

CHARM[®]

the coral farming robot

Research shows it takes 4,000 hours to clean and maintain 10,000 coral fragments—equal to 3 people working full-time for 1 year.

To save our reefs, we estimate that 100,000 corals will need to be planted everyday. That is a lot of labor!

Currently, staff labor accounts for about 50% of annualized costs at coral nurseries.

To minimize nursery expenses and maximize coral health, CHARM aims to automate repetitive tasks in coral farming.

CORAL HUSBANDRY AUTOMATED RACEWAY MACHINE

TOOLS

CORAL
FRAGMENTS
& LARVAE

RACEWAY

CHARM combines coral farming with computer automation to reduce costs and save time.

A user selects a program sequence from the online portal to clean baby corals. When prompted, the machine carriage switches to the corresponding tool—in this case, a soft bristle brush—and begins to clean away algae automatically until completion. The software and onboard camera can detect corals and clean them safely.

To serve its principal objective, CHARM is designed to help restore coral reefs around the world. The design uses commercially available parts to integrate into existing industry methods. This innovation is affordable and accessible for global communities who are interested in coral farming.

WHY CHARM?

Aquaculture for coral offers considerable promise for restoring reefs and preserving biodiversity.

Asexual reproduction accelerates coral growth up to 50 times its natural state. Corals can hybridize, which also increases natural genetic resilience.

CHARM is intended to yield healthier and higher volumes of coral, reduce handling stress to coral, minimize exposure to pathogenic factors, increase growth rates, and improve cataloging techniques.

CHARM WILL:

- Clean coral with a rotary agitator
- Cultivate coral with a nozzle
- Catalog coral with an inspection instrument
- Utilize interchangeable tool tips



IMPACT

- Designed for scalability
- Composed of commercially available parts



VALUE PROPOSITION

- Saves time, reduces cost, and increases coral
- Relieves coral farmers and scientists by automating labor



EASY TO LEARN

- Online application available
- User interface with simple drag-and-drop platform



INTELLECTUAL MERIT

- Environmental technology meets robotic coral farming
- Patent-pending, invented by engineer trained by NASA & MIT



CORAL: OUR OASIS

Coral reefs occupy less than 1% of the ocean floor but support more than 25% of marine life ... by 2050, up to 90% of reefs could be gone. —WWF 2019 report

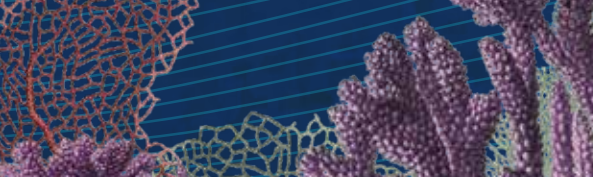
Coral reef plants and animals are important sources of new medicines being developed to treat cancer, arthritis, human bacterial infections, Alzheimer's disease, heart disease, viruses, and other diseases. —NOAA

When reefs are damaged or destroyed, the absence of this natural barrier can increase the damage to coastal communities from normal wave action and violent storms. —National Ocean Service America

Beyond Coral Foundation's ultimate goal is the protection, conservation, and restoration of reef systems. Our strategy uses technology, art, dissemination of science, and cultural integration.

BEYOND CORAL FOUNDATION

is proud to launch CHARM



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