



# Biosphere Foundation Overview

## Mission Statement

Biosphere Foundation's goal is to inspire intelligent use of the earth's natural resources and empower individuals to become leaders in biosphere stewardship. Biosphere Foundation (BF) achieves this objective by (1) implementing conservation programs which are community-based and sustainable; (2) restoring coral reef, mangrove and forest ecosystems, (3) creating educational programs that inspire people to care for the biosphere and get involved to make a difference; and (4) providing an unbiased, "trusted source" of data about the biosphere to users around the world.



*James Cameron, Abigail Alling & Mark Van Thillo*

*"These are the people who are the next Cousteau.  
It may seem that their work is insignificant  
– one small boat, one small team in the middle of the ocean –  
but it is not. It is the most important thing anyone can do to make a  
difference." - James Cameron, November 7, 2010*

## What Makes Biosphere Foundation's Vision Unique?

### **Our Health is Synonymous with the Health of the Biosphere**

September 26, 2016 marked 25 years since three of us (Abigail, Mark and Sierra) entered the airlock door of the Biosphere 2 Project and remained inside the 3.15-acre domed structure for two years. Biosphere 2 (BIO2) profoundly changed our lives because we experienced daily that our actions were interconnected with the health of our biosphere.

Because we lived within the confines of this miniature world sealed apart from earth's biosphere, we called ourselves "biospherians." It was a word that referred to the team of eight who lived inside BIO2 and became synonymous with the idea that human well-being is a mirror of the health of our biosphere: if our biosphere is healthy then we are healthy. This fundamental idea is true of all people on *earth* ('Biosphere 1') – in fact, we are all biospherians and interacting with our biosphere with each passing moment.

### **Everyone Can Make a Difference**

BF believes that hands-on involvement is key to stewarding the biosphere. It is wondrous to realize that no action is 'insignificant.' Everyone can make a difference and be part of the solution.

### **Ocean-Going Sailing Ship *MIR***

BF is unique in having a sailing ship to voyage the seas and remote islands of Asia working in support of coral reef, sea turtle and marine mammal research and conservation. *Mir's* homeport is located at Raffles Marina, Singapore and Banyuwedang Bay, NW Bali.



### **Community-Based Conservation**

BF works hand-in-hand with indigenous peoples to help solve environmental challenges. We are 'called to action' by the families living on shore who suffer from the decline in fisheries and not enough means to thrive in the modern world. Because each situation is different, we learn about their unique challenge and provide our expertise to empower the community to learn how to more effectively steward their land and sea.

### **Biosphere Stewardship Educational Programs & Center, NW Bali**

BF's pioneering educational program for teenagers and college students provides knowledge and skill-based tools to teach students about their bioregion in context of our larger earth's biosphere. It is our belief that

without looking at the total system with an appreciation of the interconnectedness of all life, including human health & well-being, a solution will not be effective. Thus, our educational programs address both traditional science-based learning as well as personal wilderness exploration. It is our belief that sound stewardship requires an emotional connection with the environment as well as the community that can only be achieved by working with others while experiencing both beauty and challenges in nature.



### **Climate Change**

Our purpose directly relates to climate change because it is the most significant threat impacting the health of our biosphere today. We focus on crisis points: areas where indigenous people experience the day-to-day impact of environmental devastation caused by excessive energy and resource exploitation. Our aim is to provide information, know-how and skills to make a difference to these communities while initiating low-cost programs to restore the health of the environment.

Healthy ecosystems can withstand change and adapt while those that are dead or dying will only accelerate harmful global trends. It is through such community-based conservation programs that we have joined a growing planetary network of caring individuals who have the know-how to steward our biosphere towards a healthy future.

### **Biosphere Foundation's Values**

BF's prime organizational value is sharing information. BF embodies the idea that **information** about our biosphere belongs to everyone on the planet. Providing a free trusted source of data online is central to promoting information sharing amongst governments, scientific institutions, organizations, communities and individuals.

*As an example, please see our online data and reports for 49 coral reefs studied around the world at [www.pcrf.org/science](http://www.pcrf.org/science) and our extreme finding of remote reefs in the Phoenix Islands that died due to global warming at [www.pcrf.org/phoenix.html](http://www.pcrf.org/phoenix.html).*

BF's collaborative approach provides new **inspiration** for the conservation movement: program participants, volunteers and stakeholders understand that they can make a difference and identify the contribution they make in stewarding the biosphere. Naturally, professionals find and use BF's videos and information, but our scope reaches beyond academia and into remote areas where local people are so moved by our work that they join us in the field.

*As an example, please view the "Menjangan ~ A Music Video" (a film in Bahasa Indonesia about not throwing trash in the ocean) and 'Canary is Dead,' which inspired former Vice President Al Gore to use the information in An Inconvenient Truth to highlight that coral reefs are an early warning sign of climate change. To view all these videos, please see <https://biospherefoundation.org/films/>.*

BF turns inspiration into **action** by demonstrating practical ways to protect resources and restore ecosystems. The organization reflects its values by providing online ways to make a difference; ensuring its place as a trusted source of data for scientists and conservationists; creating educational programs that are accessible to the students who will become tomorrow's activists; and through a culturally rich, hands-on collaboration with island peoples.

*As an example, please view information about our Biosphere Stewardship Education Programs at <https://biospherefoundation.org/project/biosphere-stewardship-education-programs/>.*

At the heart of Biosphere Foundation is the value that everyone can play a part in the solution. Hence our motto: "Care for the biosphere, it's ours to love."

## **Current Biosphere Foundation Programs**

### **Conservation & Environmental Stewardship Programs 2010 - Present**

Bali Barat National Park (BBNP), located in NW Bali, encompasses a variety of ecosystems including rainforest, monsoon forest/savannah, mangrove forest and coral reef. Just off the coast, yet inside the park, is Menjangan Island, a small, reef-encircled island that is sacred to Hindu Balinese and popular with tourists for diving and snorkeling. Since 2008 BF has worked with BBNP



to implement stewardship programs on land and sea, described below.

### Friends of Menjangan

To promote community participation in the future well-being of Menjangan Island and its surrounding bio-region, BF and Yayasan Dwi Asih Sejahtera (YDAS) with BBNP, implemented *Friends of Menjangan (FOM)*, a community-based conservation program. This local movement encourages all stakeholders of NW Bali – including Menjangan Island, its watershed and surrounding land - to join together in its stewardship and protection.



### Coral Reef Conservation & Restoration

In 2011, BF conducted a scientific base-line study of the reefs at and around Menjangan Island with Wildlife Conservation Society and the Indonesian Institute of Sciences (LIPI). The study indicated that coral reefs fringing the island are suffering increasingly from anchor damage, poorly managed tourism, destructive fishing practices, trash and climate change. A repeat study was conducted in 2016 with LIPI and Mr. Nono Suparno, our local partner at Friends of Menjangan. The results of this study and comparison with the 2011 study are being prepared for publication in 2018.



### Mooring Buoy Program

In 2012, the *Friends of Menjangan Mooring Buoy Program* was initiated to maintain and provide mooring buoys around Menjangan Island for local boat operators to use in order to decrease the amount of anchor damage. There are now 33 buoys off the island to support the growing number of local and international visitors to the island which we maintain year-round.

In 2016 Putri Menjangan (PM), a community-based nature forum, secured coastal land adjacent to Menjangan Island with the aim to restore its coral reef and mangrove forests. BF partnered with this organization and began a Putri Menjangan Mooring Buoy Program to install and maintain 8 buoys year-round.



### **Replanting Coral**

BF is working with our local partners at PM to replant broken coral fragments back onto the reef using local cement. There is no need to install structures or use other techniques such as electricity to grow corals, because there are so many living coral bits that are the natural basis for restoring the reef.



### **Crown of Thorns Removal**

Additionally, BF is working with both FOM and PM to remove Crown of Thorns starfish from the reefs, as well as develop simple and low-cost methods of restoring reefs. Towards this objective we have begun to work with our partners to replant broken live coral (broken by anchors, storms and destructive fishing practices) using local cement. This is an excellent way for the local people to engage in reef restoration.



### **Mangrove Forest Restoration Project**

In 2016 BF joined PM to support a mangrove seedling nursery – the first mangrove nursery to be implemented in NW Bali. BF is providing support to restore mangrove forests and is consulting with PM about using ecological methods to recycle shrimp farm wastewater using algae and mangroves.



### **Sustainable Agriculture**

In 2012, we extended our efforts to engage farmers' cooperatives to develop and demonstrate water conserving organic farming techniques, thereby increasing agricultural production and decreasing encroachment on the land and marine resources of BBNP. Additionally, we are encouraging them to use compost, no pesticides or petrochemical fertilizers and testing possible alternative crops that can be used for an economic return.



### Monsoon Forest Conservation

In 2012, a program was with Sustainable Management Group (SMG) and the Indonesian Institute of Sciences (LIPI), to address the removal of an invasive plant species, *Lantana camera*, from BBNP's monsoon forest in order to promote biodiversity of native species. Using no harmful pesticides, *Lantana* was removed from test plots and native species planted. To date these trees are growing and shading out the *Lantana* showing that restoration practices, such as this one, are possible.



### Online Geographic Information System

In 2015 a project was initiated to create a comprehensive Geographic Information System (GIS) that describes NW Bali's biological, physical and cultural resources using a simple, map-based interface. The watershed, pollution footprint, topographical and other geospatial data was gathered with local resident and stakeholders to provide a knowledge-base for better planning and management of the aquatic ecosystems for future health of the coastal region.



### Wastewater Gardens®

There is no sewage treatment in Indonesia, thus BF developed an ecological wastewater treatment system that is subsurface and uses wetland plants. Over 50 of these systems have been installed for schools, resorts and homes and most notably at Tirtagangga Water Palace, The Green School, Nikoi Resort, and the Sunrise School.



### **NW Bali Waste Management Program**

Because of the lack of waste management infrastructure, there is a growing waste management crisis in the National Park and surrounding region. Currently, plastic and other trash is burned at each household or dumped wherever it is convenient. Monsoonal rains flush much of this trash down waterways and into the ocean, where it ends up on coral reefs, in mangrove forests and littering beaches. To address this problem, BF initiated a program to reduce single-use plastic and implement a waste management program in NW Bali. Our aim is to set up the infrastructure and services for disposing of trash, composting organics, and recycling of plastic and other materials. We aim to build this comprehensive program with the National Park, the kapala desa of each village, schools, NGO's and nature groups.



### **Education Awareness and Outreach**

Our reach includes social media, videos, music videos, education programs for local schools and Earth Day and Ocean Day events. These programs have reached over 1000 students, more than 10 Balinese schools, and included the National Park, other Government officials and over 10 NGO's.



## **Biosphere Stewardship Educational Programs & Center 2011 - Present**

In 2011, BF developed its signature program to inspire students to care for and steward their biosphere. This program involves both local & international students and has been instrumental in developing other programs uniquely crafted for local Balinese, Singapore, and Chinese schools. There has been a total of 84 students who have attended these programs since 2011; 55 local (Bali and Java) and 29 international students. The students represent 12 countries: Indonesia, Singapore, Cambodia, Maldives, Sri Lanka, UK, Estonia, Japan, India, Mexico, Australia and USA/Hawaii.





During the course of the program opportunities are given for them to experience the beauty of nature; learn about ecology (including time spent in a coral reef, marsh, savannah, forest, and agriculture); review critical challenges such as climate change; explore sustainable solutions; participate in our land and sea community-based conservation programs; and join together for a series of service projects in environmental stewardship. These efforts are viewed in a global context and students are offered tools for becoming stewardship leaders as well as learn concrete ways they can make a difference upon their return home.

BF is now working towards establishing a Biosphere Stewardship Center in NW Bali to host these programs and expand them for all ages. It is our experience that there is a paucity of opportunities available to people in Asia, in particular, who all wish to learn how to steward a healthy biosphere.



### **Sailing Yacht *Mir***

The support ship for all of the above projects and headquarters for BF in The Coral Triangle is a classic 1910 sailing vessel named *Mir*. *Mir*'s home-port is at Raffles Marina, Singapore and Banyuwedang Bay, NW Bali.

### **Accomplishments**

#### **Indian Ocean Marine Mammal Sanctuary, Sri Lanka (2013 – 2016)**

In 2013, BF initiated a Marine Mammal Research & Conservation Program with the University of Ruhuna, whale-watching vessel *Raja & the Whales*, the International Fund for Animal Welfare and the University of St. Andrews to address blue whale ship-strikes along the southern coast of Sri Lanka. Research shows that 95 % of the population will be protected if the shipping lanes are moved 15 nm south. The data has been given to the Government of Sri Lanka and the International Maritime Organization with the recommendation that the shipping lanes be moved. The International Whaling Commission considers this urgent because the number of ship-strikes is threatening this endangered blue whale population.

### ***Coral Reefs: A Handbook for their Future* by Orla Doherty**

The Institute of Marine Engineering, Science & Technology published BF's book, *Coral Reefs – A Handbook for Their Future* by Former BF Director Orla Doherty. Our aim is to find interested partners who will translate this book into other languages to help communities in the Southeast Asia learn how to care for their coral reefs in the face of pollution, destructive fishing practices and global warming.

### **Sea Turtle Protection – Anambas Islands (2009 – 2011)**

Durai Island has the greatest concentration of nesting endangered green & hawksbill sea turtles in the Anambas Islands. Despite the fact that it is illegal to eat sea turtle eggs, nearly 100% of the eggs were gathered for human consumption until 2009 when BF initiated a program to make Durai beach a sea turtle protected area. BF continues to provide guidance to support the long-term sustainability of this project.

### **Coral Reef Conservation – Anambas Islands (2009 – 2011)**

BF initiated a coral reef conservation program to protect Durai Island's fringing coral reef and restore depleted fish stocks. In support of this objective, BF conducted a base-line study of Durai's coral reef in 2011 and helped secure its status as a Marine Protected Area in July of that same year.

### **Coral Reef Science**

- Google Earth Ocean Demo
- *Coral Reefs: A Handbook for their Future* by Orla Doherty, Biosphere Foundation
- Sea Turtle Protection – Anambas Islands (2009 – 2011)
- Anambas Island's Coral Reef Research and Conservation Program (2009-2011)
- Planetary Coral Reef Expedition to Map & Monitor Reefs (1991-2008) ([science.pcrf.org](http://science.pcrf.org))
- Google Earth Ocean Demo
- Immersive Media 360° Underwater Geo-referenced Reef Maps
- Coral Reef Satellite Mission Concept
- Global Warming & Coral Reefs
- Marine Parks of Indonesia Expedition (1999) with Raffles Marina

### **Ocean-Going Research Vessel**

- Continuous Operation of a Research Vessel (1991 – 2008)
- Onboard Apprenticeship Programs (Seamanship, Leadership & Outreach)
- *Join the Voyage* Internet Educational Program ([jointhevoyage.org](http://jointhevoyage.org))
- Marine Mammal & Sea Turtle Observation Program
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### **Studio of the Sea**

- Xinya Television is broadcasting *Studio of the Sea* mini-films in Hong-Kong, Singapore and China, and is utilizing its archive to produce documentaries. Included is “Canary is Dead,” a film about global warming and the fact that reefs are an indicator for the health of our oceans
- Mini-films aired on Current TV, Link TV, & World Water Expo Zaragoza Spain
- Mini-films hosted online at studioofthesea.org as well as on YouTube
- Images about global warming and reef devastation aired in *An Inconvenient Truth*

### **Wastewater Gardens®**

- Constructed over 100 ecological waste-recycling systems in Mexico, USA, Australia & Indonesia
- Designed an ecological waste-recycling system with Raffles Marina for kelongs, offshore human homes on stilts or floating platforms

### **Space Biospheres**

- Mars On Earth® - Concept to build a biospheric human habitat on Earth for a future space station on Mars
- ‘Laboratory Biosphere’ Research & Development to test life systems for the Mars On Earth® project

### **BF Fiscal sponsorship**

- Rainforest Enrichment Project & Earthwatch (2000-2007)
- Beyond Boundaries – an education-outreach leadership program (2010-Present)



*Care for the biosphere, it's ours to love.*

**[WWW.BIOSPHEREFOUNDATION.ORG](http://WWW.BIOSPHEREFOUNDATION.ORG)**