The Coral Farm

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Introduction

The Stockton Aquarium and Aquaculture Club (SAAC) has utilized coral husbandry and cultivation methods to build a coral aquaculture system that is designed to house a number of coral specimens.

The purpose of this project is to provide students with hands-on experience in coral propagation practices. Students are able to work with equipment and supplies that are widely used in this hobby and industry. Having these skills also allows for further research in coral restoration and their overall biology.

The corals grown in this farm will be sold at aquarium trade shows, frag swaps, and at SAAC meetings. All proceeds will go towards keeping this farm running.

Lighting

A combination of AI Hydra LED and T5 lights are used. They can be monitored and controlled through the 'myAI' smart app with the ability to change intensity and add spectrums based on the needs of the coral.

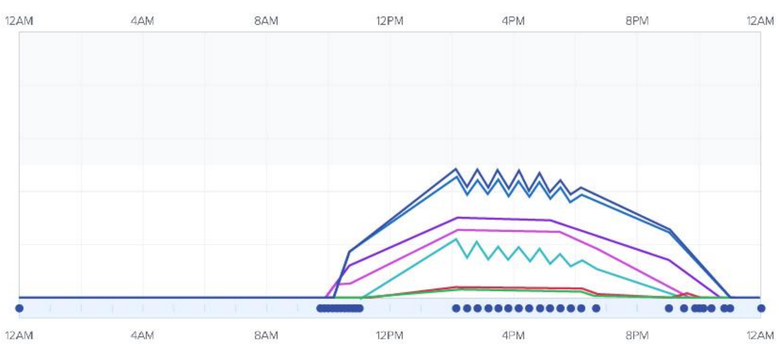

Figure 1 Lighting is set on a diurnal cycle to mimic the natural environment.

Acknowledgments

Equipment and supplies were generously donated by CerMedia, Pro-Clear Aquatics, AquaticLife, Shore Aquarium Services, Segrest Farms and Atlantic Aquariums. A huge thank you to Damon and Alex from Shore Aquarium Services and the Marine Field Station staff for their expert help in getting this project up and running.

Filtration

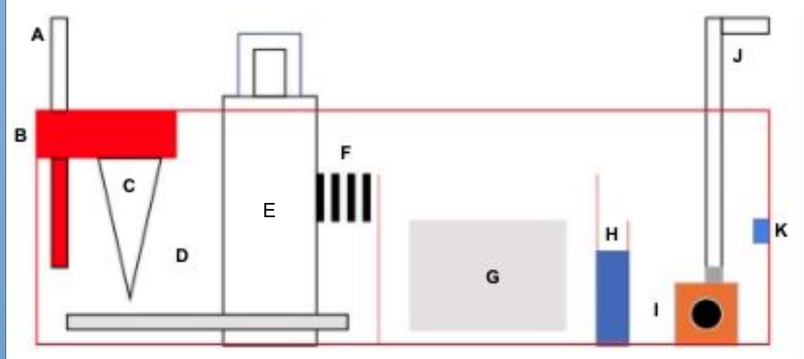

Figure 2 Sump filtration of main frag tank: (A) Drain, (B) Bubble diffuser, (C) Filter socks, (D) Heater, (E) Protein skimmer, (F) Probes, (G) Bio media, (H) Baffle with sponge, (I) Return pump, (J) Return, and (K) Auto top-off.

Figure 3 The Apex Neptune System controls all equipment from figure 2 and monitors salinity, pH, temperature, and oxidation reduction potential (ORP). It can be monitored and controlled from anywhere through the 'Apex Fusion' app.

Water Chemistry

Observing and maintaining water chemistry is vital for keeping corals healthy. Levels that are checked routinely include pH, nitrate, nitrite, ammonia, calcium, phosphates, magnesium, and alkalinity. HANNA checkers are used to measure calcium, phosphates, and alkalinity. An API saltwater testing kit is used to test the remaining chemicals. If any chemical levels are off, water is treated accordingly to ensure proper and safe conditions.

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Coral Fragging

Corals are grouped together depending on their hard or soft body form. The hard corals have a skeletal structure and consists of two groups: large polyp stony (LPS) and small polyp stony (SPS).

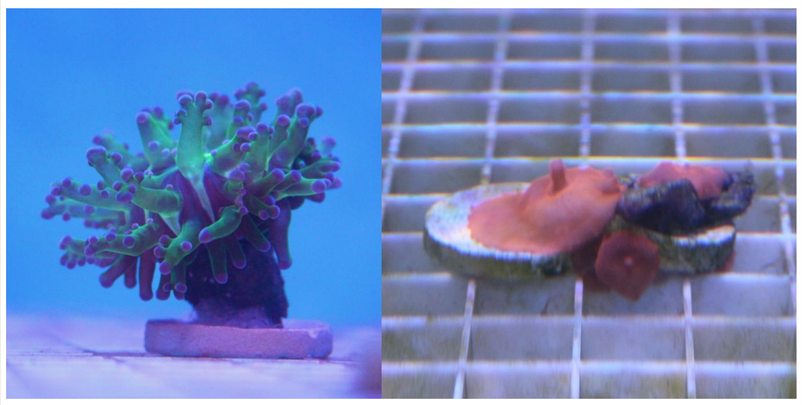

Figure 4 Two of our coral frags on fragment racks. The left photo is an LPS Green Frogspawn (*Euphyllia divisa*), and the right is a soft coral known as Orange Mushroom (*Discasoma sp.*).

With advancements in knowledge about coral biology, propagation in captivity is possible. Techniques, such as fragging, allow corals to reproduce asexually from mother colonies which are then separated into fragmentations. This reduces the need to collect wild specimens and enables scientists to study these animals without harming reefs.

Conclusions

For the different coral species currently in The Coral Farm, salinity is kept at 35 ppt, temperature remains within a range of 77-80°F, and pH stays at ~8.40. Water and light parameters are adjusted to create an ideal environment for coral growth.

Education & Research

With assistance from the SAAC team in handling corals and maintaining the system, The Coral Farm can also be used for research as well as raising public awareness about coral reef conservation. Along with student researchers, faculty can incorporate and utilize this farm for a variety of courses.