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HEALTHY REEFS 2019

*We can save coral  
reefs, if we act now*



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# Can We Save Coral Reefs?

The United Nations (UN) reports that 70% of the earth's coral reefs are threatened. Time is not on our side, but the UN's 2030 Agenda for Sustainable Development outlines a plan for the future protection of the ocean, including Sustainable Development Goal (SDG) 14 which identifies a clear and measurable strategy for conserving the oceans. This global, time-sensitive approach is at the heart of CCMI's strategy. CCMI's work therefore speaks to how we can save coral reefs, but we must act now.

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*With thanks*



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The background of the slide is a vibrant underwater scene featuring various types of coral reefs. In the upper portion, there are tall, branching white corals against a deep blue background. Below this, a large, textured yellowish-orange coral structure is prominent. The bottom of the image shows more diverse coral life, including smaller, colorful species.

## *Message from* CCMI's President

A circular inset portrait of Dr. Carrie Manfrino, the President and Founder of CCMI. She is a woman with dark, curly hair, wearing a pearl headband and a dark top. She is looking slightly to her right with a thoughtful expression, her hand resting near her chin.

Confronting declines in the ocean's biodiversity requires transformative approaches and significant scientific and socioeconomic solutions.

CCMI's marine research station, extensive facilities and resources on Little Cayman offers the greatest opportunities to drive these solutions. For coral reefs, these solutions are more urgent than ever. CCMI is dedicated to delivering scientific discoveries to improve our understanding of how key species can thrive in the current climate. We recognise that not all species will survive, but we believe there is hope. We must identify species that are underpinning resilience to change and advocate for their protection.

We make our vision a reality by undertaking cutting edge, impactful research and transforming this research into conservation and education initiatives which will serve to bridge the gap between knowledge and action. We are looking to unravel the secrets to building resilient and resistant reefs that will boost the potential of many coral species to survive in this precious ecosystem. We are yet to discover the full adaptive potential of marine species to climate stress...BUT we are excited to report that we have discovered that some individuals within a group of species are capable of rapid adaptation. We have exposed this group to climate stress and can see that they are more capable of survival than those not exposed. In the meantime, it is clear that societal level changes will be required to reduce human impacts on the entire ocean ecosystem. CCMI serves to be the protector and voice for coral reefs, seeking a future with vibrant oceans and healthy coral reefs.



**Dr Carrie Manfrino**  
President and Founder





## CCMI's Focus

As a Caribbean-based marine research institution, CCMI identifies the following responsibilities that we believe are crucial in building a sustainable future:

Firstly, we support innovative researchers, especially early career scientists who are seeking solutions to the decline in coral reefs. Through science-based approaches, we must offer solutions to building ecological (and thus human) resilience to climate change.

Secondly, recognizing that human impacts are the underlying cause for the loss of 60-80% of coral reefs globally, we must utilize the world stage and the unlimited potential of global communications. CCMI's underwater livestreaming telepresence programme, Reefs Go Live, is a unique and innovative opportunity where scientists can engage and connect with students of all ages directly from the ocean. Improving humanity's understanding of our interconnectivity with the ocean, especially for young impressionable minds, will be key to transforming behaviours that result in the destruction and exploitation of precious ocean resources.







## *Research &* Conservation



CCMI's work seeks to conserve coral reefs, focusing on the restoration of key functional groups that are responsible for maintaining the balance.

We are looking to unravel the secrets to building resilience and resistance so we can rehabilitate these precious ecosystems. Our work will focus on understanding the full adaptive potential of marine species to climate stress. Reducing human impacts on the entire ocean ecosystem is a matter of urgency. This includes addressing those practices that are de-habilitating the ocean's natural responses to stress, such as overfishing, destructive fishing and polluting the ocean.

In 2012, CCMI established our coral restoration project where we currently manage and maintain the region's largest coral nursery(s). This project explores the potential to grow and restore threatened coral species; it has been successful but requires enormous human and financial resources to accelerate the positive impacts. By teaming up with scientists from major institutions, we plan to more aggressively scale up our restoration work, cautioning that the enormity of the problem has to be addressed from a collaborative scientific-basis.

CCMI's Healthy Reef Report, which resulted from a three island wide survey in 2018, is a continuation of our long-term monitoring, a programme that began 20 years ago. We have tracked the changes over time, and more importantly, we can identify long-term indicators of declining or improving reef health. This activity gives us an important snapshot as to how local reefs are performing in the Cayman Islands, providing a benchmark for reef health that is critical to the future planning and protection of the coral reef ecosystem.







## *Establishing a* Centre of Excellence

Our aim at CCMI is to create a world-renowned Centre of Scientific Excellence for Coral Restoration, where focus is placed squarely and appropriately on solution-oriented research. Innovation and application will become a hallmark of the Centre.

Access to modern laboratory facilities and an unspoiled coral reef ecosystem provide a unique opportunity for scientists at CCMI and its partner institutions to advance our understanding of global environmental change and its effects on coral reefs and island economies. Our urgent work will be designed to create, implement and evaluate strategies to ensure the survival and long-term persistence of coral reefs. Toward that end, we've embarked on a deliberate research agenda that includes a series of actionable projects that are essential to advance the science and deliver solutions needed to inform coral restoration efforts around the globe.

Recent scientific discoveries by our scientists and innovations in nursery technologies by our scientific support staff have already allowed us to identify and culture corals that will be more resistant to future changes in climate, including increases in ocean temperatures. Despite enormous success growing, diversifying and building resilient populations of at several nursery sites, coral mortality is high (up to 80%) when re-planted to wild reef substrates. This mortality rate in outplanted coral is being seen widely across restoration activity.

Therefore, it is urgent that we modify the focus of coral restoration to boost the survival of critically endangered corals restored to the wild. CCMI's strategy over the next five years is to:

- 1 Increase the number and diversity of corals within the nursery that are resistant to warmer ocean temperatures;
- 2 Determine how to grow corals that are better able to withstand physical disturbances that will result from an increase in the frequency of tropical storms and hurricanes; and
- 3 Through rigorously designed field experiments, optimize outplanting strategies that lead to enhanced coral survivorship in the wild.



CCMI has been and will continue to be a pioneer in the coral reef restoration arena. The future of coral efforts is dependent on our success, as ours is one of the few restoration projects that includes research-integrated solutions to better understand how restoration can contribute to the wild coral population of the future. What is significant is that we find a solution that can be scaled up so that reefs globally can survive.





## Education & Outreach



One of CCMI's core goals is to transform our scientific discoveries into action and education. In 2018 alone, our International Year of the Reef lecture series and 'Reefs Go Live' broadcasts reached more than 60,000 people all over the world.

As we take our results and make them available as online resources for teachers, students and citizen scientists, we want to be sure we give hope and resolve for all of us to lead the societal level changes required for saving coral reefs. We believe each individual can make a concerted effort to change specific activities that reduce their impact to the ocean. CCMI believes that communicating "how to establish healthy reefs" is key to coral reef conservation efforts and ocean stewardship around the globe.

CCMI works closely with local and international schools to deliver a range of programmes for students from primary to tertiary level. By imparting to these students a passion for the ocean and an understanding of its importance to our lives and culture, we empower the next generation of environmentalists. Programmes offered by CCMI 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 via residential and virtual experiences. CCMI also hosts varied and robust outreach programmes, including reef lectures, webinars, tours and live broadcasts. We believe that everyone can play a role in ensuring healthy reefs and vibrant oceans for the future.







*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](http://www.reefresearch.org)





## 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

## CONTACT

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CCMI is registered in the U.S. as a 501(c)(3) nonprofit organization (ID# 22-3609293); in the UK (#1104009) and in the Cayman Islands. U.S. donations are fully tax-deductible as allowed by law.