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.
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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**SELECT INFRASTRUCTURE INVESTMENTS NEEDED**

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<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tr>
<td>Lighting Trusses (for 288 halogen and LED lights to supplement lighting over the reef)</td>
<td>$1,000,000</td>
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<tr>
<td>Control System (for manipulating carbon dioxide concentration and temperature of the water)</td>
<td>$300,000</td>
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<tr>
<td>Lab Instrumentation (for equipment that monitors water quality, chemistry, and biology of the Biosphere 2 Ocean)</td>
<td>$250,000</td>
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<td>Sensors (for monitoring, photographing, and documenting the Biosphere 2 Ocean conditions for research and education)</td>
<td>$100,000</td>
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<td>Raceway Corals (for initial coral colonies to conduct raceway experiments and seed the Biosphere 2 reef)</td>
<td>$75,000</td>
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<td>Ocean and Beach Sand (for habitat development)</td>
<td>$50,000</td>
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<tr>
<td>Coral Raceway Tanks (for intermediate sized tanks (“raceways”) to conduct experimental research and grow corals for Biosphere 2 reef)</td>
<td>$25,000</td>
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<td>Invertebrates (for invertebrate herbivores (e.g., urchins, crabs, sea cucumbers, etc.) to build a diverse Biosphere 2 Ocean ecosystem)</td>
<td>$10,000</td>
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