CCMI

CENTRAL CARIBBEAN MARINE INSTITUTE

2019 ANNUAL REPORT

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CCMI HIGHLIGHTS

100
Visiting scientists

20+
PhD and MSc students

100+
Published scientific papers

1km
Coral grown

1000+
Local scholarships

100,000s
Of supporters from around the world

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PRESIDENT'S MESSAGE

DR CARRIE MANFRINO
PRESIDENT &
SENIOR SCIENTIST

CCMI has reached a pinnacle in our history. We began in 1998 and have grown sustainably and consistently over 20 years. With the help of our stakeholders and supporters, we are realising our vision of being the Caribbean's pre-eminent research institution.

In 2019, we have developed our Vision 2025. It is time to take stock, ensure our goals encapsulate the needs of the organisation, as we continue our journey to protect coral reefs for the future. Everything we do has a purpose, an impact, as to how we can identify resilience within the coral reef ecosystem and ensure these species are protected, understood and given the opportunity to flourish in the future. As a growing organisation, we have our own challenges. We are in a period of extended growth and therefore change, which requires greater governance, structure and oversight. Our Vision 2025 plans incorporate this need for change as we step up to become a more impactful organisation.

In 2019, we continued to strengthen our conservation and education offering, refining our programmes to deliver cutting-edge knowledge from our research.

In 2018, we completed a 20-year survey across the entire Cayman Islands, giving us a snapshot of how reefs are performing over time. The Healthy Reef Report, which summarised the results found from these surveys, was released in 2019 via a calendar of outreach events and stakeholder meetings. We have continued to support early career scientists, growing our scholarships and internship opportunities, including launching our ocean scholar programme and continuing to grow our network of trusted partners. Our restoration programme continues to grow and evolve with the demands of maintaining coral nurseries, responding to disease and changing climate. We know we cannot work in isolation, so we cultivate new and important relationships, such as our collaborations with the Bermuda Institute of Ocean Science (BIOS), Harvard University, Woods Hole Oceanographic Institution (WHOI), University of Florida, the Institute Scientifique in Monaco and the National European Research Council (NERC), so that our work has tangible outcomes that make a difference.

In 2019, we had the pleasure of hosting His Royal Highness the Prince of Wales at the Little Cayman Research Centre. His visit helped highlight the urgent need to protect coral reefs for the future; you can read about the visit in more detail here (page 5).

CCMI benefits from a host of support, from our voluntary board, advisors, volunteers, donors and all the people who give us generous support in kind, sometimes just in the form of advice. All this contributes to our overall success and we would like to thank everyone for continuing to support us.

CHAIRMAN'S MESSAGE

CCMI has been growing for 20 years and we are now a well-recognized research institution, having developed world-leading partnerships and collaborations that are advancing the field of marine science. Our education and outreach also continues to grow, reaching people from all over the globe. By sharing our research results in a useable and meaningful way, we hope to build capacity locally and further afield.

Yet the challenge of protecting coral reefs for the future can seem extremely daunting. Finding the best solutions to managing coral reefs, so they have the chance of a future, can seem overwhelming. Globally, citizens are recognizing the pressure the natural world is under. Locally, there is a strong call for protecting the environment, specifically the marine ecosystem which is so closely aligned to the country's culture. Coral reefs are crucial to the ecological balance that the world is poised upon. We know we are in a race against time and as Chairman of CCMI's board, I want to thank all our supporters and stakeholders for enabling CCMI to keep working, to try and make a difference.

CCMI remains most impactful when we produce research that can shed light on how to protect corals and translate that these results into useful outreach and education materials. Our Vision 2025 plan, which we have developed to provide a strategic pathway for the organisation, builds on these key cornerstone outcomes from CCMI's work. We need to get better and faster at providing evidenced-based solutions to protecting coral reef health.

Thank you to our supporters and stakeholders, who have over the years provided incalculable levels of support.

CHRIS HUMPHRIES
CCMI CHAIRMAN

VISION 2025

KEY STRATEGIC GOALS 2020 - 2025

As CCMI matures, we plan to continue to invest in our future to become a more sustainable institution. In 2019, the organization's executive leaders outlined CCMI's Vision 2025, creating a strategic pathway for the growth. Endorsed by the CCMI Board of Directors, the plan is to improve our capacity and capabilities to deliver our vision, seeking to become the leading marine research institution in the Caribbean.

CCMI believes in vibrant oceans and healthy coral reefs, and that the time to protect coral reefs for the future is now. Our work begins in the Cayman Islands and expands to include multilateral regional and global institutions, to collaboratively provide tangible solutions to the challenges set out by the UN in Sustainable Goal 14.

KEY STRATEGIC GOALS

1. Unlocking the secrets of coral reef resiliency to improve restoration success and prevent the loss of biodiversity.
2. Establishing a world-class research facility that maintains a culture of excellence.
3. Transforming knowledge into action and stewardship in the Cayman Islands and in the Caribbean region.

GOAL 1

UNLOCKING THE SECRETS OF CORAL REEF RESILIENCY TO IMPROVE RESTORATION SUCCESS AND PREVENT THE LOSS OF BIODIVERSITY

- Develop a research strategy focusing on reef resilience and restoration that results in: 10 project publications or presentations per year; quarterly newsletters; an annual report; 3 x webinars; and 10,000+ social media followers.
- Build on the established 20 year coral reef health time series, that records oceanographic and ecosystem changes, enabling us to further understand drivers of resilience and promote solutions to coral reef decline.
- Expand collaborative reef resilience and restoration research networks with the world's leading marine research institutions, in Monaco, Israel, Bermuda, UK, US, UKOTS and Australia.
- Establish a strategic role with multi-national institutions (ICRI, GCRMN, IUCN) and within the Caribbean to advance the region in global discussions on ocean health and to create a share research data bank to improve the protection of biological diversity.

GOAL 2

ESTABLISHING A WORLD-CLASS RESEARCH INSTITUTION THAT MAINTAINS A CULTURE OF EXCELLENCE

- Develop $3.5 million in stable and sustainable multi-year funding streams to support the growth model by 2025.
- Improve the research capacity by engaging early career scientists and by recruiting 4 post-docs and 4 distinguished scientists each year by 2025. Develop the internship programme to host a minimum of 8 interns per annum.
- Advance STEM education in the Cayman Islands by: employing 25+ staff; supporting 12 Caymanian Ocean Science Scholars per annum, training 10 Caymanian Young Environmental Leaders per year; and by investing in 50 scholarships each year for government primary and secondary schools to attend residential courses.
- Improve and expand labs with molecular and genetics equipment (2021), offices and housing (by 2023) and develop region-leading dive/marine research infrastructure (by 2021). Total capital required, $1.5 million.
- Establish an operational model so that research and education can be run simultaneously and compatibly.
- Incorporate best practices in HR, operations, governance, risk management and compliance in 3 jurisdictions (US, UK and Cayman) that transforms the organisation.

GOAL 3

TRANSFORMING KNOWLEDGE INTO ACTION AND STEWARDSHIP IN THE CAYMAN ISLANDS AND IN THE CARIBBEAN REGION

- Conduct science education programmes that can be inclusive of all Cayman Islands primary schools by utilising the Reefs Go Live format, plus a range of interactive resources freely available online, achieving improved ocean literacy and STEM learning. The goal is to reach 10000 children and views each year.
- Continue to develop our outreach capabilities, including 1x exhibit based on the Reefs Go Live concept by 2020.
- Further develop core campaigns, such as Navigators, Reefs Go Live, Healthy Reefs and Women in Ocean Science to bridge the gap between science and society and knowledge and action.

ROYAL EVENT

ROYAL EVENT

CCMI is honoured to be represented by our Royal Patron, His Royal Highness the Earl of Wessex. Usually, we have an annual Royal Patron hosted event either in the UK or in the Cayman Islands, however, in 2019, we were gratefully given permission by Clarence House for His Royal Highness, the Prince of Wales, to visit the Little Cayman Research, as part of his Caribbean Tour.

Our team was delighted to share the research and education work we do, including a coral bleaching demonstration and a special Reefs Go Live broadcast, with opening words by HRH the Prince of Wales, during the visit on the 27th March 2019. The tour lasted several hours and included meeting important members of the local community, meeting school children who were taking a course with CCMI and also taking time to learn more about why CCMI's work is so important for the region.

HRH The Prince of Wales mentioned CCMI in his speech at the end of his visit to the Cayman Islands, saying:

"I was pleased to see some of the excellent work that the Central Caribbean Marine Institute is doing in Little Cayman to help protect the precious coral reefs that surround these islands, as well as those elsewhere in the world. Accelerating, and potentially catastrophic global warming, along with the acidification and pollution of our oceans are nothing short of a planetary crisis that affects us all and, of course, the health of our oceans is absolutely vital for our shared survival."

CCMI is very proud of our extensive connections to the UK, via our Royal Patronage, our UK registered charity standing and our UK Overseas Territory status, and we aim to further develop ties with the UK where possible, in addition to furthering our collaborations in the US and Cayman Islands.

Each year, we host an event for our VIP stakeholders. For information on becoming a Navigator or attending one of CCMI's VIP events, please contact **Kholden@reefresearch.org**

RESEARCH SNAPSHOT

PARTNERS

BERMUDA INSTITUTE OF OCEAN SCIENCES (BIOS)
Gretchen Goodbody-Gringley PhD

CAYMAN ISLANDS DEPARTMENT OF ENVIRONMENT
Tim Austin PhD, John Bothwell, Sophie O'Hehir (MSc)

CENTRAL CONNECTICUT STATE UNIVERSITY
Jerry Jarrett Ph.D, biologist

FLORIDA ATLANTIC UNIVERSITY
Marguerite Koch, Ph.D, Brian LaPointe, Ph.D, Conall McNicholl, Ph.D candidate

HARVARD MEDICAL SCHOOL
Matthew Harris, Ph.D,

KEAN UNIVERSITY
Marilyn White, Ph.D, anthropologist

LOUISIANA STATE UNIVERSITY
Kristine Delong, Ph.D, Gilman Ouellette Jr., Ph.D, Joanna Griffiths Ph.D candidate,

OHIO STATE UNIVERSITY
Susan Jones, Ph.D, entomologist

SMITHSONIAN INSTITUTE
Val Paul, Ph.D, Olivia Rhoades, Ph.D, Bethany Gaffey, Uriah Sun, Courtney Cox, Ph.D, Laetitia Plaisance, Ph.D, and Steven Canty, M.Sc

UNIVERSITY OF FLORIDA
Daniel Veras Mena (masters research), Paul Maneval (masters research), Tom Frazer, Ph.D, Lindsay Spiers, Ph.D candidate, Julie Meyer, Ph.D, Nicole Miller (masters research) and Anya Brown, Ph.D

UNIVERSITY OF IDAHO
Amanda Bentley Brymer, Ph.D, environmental social scientist

PAPERS AND REPORTS

HEALTHY REEF REPORT

Andersson, A.J., Venn, A.A., Pendleton, L., Brathwaite, A., Camp, E., Cooley, S., Gedhill, D., Koch, M., Maliki, S. and Manfrino, C. (2019)
Ecological and socioeconomic strategies to sustain Caribbean coral reefs in a high-CO2 world. *Regional Studies in Marine Science*, p.100677. www.sciencedirect.com/science/article/pii/S2352485518305565

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Molecular characterization of nearshore baitfish populations to improve management in Bermuda. Peer J 7: e7244. https://doi.org/10.7717/peerj.7244.

Goodbody-Gringley, G, Eddy, C, Pitt, J, Chequer, A, Smith, SR (2019)
Ecological drivers of lionfish *(Pterois miles and P. volitans*) densities on mesophotic reefs. *Frontiers in Marine Science* 6: 258. https://doi.org/10.3389/fmars.2019.00258.

Goodbody-Gringley, G, Noyes, T, Smith, SR (2019)
Bermuda. In: Loya, Y, Puglise, K, Bridge, T (Eds.) Mesophotic Coral Ecosystems, Coral Reefs of the World, vol. 12. Springer, Cham. pp 31-45. https://doi.org/10.1007/978-3-319-92735-0_2.

Hearne, E.L., Johnson, R.A., Gulick, A.G., Candelmo, A., Bolten, A.B. and Bjorndal, K.A. (2019)
Effects of green turtle grazing on seagrass and macroalgae diversity vary spatially among seagrass meadows. *Aquatic botany,* 152, pp.10-15.

Molino, C, Angeletti, D, Oldham, V, Goodbody-Gringley, G, Buck, K (2019)
Effect of marine antifouling paint particles waste on survival of natural Bermuda copepod communities. *Marine Pollution Bulletin* 149: 110492.

Silbiger, N, Goodbody-Gringley, G, Putnam, H, Bruno J (2019) Variations in thermal tolerance of *Orbicella franksii* across a latitudinal gradient. *Marine Biology,* 166:126 https://doi.org/10.1007/s00227-019-3573-6.

Tebbett, S.B., Hoey, A.S., Depczynski, M. Wismer, S. Bellwood, D. (2019)
Macroalgae removal on coral reefs: realised ecosystem functions transcend biogeographic locations. *Coral Reefs* (2019) doi:10.1007/s00338-019-01874-w

Turner, JA, Andradi-Brown, DA, Gori, A, Bongaerts, P, Burdett, HL, Ferrier-Pages, C, Voolstra, CR, Bridge, T, Costantini, F, Gress, E, Laverick, J, Loya, Y, Goodbody-Gringley, G, Rossi, S, Taylor, ML, Viladrich, N, Voss, J, Weinstein, DK, Williams, J, Woodall, LC, Eyal, G (2019)
Twenty-Four Key Questions for Mesophotic Ecosystem Research and Conservation. In: Loya, Y, Puglise, K, Bridge, T (Eds.) Mesophotic Coral Ecosystems, Coral Reefs of the World, vol 12. Springer, Cham. https://doi.org/10.1007/978-3-319-92735-0_52.

HEALTHY REEFS

LONG-TERM MONITORING

Field research institutions provide a window into a deeper understanding of trends and changes across multiple spatial and temporal scales of an ecosystem. CCMI's facility has provided a resource for hundreds of visiting scientists and is a location where a long-term record of oceanographic and ecological data is available. Since 1999, CCMI has been conducting annual Atlantic Gulf Rapid Reef Assessment (AGRRA) surveys on Little Cayman making this record one of the longer records of coral reef health for the region. Data gathered through these surveys is essential to understanding changes in local reef ecology, in relation to global and local factors.

In 2018, CCMI concluded reef surveys of 25 reefs across the country: eight reefs on each of the Sister Islands and nine on Grand Cayman. We employed the same AGRRA protocol as was used to survey the reefs in 1999 and re-visited the same sites, so that we could provide an accurate assessment of the change in reef health over the intervening years. We measured and counted fish, algae and corals to species level, as well as recording coral health and mortality. To communicate the status of the Cayman Islands reefs, we adopted the Healthy Reefs Framework *(http://www.healthyreefs.org/cms/report-cards/)* which was developed to provide reports and assess trends across the Meso-American reefs. Statistical analyses were conducted separately for each island and for each fish family. A full Healthy Reef Report was launched in March 2019, supported by a series of outreach events, including community presentations (January 2019), plus inclusion in our reef lecture series (April 2019) and our World Oceans Day celebrations (June 2019). Metrics from the survey indicate stability in reef health, with a rating of Fair+ for the Cayman Islands as a whole. For the Sister Islands, coral cover, coral size, fish density and fish size for the most part indicate no significant changes since 1999. Given the concerns regarding increasing sea temperatures and increasing human pressure, it is a relief to see that reef health has not declined significantly between 1999 and 2018. Similarly, the decline in coral disease, particularly on Grand Cayman, is one very positive result of the surveys; corals appear healthier despite the various disease epidemics that have affected the region recently. In August 2019, the team were back in the water for their annual surveys, the results of which were published in June 2020.

Our Healthy Reefs programme has been made possible by our local sponsors: Foster's, Ogier, Aureum Re, the Cayman Islands Department of Tourism, Dart Cayman Islands and Knighthead.

RESILIENCE

UNLOCKING THE SECRETS OF HERBIVORY

CCMI's current primary resiliency project focuses on understanding the role of herbivorous fish, such as Bermuda chubs, parrotfish, and blue tangs, in maintaining healthy reefs. In 2016, we received a three-year Darwin Plus Initiative grant to determine which herbivorous fish are most essential to the health of our coral reefs. This project was also supplemented by a Paul M. Angell grant to identify whether the stable isotopic signal from coral reef predators can be used to streamline coral reef assessments, using DNA fin clips. We also had support from an anonymous donor, which served as critical matching funds.

The Caribbean in general has a long history of fishing, which has led to regional declines in herbivorous fish populations. Such declines have been highlighted as the potential cause of ecosystems shifts from benthos dominated by scleractinian corals to those dominated by macroalgae. The present role of herbivory in maintaining ecosystem function and reducing algal overgrowth has been a longstanding question in ecology. Moreover, it remains unknown how different herbivorous species may differentially impact these interactions. Can certain species be considered keystones to maintaining coral cover and biodiversity by preferentially grazing fast growing macroalgae? Understanding how different herbivorous species impact reef structure will provide critical information to guide fisheries management.

The main outcome of the project was drafting of the Herbivory Biodiversity Action Plan chapter that was accepted by the Cayman Islands Department of Environment to be incorporated into the overall Coral Reef Biodiversity Action Plan. This will contribute to management strategies and policies related to ecosystem sustainability into the foreseeable future. The project involved the completion of fishing effort surveys and interviews, and this data was incorporated into the fish impact assessment models that directly informed the Herbivory. A spatial map was also generated based on differential levels of herbivory across sites. Diet analysis from 54 specimens occurred in the Fall of 2019 and genetic samples were sent to project partners at the Smithsonian, but the DNA was significantly degraded and we were unable to obtain quality sequence reads. A second set of tissue samples was kept at the field station that we hope to send for sequencing in the near future, however, the complete shutdown of the Cayman Islands as a result of the COVID-19 pandemic has resulted in further delays to this analysis. We are still hopeful that we can get some useful information from these samples in the future to incorporate into the spatial map that will be included in a scientific publication.

Dell, C. L. A., Longo, G. O., Burkepile, D., & Manfrino, C. (2020).
Few Herbivore Species Consume Dominant Macroalgae on a Caribbean Coral Reef. *Frontiers in Marine Science*, 7:676. doi: 10.3389/fmars.2020.00676

RESTORATION

BOOSTING CORALS IN THE WILD

CCMI's restoration project seeks to increase our capacity to improve coral survival in the wild by investing in our ability to identify the next generation of robust and resilient nursery-reared corals. It is urgent that we modify the focus of coral restoration to boost the survival of critically endangered corals restored to the wild. This year presented some highlights (outplanting methodology success) and some project stressors (disease), and the funding from the AALL Trust Foundation, Ernest Kleinwort Charitable Trust, DART Cayman Islands, Stuarts Walker Hersant Humphries, the Disney Conservation Foundation and Consolidated Water, was pivotal in ensuring our research team could respond/ execute the project effectively and successfully.

CCMI's restoration project seeks to establish more resilient nursery-reared corals, increasing the number and diversity of next generation corals that are better able to withstand ecological competition and physical disturbances. Identifying corals that are resistant to warmer ocean temperatures and increasing the survival rate of outplanted corals to 60% is key. The overarching long-term project goal is to improve biological diversity by developing a model for sustaining wild populations of restored corals over the next five years.

In 2019, CCMI researchers expanded a pilot project to assess whether attaching nursery-reared corals to 3D dome structures, that elevate coral outplants above the (wild) reef structure, could improve their survival. We demonstrated dramatically higher survival rates (80%) using the elevated structure (dome) than traditionally outplanted corals (as low as 9%). It is thought that by elevating coral outplants from the substrate we are reducing the impact of competition and predators, creating a more successful outcome for growth and survival. A full expansion and implantation plan is being proposed as the next important step in 2020. A project abstract has been produced, which is being presented at the International Coral Reef Symposium in Bremen (Germany – date now to be determined) Please click here for the ABSTRACT

In the spring of 2019, a disease infected a large population of corals in our nurseries, and in the wild. The unknown disease presents as a white band and kills corals. Our scientists, along with collaborator, Dr. Anya Brown from the University of Florida, were able to map its progression and take hundreds of samples to identify the culprits at the genetic and microbial level. Surprisingly, in August 2019, many diseased corals began to recover and regrow. This provided an unusual opportunity to take samples to determine why certain corals were more resilient than others to the disease. Darwin's 'survival of the fittest' was at play and we were able to identify genotypes which were more resilient (fit) to the disease. An oral presentation will also be made at the International Coral Reef Symposium 2020 (date now to be determined). Please click here for the submitted abstract.

2019 has been an exceptionally warm year and by the end of July 2019, water temperatures in our shallow nursery reached the established bleaching threshold. However, many colonies proved resistant to the bleaching, which gave us a new opportunity to identify heat resistant corals that could be selected for continued fragmentation. Regenerating a population of corals that resistant to temperature stress is core to the restoration project and provides the project basis for 2020.

WOMEN IN OCEAN SCIENCE AWARD (WIOSA)

In 2019, the Brian Melito and Jessica Colker Trust helped CCMI launch WIOSA. This programe has a goal to facilitate the advancement of women in ocean sciences so they become world-leading professionals. By establishing a network and providing mentorship, funding, and field access for a cohort of women in ocean science coming through the ranks to push the frontiers of science, WIOSA seeks to make a difference to women in science with outstanding capabilities. The award will be enacted by granting 1 scholar awards and 2 intern awards per year for 4 years.

The WIOSA will create a network of professionals (men and women) to support a generation of leading women ocean scientists who want to work on topics related to coral reefs and tropical ecosystems. The programme seeks to identify individuals who will raise the profile and improve leadership for women in ocean science. The programme will offer recognition of the WIOSA recipients within the ocean science community; provide funding, facilities and collaboration for their research; support internships for early career scientists; and create a community of WIOSA alumni.

In late 2019, CCMI announced a panel of distinguished scientists to support the awards: Dr Carrie Manfrino (CCMI), Dr Sylvia Earle (Mission Blue), Dr Amy Apprill (Woods Hole Oceanographic Institution), Dr Christine Ferrier-Pages (Centre de Scientifique Monaco), Dr Hollie Putnam (University of Rhode Island) and Dr Gretchen Goodbody-Gringley (CCMI).

The team began recruiting the scholars in January 2020.

EDUCATION & OUTREACH SNAPSHOT

NEXT GENERATION

PRIMARY TO TERTIARY REEF EDUCATION

CCMI continues to work closely with local schools to deliver a range of programmes for students aged 9 to 18 years old. Our Ocean Literary goal is for every child in the Cayman Islands become ocean literate by the age of 12. We want to empower and engage the next generation, so they can become better ocean stewards. Programmes include tropical marine biology, marine ecology and coral reef conservation at one of the world's most beautiful coral reefs. CCMI's aim is to shape students' attitudes and behaviours about the ocean whilst having fun exploring Little Cayman.

MARINE ECOLOGY - COURSES (MEC)

MECs provide a 3-day, 2-night immersive residential course for primary and secondary students. In 2019, CCMI hosted 12 local private groups and also raised funds to support 3 government school groups, 100% free of charge, thanks to generous support from the BODA Charitable Star Trust. Scholarship recipients were selected via an ocean literacy competition, resulting in the 3-day residential course with CCMI. Providing scholarships has been an integral part of the MEC strategy since its inception and remains core to CCMI's education strategy today.

CCMI'S OCEAN SCHOLARS PROGRAMME

Supported by the Edmund F. and Virginia B. Ball Foundation, this programme provides a range of fully funded internships for Caymanian students (3-6 months), as well as scholarships to the Caribbean Marine Ecology Camp (a week-long residential course). The programme has gone from strength to strength and remains pivotal for CCMI, as we can create a ladder of support for students from age 14 onwards. In 2019, ocean science interns included Dimitri Myles, Cassandra MacDowell and Rickeem Lashley, all local students who are on a trajectory to a career in science and who now become part of the CCMI alumni.

YOUNG ENVIRONMENTALIST LEADERSHIP COURSE (YELC)

CCMI's Young Environmentalist Leadership Course (YELC) saw the successful training and mentorship of 10 students in 2019. This year-long course takes students from open water to rescue diver, provides work experience opportunities and introduces the students to the basics of marine ecology and the importance of coral conservation methodology. Thanks to the continued support of Foster's and Cayman National Bank for sponsoring YELC.

REEFS GO LIVE

In its second full year, Reefs Go Live is CCMI's core communications programme for education, and we had a full and exciting season. The Reefs Go Live programme helps CCMI teach directly to students, from ocean to classroom, building on all the residential courses and curriculum learning. 6 livestreamed lessons were delivered in 2019, reaching over 60,000 viewers on YouTube and Facebook. 2019 saw further integration of Reefs Go Live into CCMI's citizen scientist communications repertoire, providing a specific programme to support the visit from His Royal Highness the Prince of Wales in March 2019 and to support World Oceans Day (projected to a live cinema audience in Grand Cayman, live from the ocean). This programme also provides teacher training and a teacher workshop was completed in February 2019. Thanks to the Edmund F. and Virginia B. Ball Foundation, Appleby and the Donaldson Trust for supporting Reefs Go Live.

EMPOWERING COMMUNITIES - CITIZEN SCIENCE

Citizen scientists, including those organised by Earthwatch and Diving with Heroes (a group of military veteran scuba divers), assist in research projects through CCMI. These recreational divers and snorkelers learn research methods and participate in data collection and analysis as part of ongoing research projects. Their enthusiasm and skills allow their time in-water to contribute to a greater purpose and the CCMI team always enjoy hosting these groups.

GLOBAL REACH

VISITING COLLEGE PROGRAMMES

CCMI hosts university groups at the Little Cayman Research Centre throughout the year, helping to bridge the gap between research and education (in-situ). Wellesley College, Dartmouth University, Cedar Crest, UNC Greensborough, and the University of Wisconsin Lacrosse joined the team in Little Cayman, for an immersive research experience in 2019. We also had a busy Coral Reef Internship, as part of Rutgers Study Abroad programme in June 2019 and we had a first visit from the UK's Malvern College in August 2019.

CCMI IN THE COMMUNITY

Each year, CCMI sets a campaign theme, linked to the current research programme, to amplify results and engage local stakeholders. The Healthy Reefs Programme (x) was supported by the outreach campaign "We Love Healthy Reefs" and the Reefs Go Live broadcast content also looped into this theme (10), providing the main vehicles for CCMI's community outreach. This year, the World Oceans Day activity (19) and the Royal Visit (5) created additional opportunity for CCMI to further develop our global communications as our local activity could also be share digitally, as we focus on extending our reach beyond the Cayman Islands.

In 2019, CCMI also has also developed a more strategic approach to outreach via professional bodies such as the IUCN, ICRI and stakeholder groups such as the Friends of Cayman and the UK Overseas Territories Working Group. Better PR connections have also been established via the Cayman Islands Department of Environment, plus coverage in Forbes Magazine and National Geographic have also helped us get the word out that we can save coral reefs!

FUNDRAISING

OVERVIEW

CCMI raises funds through 3 core revenue-generating activities:

EARNED REVENUE – fees from education courses and visiting scientists at the Little Cayman Research Centre.

UNRESTRICTED FUNDRAISING EVENTS – this includes the annual Festival of Seas Gala, the Navigator's Council and private donations from trusts, companies and individuals.

RESTRICTED FUNDING – project specific revenue raised via donations and grants.

The combination of all three revenue streams ensures CCMI has a sustainable income and to date, this model is effective in raising the funds we need to operate and develop the projects. The challenge for CCMI, and any non-profit, is staying far enough ahead of the grant and foundation giving cycles to offset the end of grants or change in granting criteria. CCMI celebrated our 20th Anniversary in 2018 and many of our supporters have been with us for many years - donor fatigue is a very real prospect and the team work hard to evolve and diversity the fundraising strategy to ensure we can accommodate changes in funding.

Sponsored education courses and grant-based research activity at the Little Cayman Research Station continually drives restricted revenue and 2019 saw a solid fundraising performance in these areas. Yet CCMI's new funding revenue came from private donors and trusts in 2019. Trusts remain a growing area of support for CCMI and in 2019 we received new support from the AALL Foundation Trust, in addition to the BODA Charitable Star Trust and an anonymous family trust. Feedback from our donors suggests that CCMI offers a personable and responsive relationship, which particularly suits trusts and foundations, for engaged supporters of coral reefs.

CCMI's unrestricted fundraising revenue continues to be a cornerstone, increasing to 29% of revenue in 2019, in comparison to 16% in 2017 and 27% in 2018. The community in Grand Cayman provide essential support and donations to our main events, such as the Festival of Seas.

THE FESTIVAL OF SEAS

The 2019 Festival of Seas Annual Gala (FOS) took place at Grand Old House with a Coral Carnival theme. The evening was supported by local carnival company 'Swanky', giving a colourful and energetic feel to the evening. This beautiful event was set in a stunning location, pertinent to CCMI's cause and 265 attendees raised circa US$168,000 on the evening. The Festival was hosted by Chris Duggan and was opened by Frans Manderson on behalf of the Governor of the Cayman Islands' office. The evening also included a keynote speech by Dr. Gretchen Goodbody-Gringley, who CCMI announced as their new Director of Research, taking office in January 2020. We would like to thank our FOS sponsors, attendees and auction item donors. The event also included a People's Choice Healthy Reef Award, celebrating local stakeholders who go to great efforts to protect the local environment.

Proceeds from the evening go directly to our projects often supporting seed money or key operational investment. Funds from this event helped support Dr Goodbody-Gringley's new Reef Ecology and Evolution Lab (REEL).

HEALTHY REEFS AND WORLD OCEANS DAY

Each year, CCMI conducts an outreach campaign succinctly communicate our research findings and conservation efforts. This year, the "We Love Healthy Reefs" Campaign included quarterly outreach events including lectures and local talks. The pinnacle outreach event for the year however was the Reefs Go Live event, held on World Oceans Day at the Camana Bay Cinema. Thanks to Dart Cayman Islands and our Healthy Reef Sponsors, we held a free of charge live streaming event from the depths of the ocean in Little Cayman, to the audience in Grand Cayman. "We can save healthy reefs" was a huge success, as the CCMI research team took the audience on a unique journey, allowing them to ask questions and interact with our scuba team as they showcased the healthy reef system in Little Cayman, to great effect. We would also like to thank Bank of Butterfield for their support for World Oceans Day and the Healthy Reef sponsors, highlighted on page 10.

FINANCIAL SUMMARY

2019 ANNUAL FINANCIAL REPORT

2019 saw another strong financial performance with the following elements contributing to a positive outlook:

- Unrestricted funds were increased to circa 51% (earned revenue + unrestricted fundraising) of the total revenue, giving the organisation more financial leverage to initiate new projects.
- Key grants that came to a natural end were renewed or replaced, mitigating risk and ensuring the relationship/donor pool is increasing for long-term sustainability.
- Strong operational expense controls due to increased protocol implementation and tighter financial management have been achieved.

2019 FINANCIAL SUMMARY

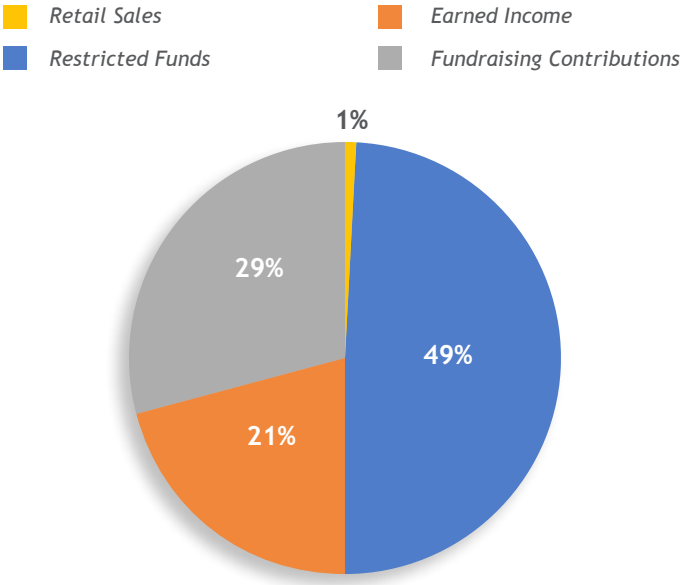
CCMI made a net profit of $41K in 2019 (2018: 232K). The decrease on year-on-year net profit was due to a $114K decrease in revenue compared to 2018 (2019: $1.673m 2018: $1.787m) and a $75K (4%) increase in expenses during the same period (2019: $1.630m; 2018: $1.555m). The shift in both expenses and revenue was expected due to changes in grant cycles (revenue) and commitment to multi-year funded project costs (expenses). In 2019, 11.1% of total costs were for support services (2018: 9.5%), and the remaining 88.9% spent on the delivery of programs (2018: 90.5%).

Consistent with prior years the earned income of CCMI is largely from university bookings, courses, visiting scientists, retails sales and interest income. Earned revenue continues to play an important role for CCMI, ensuring a stable income, which results in unrestricted funds that can support operational overhead and management of the asset.

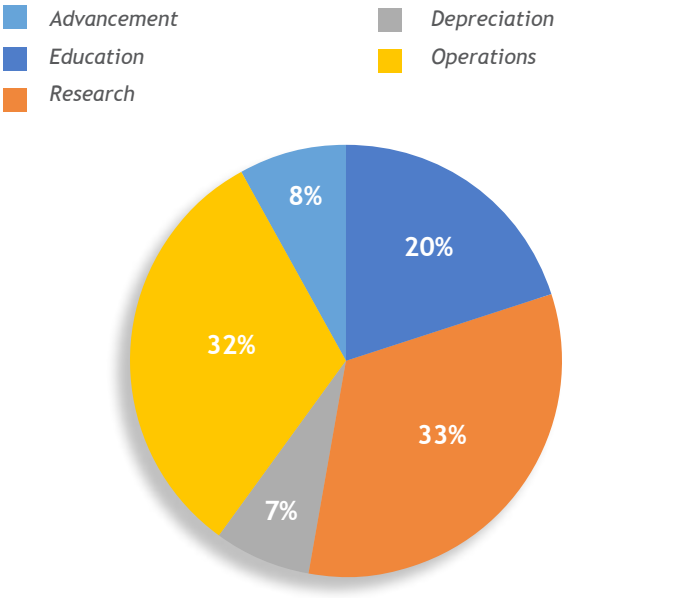
A decrease in Temporarily Restricted donations by $147k and a net profit of $41K resulted in a decrease in equity for the 2019 year of $106K (2019: $2.686m; 2018:$2.792m).

Contributions receivable as at 31 December 2019 decreased by 17% compared to 31 December 2018, mainly due to the 2019 installment being paid of a $300K receivable from one research grant due over 2019 to 2021.

2019 CCMI REVENUE SOURCES



2019 CCMI EXPENSES



Please note all 2019 figures in this report are unaudited.

2019 IN KIND SUPPORT

In kind support remains a bedrock of CCMI's operation. We would like to thank the many professional firms who have supported us in 2019, including: KPMG for the annual audit, Stuarts Walkers Hersant Humphries for legal services, Broadhurst LLC for legal services, Berman Fisher for accounting support services, Copper Blue Communications Ltd for PR, Communications and Brand Development support, Douglas Ziegler LLC for US accounting support, SALT Technology Group for IT support and Frans de Backer for videography support, as well as the Board of Directors and Officers who give their personal time in support of CCMI's mission. CCMI would also like to thank the project technical advisors who donated many in-kind hours in expertise, specifically Pauline Simpson, Susan Guilmette, David Guilmette and Greg Locher.

2019 OPERATIONAL RESERVES

CCMI aims to maintain an operational reserve to meet basic operational costs (salary, insurance, mortgage, etc) for a period of six months.

Restricted Contractual Reserves for program delivery following year	**$219,897.80**
Operational reserve	**$189,074.86**
Unrestricted free cash	**$54,988.34**
Total End of Year cash on hand	**$463,961.00**

GOVERNANCE

HOW WE ARE GOVERNED

CCMI leadership has a strong, demonstrable track record in research and conservation, led by Dr. Carrie Manfrino, President and Chris Humphries, Board Chairman. The organisation is governed by a Board of Trustees in the Cayman Islands and USA and by the Trustees of the UK Charity (outlined below).

The Board of Trustees is supported by a Research Council to steer research strategic development and core themes. The council also provide support to project development if required.

The Board of Trustees is also supported by a group of special advisors, who specialise in areas of need, such as human resources (HR), technological development (specifically education related) and company governance.

STATUS

The Central Caribbean Marine Institute has charity status in the Cayman Islands (CCMI Cayman – NP#3), is a UK registered charitable organisation (#1104009) and a US 501 (C)3 non-profit (#22-3609293).

GOVERNANCE CODE

As a company operating within multi-jurisdictions, CCMI has a strict code of governance that complies with the UK, US and Cayman Islands requirements. CCMI has an engaged board of trustees and management team all aligned and engaged with the company's very clear mandate, to protect coral reefs for the future. The shared mission and culture within CCMI therefore aligns with the Charity Commission's Governance Code (2017), the 501 (C) 3 governance checks (IRS) and the Cayman Islands non-Profit Organisations Law 2016.

REGISTRATION DETAILS

Mailing Address in the United States
CCMI, PO Box 1461, Princeton, NJ 08542

Mailing Address in the Cayman Islands
CCMI, Box 37, Little Cayman, Cayman Islands KY3-2501

Mailing Address in the United Kingdom
40 Bank Street, Canary Wharf, C/O Dominic McChill, London E145DS

BOARD

2019 US and Cayman Islands Board
Dr Carrie Manfrino - President
Chris Humphries - Chairman
J.S de Jager - Treasurer
Dr Tom Frazer (resigned March 2019)
Dr Martina Koniger
Tim Kary
Secretary - Pauline Simpson

2019 UK Board
Tim Ecott
Andrew Hersant
Kate Holden
Dominic McCahill
Dr Carrie Manfrino
Chris Humphries

Principal Professional Advisors
Accounting - Berman Fisher
Audit - BDO (2019 audit) KPMG (2018 audit)
Solicitors - Stuarts Walker Hersant Humphries, Broadhurst LLC
Bankers - Bank of America, Fidelity, UBS, Cayman National Bank, Bank of Butterfield, HSBC UK.

POLICIES

PUBLIC BENEFIT

CCMI was established in 1998 to protect the future of coral reefs through research, conservation, and education. We opened the Little Cayman Research Centre in 2005 and the facility has become a preeminent Caribbean marine institution, working on one of the most pressing issues facing the region: the protection and conservation of coral reef biodiversity. Our work benefits the scientific community regionally and around the globe, as well as children who we engage in ocean literacy programmes and international students who we empower to reduce their impact on and improve the vitality of our oceans. We have a research agenda that includes actionable projects that are essential to advance the science and deliver solutions needed to inform coral restoration efforts around the globe. What makes CCMI different, however, is our commitment to transforming knowledge into impactful educational outreach.

RESERVES POLICY

CCMI's reserves policy outlines three areas of reserve:

- Contractual reserves – where CCMI has a contract that specifies how funds must be utilised (a grant, for example). These funds are treated as restricted funding and reported on accordingly.

- Board and Management Initiatives – in accordance with the goals and objectives of the organisation, the board and management periodically set up reserves (restricted funds) for particular initiatives that they feel are key to the organisation

- Operational reserves – the organisation aims to maintain an operational reserve to meet basic operational costs (mortgage, salary, insurance, utilities etc) for a period of six months.

RISK MANAGEMENT

In 2019, CCMI identified areas that require further development in the areas of HR, financial management and IT infrastructure. As part of the Vision 2025 process, the executive team further developed the company sustainability protocols, looking at needs for the future to support CCMI's expansion and longevity. A third party review of our systems has begun and the organisational structure is also being developed to accommodate required strategic changes. In 2019, CCMI hired a new business manager, who works closely with the president and our external accounts firms, to better manage CCMI's financial policies and responsibilities to our US 990, company audits and fiscal management required to manage restricted grants.

CCMI has grown consistently since 2010. The company structure and governance requirements are also therefore evolving.

CORPORATE SPONSORS


AGGRESSOR
ADVENTURES


ALEXANDRIA


APPLEBY


Aureum Re


BDO
CAYMAN
ISLANDS


BALBOA
MANAGEMENT LTD


HLB
BERMAN FISHER


BROADHURST
ATTORNEYS-AT-LAW


Butterfield


CDG
cayman distributors group


Cath Church


CAYMAN
ISLANDS
Grand Cayman • Cayman Brac • Little Cayman


CAYMAN
NATIONAL


CONSOLIDATED
WATER


CopperBlue


DART


Dart
Foundation


DARWIN
INITIATIVE


Disney
CONSERVATION
FUND


EY
Building a better
working world


Ernest Kleinwort
Charitable Trust

ALL TRUST FOUNDATION | BODA CHARITABLE STAR TRUST | BRIAN MELITO AND JESSICA COLKER TRUST
EDMUND F. AND VIRGINIA B. BALL FOUNDATION | THE ART AND PHYLLIS GRINDLE FOUNDATION | THE HARTFORD FAMILY
THE HUMPHRIES FAMILY | SUSAN OLDE OBE | OLIVER S. AND JENNIE R. DONALDSON TRUST | SUREFINE FUND LTD.

VOLUNTEERS & SUPPORTERS

ABBY GUILMETTE
AGGRESSOR
AIDA VAN WEES
AMANDA GOODWIN
ANDREA & STEVE HUGHES
ASH MCKNIGHT
BRIGITA NEMET
BRIAN MELITO AND THE JESSICA COLKER TRUST
CATHERINE CHILDS
CATHY CHURCH
CHRIS & JOANNA HUMPHRIES
DEBBI TRUCHAN
DENA KEMP
DIANA SCHMITT
DOMINIC MCCAHILL
ELLEN CUYLAERTS & MICHAEL MAES
ERIN QUIGLEY
FIONA, BOB AND JEN MOSELEY
FRANS DE BACKER
GRAND OLD HOUSE
GREG LOCHER
DR JACK GELFAND
JEFF JAKUBIAK
JOE & SUSAN PLOPLYS
JS DE JAGER
KATIE ALPERS
LAUREN CHRISTIE
MARY JONES
MAGGIE JACKSON
MELISSA WOLFE
MIKE & MEREDITH GUDERIAN
MIKE & WENDY MANNISTO
MYRA & JAMES COWAN
NADIA HARDIE
NATALIE URQUHART
NICOELA MCCOY
PAULINE SIMPSON
PETER HILLENBRAND
SIMON & CANDY WHICKER
SUE AND DAVE GUILMETTE
SUZY SOTO
WILLIAM WAGGOTT

HOW CAN YOU HELP CORAL REEFS?

Become a *sponsor* or project *donor*

Volunteer skills

Share our work

Become a CCMI *Navigator*

Get involved with Reefs Go Live

Become a *member*

Want to get involved?

See our website for news and events

www.reefresearch.org