2017 Annual report HTHE

BENEATH THE WAVES

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MISSION & VISION

MISSION

Beneath the Waves is dedicated to advancing the conservation of sharks and the habitats they occupy through cutting edge scientific research.

VISION

Oceans where sharks thrive in balanced ecosystems that promote biodiversity.

OVERVIEW

Beneath the Waves is devoted to increasing our understanding of sharks and creating evidence to inform their conservation.

Working with some of the world's leading marine biologists, Beneath the Waves executes timely and applied scientific research on sharks and the marine communities they occupy – from coral reefs to open ocean zones – using innovative tools and technologies.

Beneath the Waves partners with academic Institutions, local and international NGOs, policy makers, entrepreneurs, local community members, and engaged citizens interested in the future of our oceans.

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FROM THE CEO

2017 was another year of incredible progress for Beneath the Waves. This year served as a pivotal inflection point in the trajectory of our organization, setting forward from the previous year's decision to focus our efforts primarily on shark research. This year we saw massive results from this strategic decision, and I am proud that our model is proving to be productive, exciting, costeffective, and impactful.

One of the most exciting moments of 2017 was our participation in an innovative and high-profile collaboration with Sir Richard Branson and The Virgin Group in the British Virgin Islands. Together with philanthropists and entrepreneurs, we helped facilitate the sinking of the Kodiak Queen, a WWII vessel that will serve as an artificial reef to attract marine life. Our team brought the scientific expertise to this project, and are using innovative molecular techniques to track the recruitment of large predators to the reef. The project's success garnered worldwide acclaim and press, culminating with a piece in the New York Times.

Elsewhere in the Atlantic, we pushed ahead on a number of initiatives seeking to advance the conservation of sharks and their habitats. After a year of planning, we launched a partnership with Thayer Academy which provides hands-on marine research opportunities for high school students off Cape Cod, Massachusetts. This year we also hosted a number of marine science graduate students, who successfully completed their degrees and have moved on to new careers in science and education. Lastly, our important shark satellite tagging efforts have continued, and we spent over 20 days on the water tagging sharks in order to illuminate the threats they face from commercial fishing.

Finally, I am proud of our Board and network of advisors, who have been overseeing our sustained growth with the goals of transparency, credibility, and efficiency. Their dedication to these ideals have helped us get where we are today and allowed us to achieve a trusted seal of approval and rating on GuideStar. I am humbled by the trust we receive from our partners and supporters – their belief in us fuels our determination to create a more sustainable future for our oceans.

With gratitude,

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Austin Gallagher, PhD CEO & CHIEF SCIENTIST

BOARD & STAFF

BOARD OF DIRECTORS

- Austin Gallagher, PhD
- Rosemary Mann
- Malik Adunni
- Erica Staaterman, PhD
- Steve Feron
- Chad Perlyn, MD, PhD
- Graham Nelson

ADVISORY BOARD

- James Sternlicht
- Jason Halvorsen
- Elisabeth Fullerton

SCIENTIFIC ADVISORY BOARD

- Simon Brandl, PhD
- Steven Cooke, PhD
- Neil Hammerschlag, PhD
- Nigel Hussey, PhD
- David Jacoby, PhD
- Yannis Papastamatiou, PhD

STAFF

SCIENTIFIC RESEARCH

- Austin Gallagher, PhD, Chief Scientist
- Christine de Silva, Manager of Field Operations
- Connor Benson, Research Assistant
- Cindy Gonzalez, Research Assistant
- Lindsay Phenix, Research Assistant
- Brendan Shea, Research Assistant
- Oliver Shipley, Research Assistant
- Enrique Quintero, Marine Technician

COMMUNICATIONS

- Sami Kattan, Director of Digital Media
- Sam Valentine, Director of Marketing
- Diego Camejo, Digital Media Producer

ACTIVE RESEARCH PARTNERS & COLLABORATORS

- Adam Barnett, PhD, James Cook University
- Brennan Phillips, PhD, University of Rhode Island
- Edd Brooks, PhD, Cape Eleuthera Institute/The Island School
- Rachel Skubel, University of Miami
- Duncan Irschick, PhD, UMass Amherst
- James Sulikowski, PhD, University of New England
- Joe Romeiro, Pelagic Expeditions / Atlantic White Shark Conservancy
- Evan Byrnes, Murdoch University
- Alex Wilson, PhD, University of Sydney
- Jodie Rummer, PhD, James Cook University
- Judith Bakker, PhD, University of Salford
- Stefano Mariani, PhD, University of Salford
- Heidi Pethybridge, PhD, CSIRO
- Charlie Huveneers, PhD, Flinders University
- Tristan Guttridge, PhD, Bimini Biological Field Station
- Andy Danylchuk, PhD, UMass Amherst
- Brian Raymond, Pelagic Expeditions
- Hannah Calich, University of Western Australia
- Peter Trull, Wild Cape Cod
- Susan Finnegan, Cape Cod Museum of Natural History
- Don Donovan, Thayer Academy
- Susana Caballero, PhD, University of Los Andes
- Tom Jackson, NOAA
- Ashwin Bhandiwad, PhD, NIH

OUR IMPACT

We measure our impact on the oceans in a variety of ways – from our success in the field, to our outputs, and our ability to educate and raise awareness. This year, we were able to accomplish the following: Graduate Students Supported

Active Projects

MILLION Media Impressions from Press

> 212 Fish Tagged & Released



Social Media Engagement



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Social Media Followers









194

Hours of Research Video Recorded



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PROGRAM FOCUS: ATLANTIC OCEAN INITIATIVE

After much planning and coordination, this year we were able to launch a new focal area for our greater Atlantic-wide marine research program. This initiative seeks to advance our understanding of the biology of sharks and the role they play in a variety of important ecosystems. A secondary goal is to provide hands-on research and educational experiences for aspiring marine biologists and high-school students.

Therefore, we started a research program in the estuaries, bays, and coastal ocean habitats of Cape Cod, Massachusetts. Specifically, we explored whether white sharks and seals affect the physiology and baseline stress levels in economically-important prey fish such as striped bass.

Throughout the course of the summer, we were able to collect blood samples from over 200 fish from the outer Cape, from areas of high and low white shark abundance. We were also able to foster collaborations with a number of stakeholders including recreational anglers and Pleasant Bay Community Boating.

Early results indicate that there may be subtle differences in fish stress levels between areas with high and low predator abundance, suggesting that sharks are important in shaping temperate marine ecosystems.

Part of our program's launch included working with a group of 15 highschool seniors from Thayer Academy in Braintree, Massachusetts, along with their science department chair and teacher, Don Donovan. For a period of six weeks, these students helped capture and sample fish for the project, learned how to conduct rigorous and applied scientific research, and how to communicate the importance of their findings to the greater public.

We are very excited about the seeds we have planted on Cape Cod. Future efforts will include an expanded set of research questions on a greater number of species, and more opportunities for empowering young students. We are especially grateful for Peter and Michelle de Silva for their generosity and assistance throughout this program.









PROGRAM FOCUS: SPYING ON SHARKS

Studying sharks is a very challenging endeavor. These animals are large, elusive, and highly mobile. While many of our programs focus on catching and tagging large sharks, sometimes less invasive methods are preferred for answering certain questions.

A commonly-used technique for recording the behaviors and presence of marine species is the use of underwater camera rigs. These rigs, known as BRUVs (Baited Remote Underwater Videos), are a great way to spy on sharks with minimal disturbance to the ecosystem. In addition, it is possible to observe the way that other species respond to the presence of sharks and other large predators.

This year, one of our supported graduate students, Lindsay Phenix, conducted a year-long study using BRUVs in the coral reefs off Miami, Florida. Lindsay, who completed her MS degree through Northeastern University, asked whether the abundance and behavior of reef fish changed when large sharks were seen on camera. Lindsay collected a total of 194 hours of underwater footage to support her study.

Her findings indicated that habitat differences, rather than shark presence, played a larger role in shaping reef fish communities. However, she also found that fish typically exhibited anti-predator behaviors when sharks were nearby.

We also made an exciting first-of-its-kind discovery during this research: an endangered smalltooth sawfish was recorded on video for the first time in Biscayne Bay (Miami, Florida)! We are excited to be able to contribute an important data point that will support future conservation efforts in this region. All of these findings are currently in preparation for publication.







PROGRAM FOCUS: **BVI ART REEF**

The Caribbean is known as one of the top dive destinations in the world. However, many of its coral reefs are in decline and its top predators are overfished. In order to improve the vitality of threatened ecosystems, the conservation community is looking for innovative solutions. Artificial reefs, which are man-made structures that attract marine life, can be used to help restore marine habitats.

Through a partnership with the Virgin Group and Sir Richard Branson, Beneath the Waves linked up with a group of highimpact entrepreneurs, philanthropists, and artists to create a one of a kind artificial reef in the British Virgin Islands. The team restored a derelict WWII vessel, created stunning marine-themed art installations on the boat, and sunk her in 60 feet of water off Virgin Gorda where she will remain forever.

Beneath the Waves' researchers are using an innovative approach to track how the BVI Art Reef rebuilds the local predator populations over time. Using a technique known as environmental DNA (eDNA), we sample seawater at the dive site every month to obtain a molecular "snapshot" of which species have visited the area. We are focusing our search on overfished species such as grouper and sharks and we will be tracking the restorative power of this reef for the next several years.

Results are already showing a high level of recruitment for many fish species in the first few months. This project was covered by the New York Times and over two dozen other news outlets.







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ROSE MANN

WHERE DOES YOUR PASSION FOR THE OCEAN COME FROM?

The ocean is the life force of our planet. It is the heart that beats for all species on earth. It only takes a brief moment by the sea to feel its magnitude and fragility. Yet, it is too often taken for granted, abused and neglected. There is a disconnect between the human population and the need to conserve the ocean. It is more than a political topic or belief; it is a matter of life and death for all living species. I have come to understand people will only protect and conserve the things they have learned to love and understand. Therefore, it is our responsibility to lead by example. I am devoted to saving our oceans, not for the sake of glory, but for the love and respect of our home and our survival. An ocean so strong and magnificent demands to be noticed. One person's actions may be just a drop in the sea, but all together our drops become an ocean and change becomes inevitable.

WHAT DO YOU ENJOY MOST ABOUT YOUR JOB?

I fully support the mission and vision of Beneath the Waves. Protecting sharks is my personal passion and a world without them would have devastating effects on ocean health as well as human well-being. Our laser focus on producing the science needed to protect the most threatened species on the planet and then communicating these outcomes to the world is what drives my commitment to Beneath the Waves.



PERSONNEL SPOTLIGHTS: ROSE MANN & CHRISTINE DE SILVA



CHRISTINE DE SILVA

WHERE DOES YOUR PASSION FOR THE OCEAN COME FROM?

As a child, I was lucky enough to grow up near the water. My parents would take me down to the beach and I could spend hours staring at the small animals. At nine, I began spending my summers sailing on Cape Cod which gave me a way to connect even more closely with the ocean. I began to understand the relationship between the moon, tides, winds, and waves and synced my life to their movements. The more time I spent by the sea, the more I began to understand its importance. Today, the ocean is a source for adventure, food, and both physical and mental health for me and I want to ensure that our oceans are healthy and bountiful for years to come.

WHAT DO YOU ENJOY MOST ABOUT YOUR JOB?

I love that every day poses a different challenge. Our research is subject to the tides and unpredictable weather, which forces me to gain a deeper understanding of the ocean because conditions can change quickly. Being able to combine my knowledge of the seas and making informed decisions on the fly is very rewarding – and I am always learning new things. Every day on the water gives me an even greater appreciation for the ocean.

PUBLICATIONS & PRESS

SCIENTIFIC PUBLICATIONS

- Gallagher, A.J., Skubel, R.A., Pethybridge, H.R. and Hammerschlag, N. 2017. Energy metabolism in mobile, wild-sampled sharks inferred by plasma lipids. *Conservation Physiology*, *5*(1).
- Gallagher, A.J., Creel, S., Wilson, R.P. and Cooke, S.J. 2017. Energy landscapes and the landscape of fear. Trends in Ecology & Evolution, 32(2), pp. 88-96.
- Cooke, S.J., Gallagher, A.J., Sopinka, N.M., Nguyen, V.M., Skubel, R.A., Hammerschlag, N., Boon, S., Young, N. and Danylchuk, A.J. 2017. Considerations for effective science communication. *FACETS*, 1, pp. 233-248.
- Hammerschlag, N. and Gallagher, A.J. 2017. Extinction risk and conservation of the earth's national animal symbols. *BioScience*, 67(8), pp. 744-749.
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- Gallagher, A.J., Shiffman, D.S., Byrnes, E.E., Hammerschlag-Peyer, C.M. and Hammerschlag, N. 2017. Patterns of resource use and isotopic niche overlap among three species of sharks occurring within a protected subtropical estuary. *Aquatic Ecology*, 51(3), pp. 435-448.
- Twardek, W.M., Peiman, K.S., Gallagher, A.J. and Cooke, S.J. 2017. Fido, Fluffy, and wildlife conservation: The environmental consequences of domesticated animals. *Environmental Reviews*, 25(4), pp. 381-395.
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- Jerome, J.M., Gallagher, A.J., Cooke, S.J., Hammerschlag, N. 2017. Integrating reflexes with physiological measures to evaluate coastal shark stress response to capture. *ICES Journal of Marine Science*, 75(2), pp. 796-804.

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 Conservation potential of apex predator tourism. *Biological Conservation*, 215, pp. 132-141.
- Hammerschlag, N., Skubel, R.A., Calich, H., Nelson, E.R., Shiffman, D.S., Wester, J., Macdonald, C.C., Cain, S., Jennings, L., Enchelmaier, A. and Gallagher, A.J., 2017. Nocturnal and crepuscular behavior in elasmobranchs: a review of movement, habitat use, foraging, and reproduction in the dark. *Bulletin of Marine Science*, 93(2), pp. 355-374.

MAJOR PRESS

- New York Times
- Huffington Post
- The Weather Network
- VICE
- Billboard
- National Geographic
- National Resources Defense Council
- The Verge
- Hakai Magazine
- EarthSky

MAJOR ACTIVATIONS

- Keynote (Dr. Austin Gallagher) at Oceanic Global event in Ibiza, Spain
- Activation at New York City Broadway Production Goldfish from Pluto

MAJOR SUPPORTERS & PARTNERS

PRIMARY PHILANTHROPIC SUPPORTERS AND SPONSORS

Lush

- The Sternlicht Family Foundation
- Oceana
- Rock the Ocean Foundation
- The Elisabeth Fullerton Foundation
- Jerome A. Yavitz Family Foundation
- Paul Hastings
- Maverick 1000
- Virgin Unite
- Pelagic
- Tempo

MAJOR PARTNERS

- Northeastern University
- Thayer Academy
- Unite BVI
- University of Miami Shark Research and Conservation Lab
- International Seakeeper's Society
- Oceanic Global
- Sunchaser Scuba
- Nomad Creative
- Artec Media
- Google/Skytruth
- Pleasant Bay Community Boating
- Stuart Cove's Bahamas
- Wildlife Computers
- FACT Array
- Forbes Nonprofit Council

FINANCIALS

REVENUE

TOTAL REVENUE	\$441,259
GRANTS (6.8%)	\$30,000
DONATIONS (93.2%)	\$411,259



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SHARK RESEARCH



PHOTO CREDITS

Sami Kattan Diego Camejo Josh Liberman Austin Gallagher James Sternlicht



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Beneath the Waves is a global NGO working to conserve sharks and the habitats they occupy through cuttingedge scientific research.