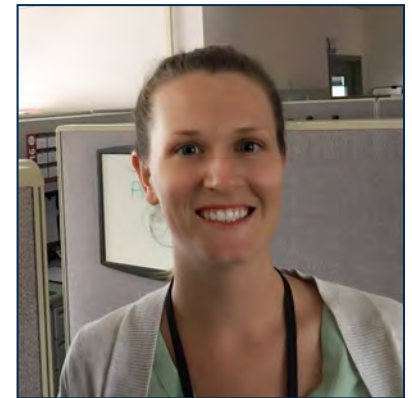
[Sustainable Grenadines Inc.](#) on Union Island also hosted **Monica's** internship. Under the supervision of Orisha Joseph, Monica had the opportunity to lead a project focused on minimizing yachting impacts within two marine protected areas, allowing her to gain project planning, in-water data collection and stakeholder engagement experience. She also assisted with other initiatives, including monitoring and tagging leatherback sea turtles and programming for the celebration of the Caribbean Endemic Bird Festival. Furthermore, SusGren hosted the 2016 Annual Meeting of the Grenadines Network of MPAs which Monica had the opportunity to attend and assist with, allowing her to make connections with a diverse set of people, from MPA managers to biologists to politicians.

**Graduate Project:** [Towards adaptive management of mooring systems to reduce the threats of yachting tourism in marine protected areas.](#)

**Supervisor:** Orlando Harvey (National MPA Biologist, Grenada Fisheries Division)

## CATHERINE SCHRAM

**Catherine** worked in the Oceans and Coastal Management Division at the [Department of Fisheries and Oceans Canada](#) in Dartmouth, NS. Her internship, supervised by Maxine Westhead (MAP Adjunct Professor), allowed her to gain first hand experience in the research, planning, and consultations necessary for marine protected area establishment in Canada. Throughout her time at DFO Catherine assisted with a number of projects, including compiling information on ecologically and biologically significant areas in the Maritimes Region, conducting an MPA assessment, attending a fisheries association consultation, and assisting with a public open house to engage local Nova Scotians on marine protected areas and ocean conservation in the province. Funding from the [Canadian Healthy Oceans Network](#) (CHONE) project supported Catherine's research.

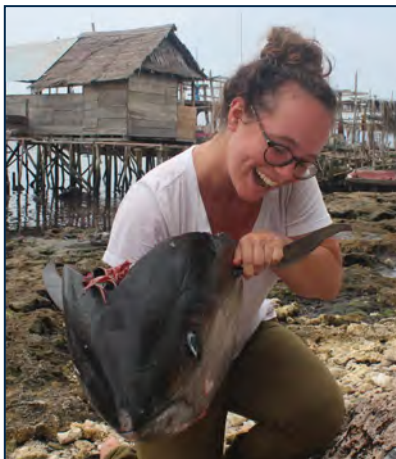


**Graduate Project:** [Spatial Protection for Porbeagle Sharks, \*Lamna nasus\*, in the Northwest Atlantic: The Road to Recovery?](#)

**Supervisor:** Megan Bailey (Marine Affairs Program, Dalhousie)

## LAURIE STARR

**Laurie** completed her internship with [Yayasan Masyarakat dan Perikanan Indonesia](#) (MDPI) under the supervision of Momo Kochen. The purpose of this internship was two-fold. Firstly, Laurie conducted a gap analysis on an existing tuna processing plant by comparing its current practices to how it aligned with the principles of the Marine Stewardship Council's (MSC) Chain of Custody (CoC) standard. The second internship component was to develop a pair of tools that MDPI could use for current and future partners to outline: (1) an overview of the supply chain and the necessary documentation within each node (i.e. fishermen, suppliers, processors, and market) and (2) recommendations on changes that should be made within the supply chain in order to better comply with the MSC CoC.



**Graduate Project:** [Blowing it out of the water: How breaking down illegal, unreported, and unregulated \(IUU\) fishing can contribute to its effective management in Indonesia using an area based approach](#)

**Supervisor:** Pramod Ganapathiraju (MCS & Fisheries Consultant, IUU Risk Intelligence and MMM alum) & Megan Bailey (Marine Affairs Program, Dalhousie)

## JENNY WEITZMAN

Peter Sykes of the [Aquaculture Association of Nova Scotia \(AANS\)](#) in Halifax, Nova Scotia hosted Jenny's internship this summer. She worked as an outreach assistant, and helped in the delivery of the AANS's public engagement and outreach events during the summer. During this internship, Jenny traveled throughout Nova Scotia to community events, festivals and educational events to inform the public and interested groups about aquaculture in the province. Through her internship, Jenny gained the opportunity to learn the perspectives of a range of groups, and interact with various aquaculture stakeholders. The resources and experiences provided by the AANS provided Jenny with valuable insights relevant to her research.

**Graduate Project:** [Assessing the potential of ecolabels to improve social acceptance within Nova Scotia's finfish aquaculture industry: A stakeholder approach](#)

**Supervisor:** Megan Bailey (Marine Affairs Program, Dalhousie)



## PETER WESSELS

**Peter** travelled to the Maldives to work under the supervision of Alice Miller with the [International Pole and Line Foundation](#) (IPNLF). IPNLF in collaboration with Ministry of Fisheries and Agriculture and the Marine Research Center in the Maldives is exploring social issues in tuna fisheries sustainability, and is turning its attention to the roles women have in one-by-one tuna supply chains. Peter spent his internship observing and interacting with people involved in the one-by-one tuna supply chain and had the opportunity to present his findings at the [6<sup>th</sup> annual Gender in Aquaculture and Fisheries conference](#) in Thailand.

**Graduate Project:** [Enhancing Small-Scale Fishing Communities Through the Advancement of Women's Participation in the Sustainable Livelihoods Framework](#)

**Supervisor:** Megan Bailey (Marine Affairs Program, Dalhousie)

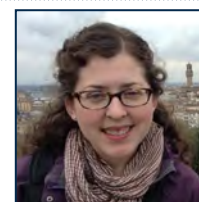
## GRADUATE PROJECTS OF PART-TIME STUDENTS

MAP would like to congratulate three MMM students that completed their degree on a part-time basis.

## ASHLEY DAVID

**Graduate Project:** [Marine microplastic and nanoplastic litter in Nova Scotia: Confronting the rising tide of plastics in our marine waters, coastlines and organisms.](#)

**Supervisor:** Peter Wells (Adjunct Professor, Marine Affairs Program).



## DENA RICHARDSON

**Graduate Project:** Increasing Supply Chain Security: The Requirement for RFID Technology on Containerized Cargo

**Supervisor:** Moira McConnell (Adjunct Professor, Marine Affairs Program)

## NICOLAS WINKLER

**Graduate Project:** [Diving Dangerously: Exploring human health & resource trade-offs of extreme dive profiles in a Caribbean dive fishery](#)

**Academic supervisor:** Claudio Aporta (Marine Affairs Program)

