2022 IMPACT REPORT



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BENEATH THE WAVES

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

MISSION

Beneath The Waves is dedicated to promoting ocean health and using science and technology to catalyze ocean policy, with a focus on threatened species (such as sharks) conservation, marine protected areas, and nature-based solutions to climate change.

APPROACH

Beneath The Waves has focused on three core pillars of research to achieve this mission:

OCEAN GIANTS

Partnering with the largest species to accelerate marine conservation efforts

BLUE CARBON

Mapping links between climate and biodiversity

DEEP-SEA CONSERVATION

Forging new discoveries in the depths of our planet

4 MISSION & APPROACH

LETTER FROM THE CEO

As I reflect on the accomplishments of this past year, I am filled with immense pride and gratitude for the unwavering commitment of our team, partners, and supporters. The year 2022 marked a period of extraordinary growth and success for our organization, as we continued to expand our reach and impact in ocean conservation.

One of the most significant achievements this year has been the acceleration of our newest programs, particularly our Blue Carbon initiative. This program, which focuses on the conservation and restoration of coastal ecosystems like mangroves, seagrasses, and salt marshes, has gained remarkable traction, underscored by our seagrass work in The Bahamas, which received global attention this year. These ecosystems are not only vital for marine biodiversity but also play a critical role in carbon sequestration, making them essential in the fight against climate change.

In addition, our deep-sea program was highly active all year long, supported by two highly prestigious research grants we earned the year prior, both of which are focused on explore the biodiversity of the deep waters of the Caribbean. This year, we launched several expeditions that have uncovered new depth records for several species and revealed first-ever live recordings for several deep-sea shark species. Our work in this area has not only advanced scientific knowledge but also laid the groundwork for more comprehensive conservation strategies at both national and regional levels.

2022 was also a hallmark year for our scientific outputs and our influence on conservation policy. Our research teams published a record number of peer-reviewed papers, which are instrumental in shaping policy discussions and driving meaningful conservation outcomes. Most notably, was the publication of our paper which collaborated with tiger sharks to discover the world's largest seagrass meadow, which went viral online for its global press coverage. We have been at the forefront of advocating for stronger protections of critical habitats, and our efforts have resulted in significant policy advancements and new pieces of legislation, particularly for blue carbon.



None of these achievements would have been possible without the dedication and support of our incredible team, partners, and donors. It is your passion and commitment that fuels our work and enables us to push the boundaries of what is possible in ocean conservation.

Thank you for being a part of this journey with us.

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Austin Gallagher, PhD Founder & CEO

MEET THE TEAM



Austin Gallagher, PhD
CEO

Wells Howe PROGRAM MANAGER

Olivia Dixon RESEARCH COORDINATOR

CORE STAFF

Jamie Fitzgerald MANAGING DIRECTOR

Christine de Silva PROGRAM ASSOCIATE

Shannon Aldridge OPERATIONS COORDINATOR Oliver Shipley, PhD SENIOR RESEARCH SCIENTIST

Sami Kattan DIGITAL MEDIA DIRECTOR

Scotty Gray CAPTAIN

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BY THE NUMBERS

MARINE RESEARCH



18 MAJOR RESEARCH **EXPEDITIONS**





GLOBAL AWARENESS & POLICY



INTERNATIONAL **CONFERENCES ATTENDED**



15 MAJOR PRESS ARTICLES FEATURING OUR WORK



80,000 PEOPLE ENGAGED ON SOCIAL MEDIA PER WEEK



PODCAST LAUNCHED

PROGRAM CAPACITY



DISCOVERY UPDATE: THE LARGEST SEAGRASS MEADOW

Within the past decade, scientists have revealed how effective seagrass and other marine flora can be at sequestering carbon from the atmosphere. As the Earth has continued to warm at an accelerated rate, policy makers and scientists have come together to develop solutions to the issues we are now facing. Beneath The Waves chooses to partner with marine fauna to facilitate discoveries that likely wouldn't be possible without their assistance. On June 30th, 2022, we annouced our discovery of the largest seagrass meadow on Earth.

The team worked on the various aspects of the study from 2016 - 2021, including visually surveying seagrass meadows, sampling sediment cores, remote sensing mapping of seagrass meadows, and placing satellite and camera tags on tiger sharks. All that data compiled and analyzed in collaboration with partners and experts in respective focuses lead to the confirmation that we had discovered potentially one of the most valuable marine ecosystems on planet Earth.



Leading up to the release of this huge piece of science, the Beneath The Waves team engaged with leaders of The Bahamas Government to build capacity for new legislation to allow the Bahamas to benefit form this discovery. Local representatives were delegated to manage a newly-created Blue Carbon Program, while the team continued to work with The Bahamas Government to continue monitoring the seagrass meadows throughout Bahamian waters.

INITIATIVE: BTW STORE

One of the most frequent requests submitted by the **Beneath The Waves** community was branded merchandise. We used sustainable, quality materials, and worked with local artists to carefully craft a line of branded apparel, bags, accessories, and jewelry. Ensuring that the merchandise alligned with the company mission and values, the team proudly launched the BTW Store on April 29th, 2022. The collection allows for our community to support our scientific research and conservation while providing us another platform for exposure.

RENEAT



PROGRAM FOCUS: OCEAN GIANTS

Beneath The Waves continued to work with local governments, other NGOs, and coalitions, to further expand our Ocean Giants program. As one of the leading organizations in this domain (e.g., highly mobile species such as sharks), building capacity within the areas we work was a primary focus for 2022.

Sealers

PROGRAM FOCUS: OCEAN GIANTS (CONT'D)

136 SHARKS WORKED UP

> 50 2 ACOUSTIC SATELLITE TAGS TAGS

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DEPLOYED ON SHARKS

15 NEW ACOUSTIC RECEIVERS DEPLOYED NEW OCEAN GIANTS PROJECT

.2

145 SHALLOW BRUV DEPLOYMENTS

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11 OCEAN GIANTS

PERSONNEL SPOTLIGHT: SHANNON ALDRIDGE, OPERATIONS COORDINATOR

Favorite memory from your first BTW field expedition:

My first field expedition with Beneath The Waves was to Turks and Caicos in December where we continued our Ocean Giants project that was initially established there in 2020. I'd say my favorite memory from that expedition was the team dive that we did. Since it was my first field expedition with the team, they explained that we rarely have the opportunity to dive together and appreciate the incredible ocean that we're working so hard to protect. It was beautiful being able to share that with the team.



Favorite memory from 2022 with BTW:

Honestly, my favorite memory overall is getting offered the position! I specifically remember being at my previous full time job and seeing a response to my follow up e-mail come through; I was nervous to open it but couldn't wait so I stepped away from my desk to go read it. When I read the first line offering me the position I goofily squeaked, did a happy dance, and proceeded to text my partner the amazing news.

What you're looking forward to in 2023:

I'm looking forward to hopefully working with Beneath The Waves in a larger capacity now, and to help the team continue the incredible conservation work being done and bring my skills to the organization.



12 PERSONNEL SPOTLIGHT

INITIATIVE: KIDS DAY CAMP - EXUMA





A critically important aspect of conservation, that is often forgotten with scientific research, is engaging local communities and making science accessible for everyone. More often than not, scientists go to a location, collect and analyze data, then publish their findings, without ever giving the locals access to the information.

With support from Coral Vita Conservancy and Team ECCO, the team hosted over 40 local Bahamian children for a day full of education and fun. The kids learned about their local reef, seagrass, and mangrove ecosystems, as well as sharks and the work that the BTW team has conducted around The Bahamas. At Beneath The Waves, we believe in making science accessible to everyone and in giving back to the local communities where we conduct our research. At the end of July 2022, the team conducted our first Kids Day Camp in Exuma, Bahamas.

PILOT EXPEDITION: MOLA MOLA

The Ocean sunfish, also known as the Mola mola, is one of the most understudied fish on earth, yet they are potentially one of the most significant open ocean species for connecting food webs and cycling DNA. On August 9th, 2022, the Beneath The Waves team boarded M/Y Calliope to launch the first expedition to begin our partnership with Mola mola.

PILOT EXPEDITION: MOLA MOLA (CONT'D)

M/Y CALLIOPE IN KIND DONATION THANKS TO SEAKEEPERS INTERNATIONAL YACHTING SOCIETY

ADDI

During this pilot expedition, the Beneath The Waves team focused on obtaining baseline data on Mola mola: morphometrics, photo IDs, deploying satellite tags, and obtaining tissue and parasite samples. It is hypothesized that these animals are essentially moving reservoirs and are an important source for spreading of genetic diversity. Additionally, because they make significant vertical movements within the water column, there is potential that they could be major contributors to carbon cycling in their respective environment.

> In addition to this initial pilot expedition, two additional day trip expeditions were conducted in 2022 for continued sampling.

MOLA MOLA WORKED UP



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DEPLOYED ON MOLA MOLA

15 PILOT EXPEDITION

PROGRAM FOCUS: BLUE CARBON

While the focus of the Blue Carbon program for 2022 was the announcement and corresponding publication of our discovery of the worlds largest seagrass meadow, the work didn't stop there.

The Beneath The Waves team continued the necessary field work to build capacity for the program. Everything from collecting sediment samples and extruding the cores, to mapping the seagrass meadows with lasers and satellite images. In order to implement a monetary blue carbon credit system, significant baseline science still needed to be performed, which is where our Blue Carbon focused.

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BENEATH THE WAVES



16 BLUE CARBON



BLUEPRINT

Through our research, the team was able to release Blueprint in 2022; a three-phased toolkit designed to discover, value, and protect, blue carbon ecosystems through annual recurring revenue.

HEXAGON PARTNERSHIP

Hexagon is a leading expert in mapping technologies; with their bathymetric LiDAR laser that allows for sub-surface mapping, we're able to map seagrass meadows within 2-5cm accuracy.

PROGRAM FOCUS: BLUE CARBON (CONT'D)



SEAGRASS MEADOWS



65 SEDIMENT CORES TAKEN

TWO NEW SAMPLING LOCATIONS: Aruba & Grand Cayman

17 BLUE CARBON

PERSONNEL SPOTLIGHT: OLIVIA DIXON, RESEARCH COORDINATOR

Favorite memory from your first BTW field expedition: How can I express anything other than sheer excitement about touching and collecting data from one of the most formidable apex predators in the world – sharks! I'll always remember the first time I worked up a young Tiger Shark in The Bahamas. She was a juvenile and hadn't developed her stripes yet, so she had these perfect spots. Feeling her skin, made up of tiny dermal denticles, was smooth one way, but if you brushed against them, they felt like sandpaper, leaving me with what we call 'tiger burn' – it was wild! Sharks are simply amazing.

Proudest moment during a shark work up in 2022:

I think my proudest moment during any shark workup is always ensuring the animal is released safely after we have collected the data we need. But I have to say, working up an 8ft female Tiger Shark in Turks and Caicos was a really cool moment. As a team, we were all working on different things – deploying a satellite tag, inserting an acoustic tag, and I hopped in the water to take her blood to be more time-efficient. It was the perfect example of teamwork, and she swam off beautifully afterward.

<image>

Favorite memory from 2022 with BTW:

The deep-sea Bahamas trip to the Exuma Sound in November was an incredible experience. Witnessing deep-sea Isopods and Gulper Sharks with my own eyes left me completely in awe. I felt unbelievably grateful to have had the opportunity to collect vital data on these cryptic species, which survive in the one of the most extreme environments on Earth and potentially hold answers to help ensure the survival of our own species.

What you're looking forward to in 2023: Continuing to advance our science by executing and leading international field expeditions, as well as conducting my own research on blue carbon ecosystems and shark movement.



INITIATIVE: BENEATH THE WAVES RADIO

At Beneath The Waves, we strive to be innovative in the marine science space. It is not enough to conduct sound scientific research projects if you don't have an audience that is engaged and cares about the results of your efforts. As we continue to expand our research and grow our audience, additional avenues of engagement are essential. In October 2022, the team launched the Beneath The Waves Radio podcast.



PROGRAM FOCUS: DEEP-SEA

Deep-sea programs have recently become a focus within the marine science space for several reasons: it is the most understudied ecosystem on Earth; fisheries are having to shift to the deep-sea as we continue to deplete shallow water fish populations; and most recently, the need to understand how the deep-sea contributes to carbon sequestration.

The team at Beneath The Waves wanted to significantly increase our deep-sea biodiversity surveys throughout 2022. While continuing to use our custom built, non-invasive dBRUVS in new locations, the team also obtained environmental DNA (eDNA) samples with each corresponding deployment, to build a more comprehensive understanding of biodiversity.



PROGRAM FOCUS: DEEP-SEA (CONT'D)

58

DBRUV DEPLOYMENTS While continuing to collect data for established projects, the team was able to expand our deep-sea program to three new locations throughout 2022: Saudi Arabia, Grand Cayman, and Bermuda.

Blurred Lantern Shark (*Etmopterus bigelowi*)

Blotched catshak (Scyliorhinus meadi)

Conger eel spp.

21 DEEP-SEA

SCIENTIFIC PUBLICATIONS

BLUE CARBON ECOSYSTEMS

• Tiger sharks support the characterization of the world's largest seagrass ecosystem. https://doi.org/10.1038/s41467-022-33926-1

OCEAN POLICY & GLOBAL CONSERVATION

- Consequences of "natural" disasters on aquatic life and habitats. https://doi.org/10.1139/er-2022-0050
- Economic impact and conservation potential of shark-diving tourism in the Azores Islands. https://doi.org/10.1016/j.marpol.2021.104869
- Ocean warming alters the distributional range, migratory timing, and spatial protections of an apex predator, the tiger shark. https://doi.org/10.1111/gcb.16045
- Physiological state predicts space use of sharks at a tourism provisioning site. https://doi.org/10.1016/j.anbehav.2022.07.004
- Recreational fishing fight times are not correlated with physiological status of blue sharks (Prionace glauca) in the Northwestern Atlantic. https://doi.org/10.1016/j.fishres.2021.106220
- Redefining provisioning in marine wildlife tourism. https://doi.org/10.1080/14724049.2021.1931253
- Urban sharks: residency patterns of marine top predators in relation to a coastal metropolis. https://doi.org/10.3354/meps14086

OCEAN GIANTS CONSERVATION

- Age-Dependent Dispersal and Relatedness in Tiger Sharks (Galeocerdo cuvier). doi: 10.3389/fmars.2022.900107
- Bulk and amino acid nitrogen isotopes suggest shifting nitrogen balance of pregnant sharks across gestation. https://doi.org/10.1007/s00442-022-05197-6
- Capture heats up sharks, https://doi.org/10.1093/conphys/coac065
- Diving into the vertical dimension of elasmobranch movement ecology. https://doi.org/10.1126/sciadv.abo1754
- Emergent research and priorities for shark and ray conservation. https://doi.org/10.3354/esr01169
- Energetic consequences of resource use diversity in a marine carnivore. https://doi.org/10.1007/s00442-022-05241-5
- Estimated life-history traits and movements of the Caribbean reef shark (Carcharhinus perezi) in The Bahamas based on tag-recapture data. https://doi.org/10.1007/s00227-022-04044-9
- First descriptions of the seasonal habitat use and residency of scalloped hammerhead (Sphyrna lewini) and Galapagos sharks (Carcharhinus galapagensis) at a coastal seamount off Japan. https://doi.org/10.1186/s40317-022-00293-z
- The movement ecology of fishes. https://doi.org/10.1111/jfb.15153

PRESS MENTIONS

In 2022, our research was featured by dozens of major press outlets. An overview of those media outlets can be found below.

Forbes

People



🔅 BahamasLocal



ROADCASTING Orporation F The Bahamas





Earth Touch

Guardian

Newsweek

Smithsonian MAGAZINE

BNN Bloomberg **m** magnetic media

CarbonBrief

23 PRESS MENTIONS

MAJOR SUPPORTERS & PARTNERS

FOUNDATIONS & DONORS

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

GRANTS

- Darwin Initiative
- Disney Conservation Fund
- Thayer Academy

CORPORATE SPONSORS

- Southern Tide
- Grand Isle Resort
- Cape Clasp
- Hillsdale Swimwear
- JDL, Inc
- GoPro
- Lumitec
- Garmin
- Discovery Communications
- Verijet
- ScubaPro

INSTITUTIONAL PARTNERS

- Government of The Bahamas
- Government of the Turks & 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
- Cayman Islands Department of Environment

OPERATIONAL PARTNERS

- Paul Hastings
- Dutch Caribbean Nature Alliance
- Dive Stuart Coves
- Dive Exuma
- Bimini Scuba Center
- Big Blue Collective
- Caribbean Shark Coalition
- Hexagon R-evolution

KEY MEDIA PARTNERS

- Discovery Channel
- Figmnet Design
- Diego Camejo Studios

FINANCIALS

REVENUE:



EXPENSES:



PHOTO CREDIT

AUSTIN GALLAGHER WILSON HAYNES SAMI KATTAN TESSA SKILES DREW MCDOUGALL DIEGO CAMEJO OLIVIA DIXON SHANNON ALDRIDGE

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 highly mobile species conservation and climate-based solutions.

www.beneaththewaves.org

f O D Y

