Photo credit: Mote Marine Laboratory

Coral speciman at Biosphere 2

Photo credit: Mote Marine Laboratory

Photo credit: Mote Marine Laboratory

Biosphere 2 Reef Lab

TESTING NOVEL SOLUTIONS TO RESTORE RESILIENT CORAL REEFS

We have lost nearly half of the world's reefs due to climate change. Coral reefs provide vital benefits for over a billion people around the world: food, shoreline protection, tourism economy, and irreplaceable cultural landmarks. Their degradation demands an urgent response, or we risk losing them entirely.

The Ocean at Biosphere 2—the largest experimental ocean in the world—offers the world's only facility with the capacity to accelerate reef restoration solutions.

1-million-gallon tank

Real-world complexity

Full environmental control

FUTURE OCEANS, RESILIENT REEFS

The Ocean at Biosphere 2 has the precise control of a laboratory at the scale of a complex field experiment. This unique combination of control, scale and complexity provides an opportunity to test innovative solutions for restoring resilient coral reefs before they are implemented in nature.

As such, the Ocean at Biosphere 2 offers a unique "reef lab", where scientists can adequately explore current and future environmental stressors to identify which corals are most resistant, assess interactions within novel reef communities, and test interventions for increasing reef resilience.

The Ocean at Biosphere 2 will allow us to promote the health of reef communities using probiotics, stress hardening, assisted evolution, and other novel interventions to compensate for the rapid pace of climate.

Learn more at Biosphere2.org

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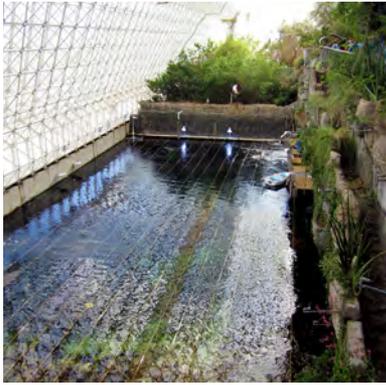
The Ocean at Biosphere 2

SELECT INFRASTRUCTURE INVESTMENTS NEEDED

Lighting Trusses $1,000,000
For 288 halogen and LED lights to supplement lighting over the reef

Control System $300,000
For manipulating carbon dioxide concentration and temperature of the water

Lab Instrumentation $250,000
For equipment that monitors water quality, chemistry, and biology of the Biosphere 2 Ocean

Sensors $100,000
For monitoring, photographing, and documenting the Biosphere 2 Ocean conditions for research and education

Raceway Corals $75,000
For initial coral colonies to conduct raceway experiments and seed the Biosphere 2 reef

Ocean and Beach Sand $50,000
For habitat development

Coral Raceway Tanks $25,000
For intermediate sized tanks ("raceways") to conduct experimental research and grow corals for Biosphere 2 reef

Invertebrates $10,000
For invertebrate herbivores (e.g., urchins, crabs, sea cucumbers, etc.) to build a diverse Biosphere 2 Ocean ecosystem

Ways to Support Our Work

A TEN-YEAR VISION

Over 40 scientists from around the world are utilizing this one-of-a-kind Reef Lab to test innovative solutions for reef restoration and resilience. Currently we are upgrading the facility with state-of-the-art engineering and equipment, closely monitoring the ecosystem, and testing natural means of rebuilding healthy coral reefs from an algae-covered, degraded state.

In the next phase, we will populate the reef with corals from real-world environments, exploring ways to engineer resilient coral reefs.

Once we have established this reef community, we will evaluate the community's response to multiple stressors designed to mimic future conditions on Earth.

This work will identify viable solutions for building reefs of the future to ensure their critical structure, function, and societal benefits for generations to come.

NAMING OPPORTUNITIES
Ocean
$5,000,000
Funds will be allocated for construction of all critical infrastructure and life support needed to maintain an experimental coral reef.

Experimental Reef Laboratory
$200,000
Funds will be used to design and maintain the space housing Biosphere 2's experimental coral raceway tanks.

Underwater Reef Viewing Gallery
$1,000,000
Funds will be used to renovate Biosphere 2's premier space for subsurface public viewing of the coral reef.

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