

# IMPACT REPORT 2021



## BENEATH THE WAVES





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- An underwater photograph serves as the background for the table of contents. On the left, a large shark swims towards the left. On the right, a scuba diver is positioned, holding a large video camera on a rig. The water is a deep blue, and the sandy ocean floor is visible at the bottom.
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# BENEATH THE WAVES



## PHOTO CREDITS

- Sami Kattan
- Wilson Haynes
- Austin Gallagher
- Diego Camejo
- Christine de Silva
- Filipe DeAndrade



# MISSION

Beneath the Waves is dedicated to promoting ocean health and using science and technology to catalyze ocean policy, with a focus on shark conservation and marine protected areas. Our research creates the conservation evidence needed to inform broad-scale and region-specific ocean policies, while also providing solutions to new or emerging conservation challenges.





## APPROACH

Beneath the Waves has made a strategic decision to focus its programs and resources in the following timely conservation areas:

### MARINE PROTECTED AREAS

Collecting baseline data on the importance of marine habitats and how keystone species use them, and working with governments and partners to integrate this information into legislation to advance ocean protection.

### THREATENED SPECIES

Filling critical knowledge gaps to bolster arguments for local, national, and international conservation plans, and management for sharks and their prey.

### DEEP-SEA CONSERVATION

Mapping biodiversity throughout the largest ecosystem on our planet ahead of harmful extractive activities.

### BLUE CARBON

Collecting novel data on the marine life and habitats that provide critical ecosystem services for regulating global climate.

## IMPACT GOAL

We will be successful if the following is accomplished on the species and regions in which we work:

- ▶ Increased establishment of marine protected areas and reserves
- ▶ Sustaining and strengthening of existing protected areas
- ▶ Improved conservation status and sustainable management of marine resources
- ▶ Increased production of science to accelerate discovery in our oceans



## BENEATH THE WAVES

Beneath the Waves is a nonprofit, tax-exempt charitable organization under Section 501(c)(3) of the Internal Revenue Code.

## FROM THE C.E.O.

**2021 was a year characterized by strategic growth and elevated impact, driven largely by the addition of several new team members and our new research vessel, the *R/V Tigress*. With these key pieces in place, we were able to set out into new waters and move forward on executing our mission with increased confidence and energy.**

This year, we began work on our most ambitious project to date: the refitting and launching of a major research vessel that we could call our own. After months of ideation and development, in November we took delivery of *R/V Tigress*, a 51-foot converted trawling yacht, which would provide a floating platform for our science, education, and storytelling. Out of the gate, the vessel completed three major expeditions, successfully collecting new data to fuel our Bahamas programs. In addition, our core team significantly expanded, adding to our senior leadership team with full-time staff to manage research programs, operations, and our media.

Our research continues to produce eye-opening and relevant scientific outputs. This year, our team published several impactful peer-reviewed publications, none timelier than an evaluation of the benefits of large marine protected areas for sharks, a first of its kind, which utilized two years of shark tagging and monitoring data from our Bahamas program. We also formalized our interest and expertise in nature-based solutions to climate change with a new research program focusing on blue carbon, and began expansive deep-sea work in Bermuda and Cayman.

We continue to build major capacity for affecting policy change. This year, I was joined by members of our core team as we were invited to present on our climate solutions program to two heads of state and their respective cabinets. We have connected directly with Prime Minister Philip Davis of The Bahamas, as well as Deputy Prime Minister Chester Cooper, and several key Ministers spanning Finance, Education, and Environment.



We also briefed President Luis Abinader of the Dominican Republic, and had several productive conversations with key Ministries of Tourism and Development. Our work is paving the way for the creation of transformational programs to protect national blue carbon resources, which will also generate long-term revenues through carbon credits. Domestically, our team was also asked to provide expert opinion on blue carbon to leaders from US Congress, and to comment on legislation drafted by the House subcommittees on environment. These policy discussions are a testament to our ability to drive conservation outcomes that are authentic and tractable.

Beneath the Waves is truly growing stronger with each passing day, as is our capacity to educate and motivate those around us. Throughout our policy briefings, staff and Board meetings, and time spent in the field with our team and community stakeholders – a common theme and shared culture have emerged: it is all about people. I am deeply grateful to those who support us – from the many who have been with us for years, to those who are just joining us today with new energy and excitement. The view from mission control has never been this exciting.

Sincerely,

Austin Gallagher, PhD **CEO**

# MEET THE TEAM



SCAN QR CODE TO MEET THE TEAM & READ BIOS

## CORE TEAM

Austin Gallagher, PhD  
**CEO**

Jamie Fitzgerald  
**MANAGING DIRECTOR**

Sami Kattan  
**DIGITAL MEDIA DIRECTOR**

Wells Howe  
**PROGRAM MANAGER, BLUE CARBON**

David Harris  
**PROJECT MANAGER, OPERATIONS**

Christine de Silva  
**PROGRAM MANAGER, NEW ENGLAND**

## SCIENCE & POLICY ADVISORY BOARD

Carlos Duarte, PhD  
Rashid Sumaila, PhD

Diva Amon, PhD  
Tadzio Bervoets

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Jeff King

Wendy Benchley  
Steve Feron

Jeffrey Pankey  
Marko Dimitrijević

Malik Adunni  
Austin Gallagher, PhD

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Daniel Hettwer

Mike Hudson  
Joe Romeiro  
Cristina Mittermeier  
Paul Nicklen

## SCIENCE, OPERATIONS & MEDIA

Scotty Gray, **CAPTAIN**  
Brennan Phillips, PhD, **SENIOR RESEARCH ASSOCIATE**  
Nicholas Payne, PhD, **SENIOR RESEARCH ASSOCIATE**  
Camrin Braun, PhD, **SENIOR RESEARCH ASSOCIATE**  
Judith Bakker, PhD, **SENIOR RESEARCH ASSOCIATE**  
Oliver Shipley, PhD, **SENIOR RESEARCH ASSOCIATE**  
Brendan Shea, MSc, **RESEARCH ASSOCIATE**

Cali Capela, **RESEARCH ASSISTANT**  
Beckah Campbell, **RESEARCH ASSISTANT**  
Alyssa Dorfman, **RESEARCH ASSISTANT**  
Enrique Quintero, **MARINE TECHNICIAN**  
Diego Camejo, **MANAGER OF DIGITAL PROJECTS**  
Wilson Haynes, **PHOTOGRAPHER**



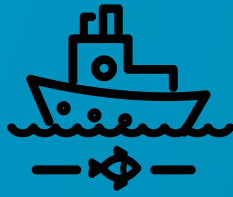
## BENEATH THE WAVES: BY THE NUMBERS

### MARINE RESEARCH



**13**

MAJOR RESEARCH  
EXPEDITIONS COMPLETED



**149**

DAYS ON THE WATER  
DOING RESEARCH



**18**

PEER-REVIEWED  
PAPERS PUBLISHED



**500,000**

KM<sup>2</sup> OF EXISTING  
PROTECTED AREAS  
SURVEYED

### POLICY



**2**

HEADS OF STATE BRIEFED

**2**

SUBCOMMITTEES FROM  
U.S. CONGRESS BRIEFED

**90,000**

KM<sup>2</sup> OF NEW  
OCEAN PROPOSED  
FOR PROTECTION



**2**

PIECES OF  
LEGISLATION  
ADVANCED

**45**

DELEGATES  
INFORMED &  
MENTORED FROM  
6 COUNTRIES



**10**

MINISTRIES ENGAGED



## PROGRAM CAPACITY



**1**

RESEARCH  
VESSEL  
LAUNCHED



**1**

SCIENCE  
LABORATORY  
BUILT



**2**

MAJOR  
INSTITUTIONAL  
GRANTS WON



**5**

PARTNERSHIPS  
WITH WORLD-CLASS  
INSTITUTIONS



**10**

STUDENT INTERNS  
MENTORED DURING  
SUMMER PROGRAMS

## GLOBAL AWARENESS



**3 MILLION**

IMPRESSIONS  
FROM OWNED  
SOCIAL MEDIA



**30,000**

PEOPLE REACHED  
PER WEEK



**30**

MAJOR PRESS  
ARTICLES PUBLISHED  
FEATURING OUR WORK



**4**

SPEAKING  
ENGAGEMENTS  
WORLDWIDE

**17**

VIDEO PIECES  
PRODUCED  
& DEPLOYED



**3**

PRODUCTIONS FEATURING  
OUR WORK, STREAMED  
TO MILLIONS

# OUR IMPACT: SUMMARY

We measure our impact in a variety of ways—from our time in the field, our output generation, outcomes such as how we impact or inform policy, and our ability to reach the masses with our work.

## CATALYZING OCEAN POLICY:

Beneath the Waves engaged significantly with policymakers in 2021, at the local and international level. We are proud of the considerable impact these engagements have brought, recognizing that our NGO has entered a new arena in the world of marine conservation.



### UNITED STATES OF AMERICA

Beneath the Waves presented and was consulted on numerous occasions regarding marine policy and blue carbon habitats by members of the Congressional Oceans Caucus. The Oceans Caucus is a bipartisan caucus working to increase awareness and find common ground in responding to issues facing the oceans and coasts.







## CARIBBEAN REGION ▲

Beneath the Waves continues to have a strong presence in The Bahamas, where we met with multiple cabinet-level officials throughout 2021 to provide expertise on marine science and education. In late 2021, our team met with the Office of the Prime Minister regarding marine protections for critical Bahamian habitat and to share updates on our ongoing research in the country.

Beneath the Waves was invited to the Dominican Republic this year, to present on emerging opportunities for marine conservation and climate change resilience to President Luis Abinader, the Senate, and the Commission on Foreign Relations and International Cooperation.

This summer, Beneath the Waves joined the Dutch Caribbean Nature Alliance in Saint Maarten and Saba to provide in-field training, guidance and support in a new collaborative project focused on expanding protections of the Yarari Shark Sanctuary. This ongoing work seeks to determine the role the marine ecosystems of the Dutch Caribbean play in the life-cycle of tiger sharks in the wider Caribbean region.

Through the creation of the Caribbean Shark Sanctuary, BTW has engaged with marine park managers and government officials from over a dozen countries in the Greater Caribbean region, as well as international leaders from UN groups. These conversations on shark biodiversity and abundance, research practices, and data sharing are critical for actualizing large scale marine conservation efforts.

## ◀ GLOBAL

Beneath the Waves presented at the Blue Carbon Conference in Edinburgh, during COP26 (2021 United Nations Climate Change Conference), on the importance of blue carbon habitats and their connectivity with large marine megafauna, ecosystem services and potential climate solutions.

## DEVELOPING VALUABLE CONSERVATION RELATIONSHIPS

This year, BTW was awarded two highly competitive, multi-year grants from the Darwin Initiative to advance our marine conservation research in the Caribbean. This funding supports collaborative projects in Bermuda and the Cayman Islands, working with local stakeholders, universities, scientists and governments to provide baseline data on the habitats and biodiversity of the respective countries' deep-sea regions. These discoveries will inform regional policy on protection and management of deep-sea zones.

We are honored to be supported by many new funders this year, including the Sant Family, the Code Blue Foundation, the Pictet Foundation, the Towle Ocean Conservation Foundation, World Wildlife Fund of the Netherlands, the Coral Collective and 10% for the Ocean. These grants will provide BTW with capital, mentorship, and network connectivity for our marine protected area research and impact efforts in The Atlantic Ocean and Caribbean.

## INCREASED GLOBAL AWARENESS THROUGH EDUCATION

### Press Outputs:

Over 30 major articles published about our research from international news outlets, in print and online.

### Owned Media:

Social media posts on Instagram reached ~30,000 accounts per week, resulting in ~3 million impressions per year.

### Speaking Engagements:

Members of our team delivered dozens of presentations and keynote lectures to universities and groups around the world, including hosting global panels with The Explorer's Club, The Oxygen Project, and at the United Nations Climate Change Conference (COP26) in Edinburgh, Scotland.

### Film & TV:

Our research was once again featured on Discovery Channel's Shark Week, this year airing both on Discovery and streaming on Discovery+. These shows aired in summer 2021 to millions of viewers, providing significant exposure for education around our work to the general public.

*Tiger Queen* (July 2021), *Dr. Pimple Popper Pops*  
*Shark Week* (July 2021), *Brad Paisley's Shark*  
*Country* (July 2021)



[youtube.com/beneaththewaves](https://youtube.com/beneaththewaves)

In April 2021, BTW launched a web series exclusively on our **YouTube Channel** documenting our ongoing research in the Turks & Caicos Islands. This mini-series garnered international attention, and an invitation to the Turks & Caicos International Film Festival.



### ENGAGING THE PRIVATE SECTOR

We were proud to continue our partnership with coastal apparel brand Southern Tide with our first full line of co-branded clothing to support general research programs. Southern Tide renewed and increased their financial contribution to this partnership in October 2021, committing to another two years of showcasing and supporting Beneath the Waves. The new agreement includes additional exposure for the BTW team and network.

This year, Beneath the Waves partnered with eco-conscious air travel company Verijet. By donating the use of their Cirrus aircrafts, Verijet is powering our research in The Bahamas by increasing our team's travel efficiencies, reducing our carbon footprint, and providing critical support for our conservation research in the movement of our scientists and scientific equipment. Verijet sponsored BTW's expansion to the Dominican Republic, a significant milestone in BTW's commitment to impacting marine policy in the Caribbean.

Hexagon AB, a global leader in digital reality solutions, is one of our newest technology partners. Their team at R-evolution, launched to reinvent and empower how industry addresses complex environmental risk, joined us in The Bahamas in the pilot of an effort to map the threatened seagrass meadows of the Caribbean. R-evolution is leveraging Hexagon's airborne bathymetric LiDAR technologies to detect, map and capture critical details about this vital habitat.

Our partnership with Grand Isle Resort in the Exumas reached new depths, as we officially launched our joint ecotourism venture in December 2021. Together we are providing guests the unique opportunity to join our science team and participate in a day of shark research. This donation-based excursion directly supports our science and conservation efforts in The Bahamas, particularly Exuma Sound. We have already seen tremendous success through the pilot launch of this program.

## FEATURE FOCUS:

# R/V TIGRESS



This year, our newest team member came onboard in the biggest way possible. With the incredible support from a key supporter and donor, we were able to secure a research vessel in early 2021 to become our own: **the R/V Tigress**. Originally a 1980s trawling yacht, over several months we refitted and upgraded the boat into a fully-customized, state-of-the-art expedition yacht, with support from a team of subcontractors and under the guidance of Project Manager David Harris.

With state-of-the-art navigation systems from Garmin, the newest in marine lighting from Lumitec, a dive compressor, and functionality as an onboard research lab and media studio, the *Tigress* will revolutionize the way we do our work. And, with bunks for 6, a kitchen, salon, full bathroom/shower, and expanded deck for marine operations, *Tigress* will take our team to new places, allowing us to explore remote areas and key research sites alike.

We officially launched *Tigress* in November 2021, where she powered four major expeditions through the end of the year, culminating the most successful year of fieldwork yet for our organization and expanding upon some of our most successful programs.

## 2021 Highlights:

- 1** On her maiden voyage, we explored remote reaches of the Tongue of the Ocean and the Exuma Sound, on a deep-sea expedition with the National Geographic Society, also launching their new newest deep-sea exploration program which will continue around the globe in 2022.
- 2** Working alongside collaborator Dr. Carlos Duarte and his team from King Abdullah University of Science and Technology, the *R/V Tigress* was stationed for a week in the southern Exumas to conduct one of our most exciting expeditions to date: surveying seagrass meadows and monitoring the sharks - the same ones which keep leading us to these incredible blue carbon spaces.
- 3** Surveying Little Bahama Banks from the sea while partners from Hexagon A/B's R-evolution joined us in the skies in December 2021. Our team, with assistance from local divers, took sediment cores and completed scuba surveys while Hexagon mapped our transects from above using LiDAR technology.
- 4** We returned to Grand Isle Resort & Residences to formally begin our shark conservation and ecotourism program, where guests are able to join our team to observe real science in action in the Exuma Cays. This experience is a first-of-its-kind, and seeks to provide valuable education on and support for our work.







## PROGRAM FOCUS: **BLUE CARBON**

**Blue Carbon** is a term for all of the carbon dioxide that is pulled out of the earth's atmosphere and stored in marine ecosystems. Blue Carbon ecosystems sequester approximately 4 times more greenhouse gasses than their terrestrial counterparts—making areas like seagrass meadows a hotspot for climate change mitigation. A strategic global climate asset, these habitats are among the most productive natural climate solutions on earth at fighting climate change.

In 2021, blue carbon became one of our biggest research focuses, and brought with it many impressive partnerships and collaborators. With hands-on training from researchers at Massachusetts Institute of Technology and the Environmental Protection Agency, we began sampling seagrass habitat off the coast of New England. Under guidance from leading marine biologist Dr. Carlos Duarte, Science and Policy Advisor to BTW (he also created the term “blue carbon”) scaled and refined our own methodology, beginning critical seagrass surveys along the Little and Great Bahama Banks and late 2021.









**PROGRAM FOCUS:**  
**BLUE CARBON** (CONT'D)



Our seagrass research seeks to map these habitats, quantify their total organic carbon and biodiversity, which will greatly advance our understanding of the capacity of these ecosystems to serve as nature-based solutions to climate change.

By working collaboratively with the Office of the Prime Minister and Government of The Bahamas, we will be greatly scaling-up this research, while also directly catalyzing policies to protect these areas.

This research in the Bahamas is supported by the Pictet Foundation, the Sant Foundation, and Disney Conservation Foundation, with operational support from Hexagon A/B, Neal Watson's Scuba Center, and Grand Isle Resort & Residences. In 2022, our blue carbon work will begin including mangrove habitats, and will see a concomitant expansion to many of our other primary and network-based study sites throughout the Caribbean.



## GET TO KNOW: **WELLS HOWE** BLUE CARBON PROGRAM MANAGER



### **Favorite story in the field with Hexagon:**

This past December we were lucky enough to experience the calmest conditions I have ever seen on the water in my life. The entirety of the Little Bahama Bank was so flat calm that the clouds reflecting off the water while underway made it hard to tell where the horizon was. There was a brief moment in time where all of our fieldwork overlapped: we had a device measuring water reflectance/quality off the port side of the boat, David and I were taking a sediment core off the stern of the boat, Alonzo was swimming the A-Walker off the starboard side of the boat mapping a seagrass meadow through underwater imagery, and I could see the BTW/Hexagon plane pass by directly overhead of Tigress, deploying its aerial LiDAR technology. This moment beautifully tied together the amount of cooperation, work, and people's time being deployed to protect our natural world through the partnership.



### **Your favorite moment in the field with KAUST:**

Dr. Carlos Duarte, the most published and influential scientific mind on the oceans, was the most welcoming and humble person I've had the chance to interact with on an expedition. On our 1st sediment core with KAUST in the field, while the team was racing to complete tasks underwater to impress him, he paused after measuring the compaction of a core (we use red lipstick on the acrylic tubes) and applied lipstick around his regulator before allowing for the core to be removed from the seafloor. As the team came to the surface everyone broke out laughing and high-fiving each other which set the stage and attitudes for the remainder of the week-long expedition. Carlos immediately made all collaborators feel equal and at ease completing the important work we were doing without stress.



### **Proudest moment from working with Thayer Interns:**

Seeing the students' faces when we told them that the eDNA discovery from one of our eelgrass meadow study sites in MA had detected tiger shark DNA and that we would be including this story of interconnected Blue Carbon habitats in a presentation at COP26. They immediately took pride in ownership and understood the value of all their hard work in the field.

### **Biggest success of 2021:**

Beyond The Inventory Presentation at COP26 around our partnership with tiger sharks leading to the discovery of the largest seagrass meadow on earth.

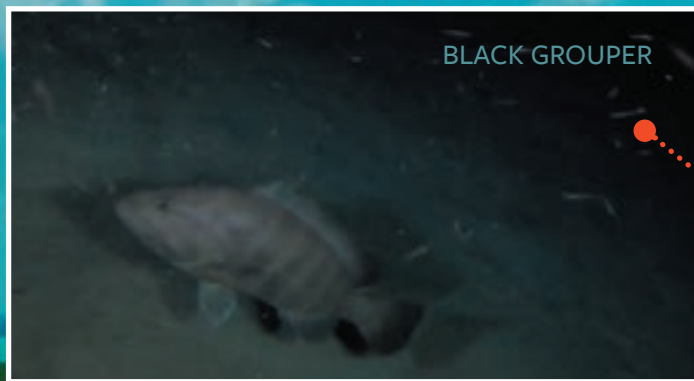
### **What you're looking forward to in 2022:**

Seeing our Blue Carbon collaborations and 2021 research guide conservation success stories that turn into tangible impacts on the communities where we work!

## DISCOVERY UPDATE: DEEP SEA DISCOVERIES

**In 2021, our deep-sea research spanned from the depths of Turks and Caicos, The Bahamas, to the Northeast Canyons and Seamounts of the eastern North Atlantic.**

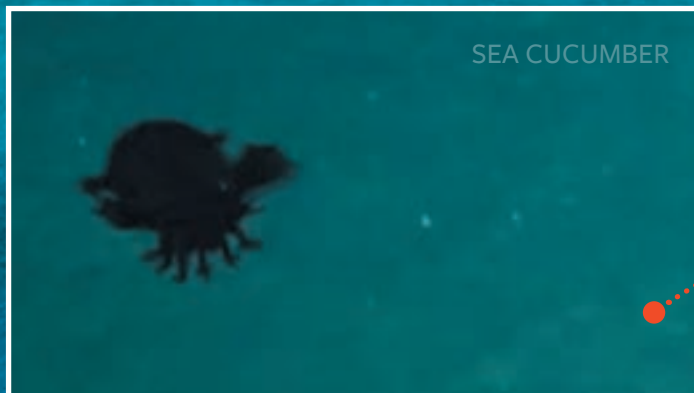
Our custom-built deep-sea drop-camera rigs - initially designed by Dr. Brennan Phillips - are dropped over the side to record high-definition video for multiple hours at depths up to 3,000 meters (10,000 feet). Using GoPro cameras and an LED-light system, we are able to spy on the biodiversity of remote and extreme environments like never before, driving thrilling new discoveries in underexplored and never-before-seen reaches of the world beneath the waves.



BLACK GROUPEr



YELLOW MORAY EEL



SEA CUCUMBER



MATING IN SIXGILL SHARKS



Our technology helps to fill critical knowledge gaps about our deep ocean. With each deep-sea expedition, we are learning more about the sharks, marine life, and habitats that we study. This year, we observed new interactions and depth range extensions for multiple species that were previously undescribed in the scientific literature.

## IN 2021, OUR DEEP-SEA HIGHLIGHTS INCLUDED:

- **BLACK GROUPER @ 500 meters**

📍 TURKS & CAICOS ISLANDS

A conservation success story, grouper in the Caribbean were nearly fished to extinction. Now, our team has documented them at the deepest these fish have ever been seen.

- **YELLOW MORAY EEL @ 450 meters**

📍 TURKS & CAICOS ISLANDS

Depth range extension for the species.

- **Deep-Sea Swimming SEA CUCUMBER @ 1,000 meters**

📍 THE BAHAMAS

Due to its unique appearance, this deep-sea swimmer has a variety of interesting common names: the headless chicken fish, the headless chicken monster, and the Spanish dancer. A beautiful alien of the deep.

- **Evidence of Mating in SIXGILL SHARKS @ 1,000 meters**

📍 THE BAHAMAS

Our team identified the presence of fresh mating scars on a large female, estimated to be almost 15 feet long. This is the first video evidence of mating behavior in any deep-sea shark.

We anticipate that our use of this technology will continue taking our team to new depths, with the real possibility of describing new species or identifying new biodiversity hotspots.



## PARTNER FOCUS: THAYER ACADEMY

**Thanks to a generous donation from the graduating class of 2020, Beneath the Waves now has a dedicated research laboratory on Thayer Academy's campus in Braintree, Massachusetts.**

The newly dedicated space is equipped with state-of-the-art instruments and diagnostic machines for storing, processing, and analyzing our samples, as well as a full media suite. In 2021, we also established a collaborative education program with Thayer Academy that enabled us to support a team of high school and college level interns during our summer research out of New England, exponentially increasing our scientific capacity.

Our Thayer partnership demonstrates our commitment to inspire and motivate a new generation of marine biologists. Our interns assisted with environmental DNA sampling and lab assays, helped deploy and analyze shallow and deep-sea BRUVs (remote underwater camera stations), tagged multiple species of sharks, conducted aerial drone surveys, sediment cores, and completed biodiversity sampling at our seagrass field sites.

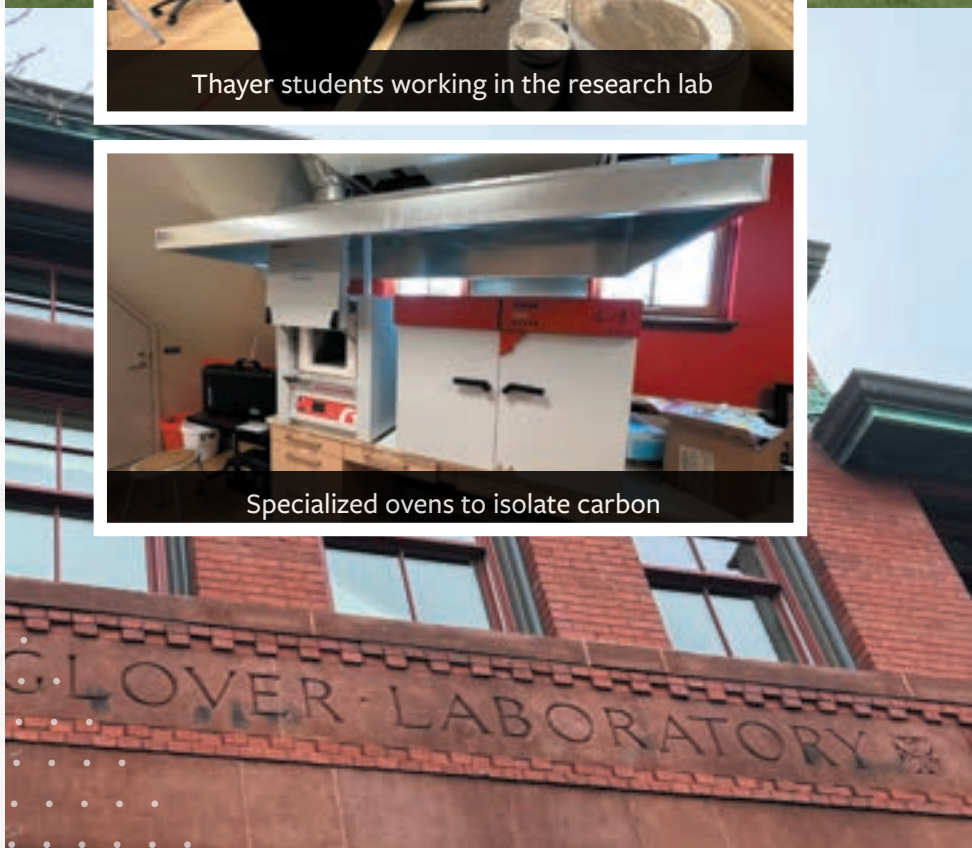
The data collected during the 2021 summer field season is included in the academic curricula across multiple departments at Thayer Academy, and high school students enrolled in marine biology coursework will remain actively working with our team in the lab. We are extremely grateful to Thayer Science Chair and long-time BTW friend and Advisor Don Donovan, who has helped facilitate all aspects of this growing program at Thayer. We're looking forward to future programs and using this space to generate many new discoveries for ocean science.



Thayer students working in the research lab



Specialized ovens to isolate carbon





# GET TO KNOW: CHRISTINE DE SILVA

PROGRAM MANAGER, NEW ENGLAND



## Your favorite moment in the field last summer:

Last summer we were lucky enough to have a gorgeous, glassy day for shark tagging offshore. We were often surrounded by humpback and minke whales, tuna were breaching around us, a pod of dolphins circled us for a while, and we spotted blue sharks swimming around on the surface. I distinctly remember looking up from satellite tagging the dorsal fin of a large, female porbeagle shark and seeing a humpback whale in the distance. It is not often that you have days that come together like that. It is a day I will not soon forget.

## Your proudest moment from working with Thayer interns:

My favorite moments in the field always happen when I get to see the look on someone's face the first time they see a shark brought alongside the boat. As much as we talk about what to expect before we start fishing, there's always this moment of excitement when we first yell, "shark on!" even if you have tagged hundreds of sharks before. Potentially being a part of someone's first interaction with a shark or their first positive interaction with a shark is always something I cherish.

My proudest moment this past summer was when the interns did the entire workup of a small blue shark on their own. This actually allowed me to get in the water and take photos of them working as a team collecting real data. It was fulfilling to see them assign the tasks between themselves and successfully sample the shark. It's always extremely rewarding to see interns become confident, integral partners in our work.

## Exploring the deep-sea of New England:

Recently, I've focused my marine biology career on the deep-sea: not just species biodiversity and habitats, but the technology and innovation required to explore and document these ecosystems. This summer, our Thayer interns were able to deploy and utilize our custom deep-sea drop-camera rigs off of the coast of Cape Cod, documenting areas that have never been seen before by human eyes. Experiencing this with the interns was really special: bringing technology that's such a big focus in my life into our suite of research tools at BTW, and allowing them to do deep-sea fieldwork that is usually very challenging and often inaccessible in the marine conservation space.





## PROGRAM FOCUS: CARIBBEAN SHARK COALITION

**Founded in 2020, the Caribbean Shark Coalition (CSC) was co-founded by Beneath the Waves and the Dutch Caribbean Nature Alliance (DCNA) in response to international calls for enhanced, collaborative conservation efforts for sharks and rays in the Greater Caribbean region.**

This working group and international think-tank engages scientists, nonprofits, policymakers, and local stakeholders throughout the region to fill critical knowledge gaps around Caribbean populations of threatened species such as sharks and rays, and will also build capacity for collaboration with local managers and governments to inform decision-making and legislation for marine protected areas.

In partnership with the DCNA, the CSC supports 50 members representing over 30 countries throughout the Greater Caribbean region. The coalition has also marched in parallel without the expansion of our own research throughout the northern Caribbean, which is designed to inspire the protection of several hundred thousand square kilometers of ocean over the next several years.

In 2021, we began Phase One of this expansion with a series of new projects in The Turks and Caicos Islands and The Dutch Caribbean. In the Turks and Caicos, we worked alongside the Department of Environment and Coastal Resources and our partners at Big Blue Collective to increase our baseline data on the presence and movements of sharks and rays within the country's Exclusive Economic Zone, adding acoustic telemetry to our suite of research in the region. We liaised directly with local stakeholders, policymakers, and students in the





field, and also provided expert consultation with government officials, as well to the public via local press.

In the Dutch Caribbean, Beneath the Waves joined members of the DCNA, Saba Conservation Foundation, Nature Foundation St. Maarten, and World Wildlife Fund of the Netherlands—on separate expeditions to Sint Maarten and the Saba Bank.

For the first time on the Saba Bank, the expedition team was able to successfully track and



monitor the movements and reproductive status of tiger sharks.

This research resulted in research screens for 56 individual sharks, including 16 tiger sharks with one confirmed early-stage pregnancy,

and the first tagged male in the region. This information is crucial to better protect sharks within the Dutch Caribbean's Yarari Marine Mammal and Shark Sanctuary, and beyond.

Plans for Phase Two of the expansion into Bermuda and The Cayman Islands are underway and set for launch in early 2022, facilitated in 2021 via two large grants from the government of the United Kingdom's Darwin Plus Initiative.











# PERSONNEL SPOTLIGHT

## SAMI KATTAN



### WHERE DOES YOUR PASSION FOR THE OCEAN COME FROM?

My passion for the ocean all started when I underwent my Open Water scuba certification with my brothers. Journeying 60 ft under the ocean's surface truly cemented a bond between us that continues to this day. My older brother Alex and I did the next 2 PADI courses together through college and eventually lead to us living in the tropics for 3 months on the island of Utila, Honduras during our divemaster. Our daily routine became living the island life, scuba diving up to 5 times a day, and hunting for invasive lionfish to enjoy in a tropical ceviche during our sunset hang sessions. During that time I swam with Old Tom, a 45 ft whale shark, that was instantly a life-changing experience. The next day I picked up a GoPro, committed myself to being a voice for the ocean, and the rest is history.

### WHAT DO YOU ENJOY MOST ABOUT YOUR ROLE AS MEDIA DIRECTOR?

What I enjoy most as Media Director is I get to be part of something larger than myself, working with a team that is working towards the conservation of the ocean and planet we love so much. To protect our home to be enjoyed by generations long after we are all gone. Being able to transmit our story to millions of people every year is truly humbling, and I look forward to finding new ways to bring the ocean to everyone's daily lives.

### WHAT WAS YOUR FAVORITE MOMENT WITH BTW IN 2021?

My favorite moment of 2021 was launching our NFT project. The project was such a unique way to reach the public about the importance of sharks and the ocean in an increasingly digital world. Working with our team to develop this alongside a blockchain artist from Romania, Vlad, meant I was on calls at all hours of the day. Working hard for a few weeks lead to our goal, to release the world's first NFT project for ocean conservation. Watching 25% of the project sell out before my eyes in the first 10 minutes while on Instagram live was a moment I will never forget.







# PUBLICATIONS

Creating knowledge is the first step in affecting change. To that end, our team published a record 19 publications—more research in 2021 than in any years previously, with significant contributions from senior researchers. As always, BTW-led studies promote our approach to marine science: impactful stories and diverse and collaborative author lists comprised of scientists, engineers, entrepreneurs,, and even non-scientists.

This year, our published research covered everything from shark movements in The Bahamas to the effects of the COVID-19 lockdown on wildlife. See below for our full outputs.

## THREATENED SPECIES CONSERVATION

- Shipley ON, Lee CS, Fisher NS, Sternlicht JK, Kattan S, Staaterman ER, Hammerschlag N, Gallagher AJ (2021) *Metal concentrations in coastal sharks from The Bahamas with a focus on the Caribbean Reef shark. Scientific Reports* 11:218.
- Bates AE, Primack RB, PAN-Environment Working Group (Gallagher AJ et al.), Duarte CM (2021) *Global COVID-19 lockdown highlights humans as both threats and custodians of the environment. Biological Conservation* 109175
- Shea BD, Gallagher AJ (2021) *Humpback whale instigates object play with a lion's mane jellyfish. Oceans* 2: 386-392.
- Meyer L, Barry C, Araujo G, Barnett A, Brunnschweiler JM, Chin A, Gallagher AJ, Healy T, Kock A, Newsome D, Ponzo A, Huveneers C. (2021) *Redefining provisioning in marine wildlife tourism. Journal of Ecotourism* <https://doi.org/10.1080/14724049.2021.1931253>.
- Moorhead SG, Gallagher AJ, Merly L, Hammerschlag N (2021) *Variation of body condition and plasma energy substrates with life stage, sex, and season in wild sampled nurse sharks *Ginglymostoma cirratum*. Journal of Fish Biology* 98: 680-693.
- Gallagher AJ, Shipley ON, Reese B, Singh V (2021) *Complete mitochondrial genome of the Caribbean reef shark, *Carcharhinus perezi* (Carcharhiniformes: Carcharhinidae). Mitochondrial DNA Part B: Resources*
- Gallagher AJ, Alsudairy NA, Shea BD, Payne NL, Duarte CM (2021) *First application of 360-degree camera technology to marine predator bio-logging. Frontiers in Marine Science* 8:707376.
- Gutowsky LFG, Rider M, Roemer RP, Gallagher AJ, Heithaus MR, Cooke SJ, Hammerschlag N (2021) *Large sharks exhibit varying behavioral responses to major hurricanes. Estuarine, Coastal and Shelf Science* 107373.
- Shipley, O. N., Henkes, G. A., Gelsleichter, J., Morgan, C., Schneider E. V., Talwar, B., Frisk, M. G., (2021). *Shark tooth collagen stable isotopes (<sup>15</sup>N and <sup>13</sup>C) as ecological proxies. Journal of Animal Ecology.* <https://doi.org/10.1111/1365-2656.13518>
- Shipley, O. N., Newton, A. L., Frisk, M. G., Henkes, G. A., LaBelle, J. S., Camhi, M. D., et al. (2021). *Telemetry validated nitrogen stable isotope clocks identify ocean to estuarine habitat shifts in mobile organisms. Methods in Ecology and Evolution*, 12, 897-908.

## MARINE PROTECTED AREAS

- Gallagher AJ, Shipley ON, van Zinnicq Bergmann MPM, Brownscombe J, Dahlgren C, Frisk M, Griffin L, Hammerschlag N, Kattan S, Papastamatiou YP, Shea BD, Kessel S, Duarte C. (2021) *Spatial connectivity and drivers of large shark habitat use within a large marine protected area in the Caribbean. Frontiers in Marine Science* 7:1223.

## DEEP-SEA CONSERVATION BIOLOGY

- Howell KL, Hilário A, Allcock AL, Bailey D, Baker M, Clark MR, Colaço A, Copley J, Cordes E, Danovaro R, Dissanayake A, Escobar E, Esquete P, Gallagher AJ, Gates AR, Gaudron SM, German CR, Gjerde K, Higgs ND, Le Bris N, Levin LA, Manea E, McClain C, Menot L, Mestre NC, Metaxas A, Milligan R, Muthumbi AWN, Narayanaswamy BE, Ramalho SP, Ramirez-Llodra E, Robson L, Rogers AD, Sellanes J, Sigwart J, Sink K, Snelgrove PVR, Stefanoudis PV, Sumida PY, Taylor ML, Thurber AR, Vieira R, Watanabe HK, Woodall LC, Xavier JR (2021) *A decade to study deep-sea life. Nature Ecology & Evolution* 5:265-267

## OCEAN POLICY & GLOBAL CONSERVATION

- Buxton RT, Nyboer EA, Pigeon KE, Raby GD, Rytwinski T, Gallagher AJ, Schuster R, Lin HY, Fahrig L, Bennett JR, Cooke SJ (2021) *Avoiding wasted research resources in conservation science. Conservation Science and Practice* 3: e329.
- Jacoby DM, Fairbairn BS, Frazier BS, Gallagher AJ, Heithaus MR, Cooke SJ, Hammerschlag N (2021) *Social network analysis reveals the subtle impacts of tourist provisioning on the social behaviour of a generalist marine apex predator. Frontiers in Marine Science* doi: 10.3389/fmars.2021.665726
- Gonzalez-Mantilla, Vianna G, Gallagher AJ, P, Gonzalez CL (2021) *Challenges and conservation potential of shark-diving tourism in the Macaronesian archipelagos. Marine Policy* 131:104632.
- Rider MJ, Kirsebom OS, Gallagher AJ, Staaterman E, Ault JS, Sasso CR, Jackson T, Browder JA, Hammerschlag N. (2021) *Space use patterns of sharks in relation to boat activity in an urbanized coastal waterway. Marine Environmental Research.* 172, 105489.
- Queiroz N, Humphries NE, Couto A, Vedor M, da Costa I, Sequeira AM, Gallagher AJ... Sims DW (2021) *Reply to: Shark mortality cannot be assessed by fishery overlap alone. Nature* 595:E8-E16.
- Queiroz N, Humphries NE, Couto A, Vedor M, da Costa I, Sequeira AM, Gallagher AJ... Sims DW (2021) *Reply to: Caution over the use of ecological big data for conservation. Nature* 595:E20-E28.
- Sumaila UR, et al. (2021). *WTO must ban harmful fisheries subsidies. Science*, 374(6567), 544-544.



## PRESS MENTIONS

Our research was covered by dozens of major press outlets in 2021, generating millions of impressions worldwide. Below are a sample of some of the media outlets that covered our work:

 **Discovery**

**Forbes**

**TRAVEL+  
LEISURE**

 **USA TODAY**

 **PBS**

**SCUBA**  
DIVING®

**oceanographic**

**Reader's**  
digest

 **edn**.COM

**eco**  
environment coastal & offshore

EYEWITNESS  
**NEWS**

THE NASSAU  
**Guardian**

TURKS AND CAICOS  
**Weekly News**

**FOUNDATIONS & TRUSTS**

- Roger & Doris Sant
- Wanderlust Fund
- Pacific Treasure Foundation
- King Family Trust
- Sternlicht Family Foundation
- Robert Saad
- Pictet Foundation
- Waitt Foundation
- Mary O'Malley and Lupo Dion Trust
- WCPD Foundation
- De Silva Family Foundation
- The Angel Foundation
- Rockefeller Philanthropy Advisors
- Karo Family Trust
- The Coral Collective

**GRANTS**

- Darwin Initiative
- National Geographic
- Disney Conservation Fund
- Thayer Academy

**CORPORATE SPONSORS**

- Southern Tide
- Grand Isle Resort and Spa
- Cape Clasp
- JDL, Inc
- GoPro
- Lumitec
- Garmin
- Discovery Communications
- Verijet

**KEY INSTITUTIONAL PARTNERS**

- Government of The Bahamas
- Government of the Turks and Caicos Islands
- U.S. Congressional Committee on Science, Space, and Technology
- U.S. Congressional House Ocean Caucus
- The Bahamas Department of Marine Resources
- Deep-Sea Conservation Coalition
- Deep-Ocean Stewardship Initiative

**OPERATIONAL PARTNERS**

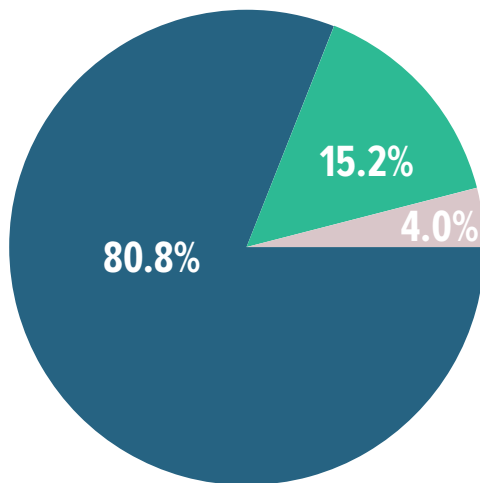
- Paul Hastings, LLC
- Figment Design
- Dutch Caribbean Nature Alliance
- Dive Stuart Coves
- Dive Exuma
- Bimini Scuba Center
- The Oxygen Project
- Big Blue Collective
- Caribbean Shark Coalition

**KEY MEDIA PARTNERS**

- Discovery Channel
- Nomad Creative
- Figment Design
- Comfort Theory
- Diego Camejo Studios

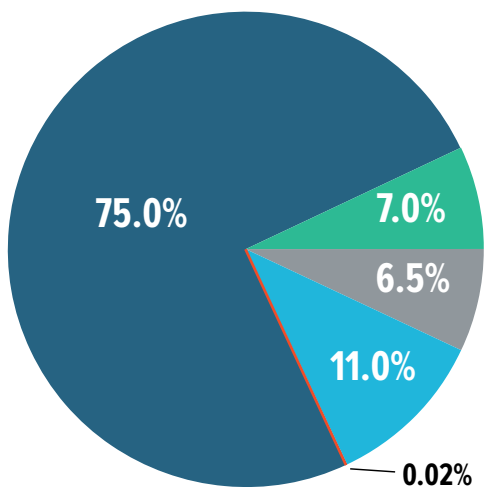


## REVENUE:



DONATIONS & GIFTS	\$1,767,327
SPONSORSHIPS	\$332,000
GRANTS	\$88,000
<b>TOTAL REVENUE</b>	<b>\$2,187,327</b>

## EXPENSES:



PROGRAM SERVICES	\$1,640,495
GENERAL ADMINISTRATION	\$240,606
PROFESSIONAL SERVICES	\$153,113
FUNDRAISING	\$142,176
CHARITABLE CONTRIBUTIONS	\$500
<b>TOTAL EXPENSES</b>	<b>\$2,176,890</b>







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**BENEATH THE WAVES**

Beneath the Waves is dedicated to promoting ocean health and using science and technology to catalyze ocean policy, with a focus on shark conservation and marine protected areas.

[www.beneaththewaves.org](http://www.beneaththewaves.org)



## ENVIRONMENTAL BENEFITS STATEMENT

This annual report is printed on 100% recycled paper - doing so led to the following benefits (over non-recycled paper):

