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SCIENCE HEROES

SCIENCE HERO: REEF BALL FOUNDATION

by Claudia Herrera Hudson

Coral Reefs

In addition to being one of the earth's most beautiful, colorful, vibrant, and oldest ecosystems, coral reefs serve a variety of helpful functions. Found in the clear, warm, shallow waters of tropical oceans around the world, they are incredibly diverse and productive.



Coral reefs aid in the protection of various forms of marine life, providing food and shelter to fish and invertebrates, and thus help sustain biodiversity. They are home to 1 million species; clown fish anemones, lobsters, sea turtles, seahorses, sponges, and thousands of other species call coral reef systems home.

"Clown fish live symbiotically with sea anemones. Photo credit: Andy Bruckner"

They also serve as natural buffers against storm surges, flooding waves and help stop shore erosion, thus protecting coastlines and lives and property of their inhabitants.

Thousands of communities around the world also depend on coral reefs for food, protection and economy. Reefs provide jobs both through fisheries and through tourism and recreation, such as diving tours and recreational fishing.

Coral reef plants and animals are also important to modern medicine and treatments stemming from coral reefs are being developed to treat cancer, arthritis, bacterial infections, heart disease, viruses and more, in addition to pain killers, nutritional supplements, and even commercial products.

Reefs in Danger



Yet for an ecosystem resilient enough to have survived millions of years, it is also a sensitive and unfortunately vulnerable risk from a variety of natural and human-induced factors.



Destructive dynamite fishing

natural and human threats. Weather, hurricanes and tsunamis, pollution, global warming, dynamite fishing, over-fishing are all contributing to the

degradation of these beautiful, but highly-endangered ecosystems.

Coral reefs are diminishing at alarming rates worldwide. Currently, 10% are damaged, and another 11% have already been lost, and scientists estimate that more than another 30% of them will be lost within the next three decades if they continue to decrease at this rate!

The Reef Ball Foundation

The Reef Ball Foundation strives to protect natural reef systems and to restore the world's ocean ecosystems.



Cancun Reef Balls (photo courtesy of the Reef Ball Foundation)

They do so by using innovative, earth-friendly technology. Their projects include the Reef Ball, an artificial reef that promotes reef rehabilitation,

estuary restoration, coral propagation, and public and private education. Their educational projects help raise awareness of the earth's vital ecosystems for healthy coral reef systems: why they are important, and why they need to be preserved.

Reef Balls are made of special concrete that mimics the appearance and function of natural coral reefs. They promote coral reef regrowth, coral and marine habitat restoration, and are "also used to protect beaches and to help with oyster recovery in bays and estuaries."

The Reef Ball Foundation's Reef Ball technology has garnered worldwide acclaim. So far they have put Reef Balls to use in over 50 countries in addition to creating educational projects in 14 countries.





L-R: Doug Hollingsworth, Katherine Kirbo, and Todd Barber.

MY HERO visited with the Reef Ball Foundation at the 2005 Tech Museum Awards in San Jose, California; they were being honored as an Intel Environment Laureate. The Tech Awards celebrate "innovators technology to make the world safer and healthier prosperous and just."

Todd Barber on the Reef Ball Foundation:

The Reef Ball Foundation is a company that restores coral reef systems. We go around the world. We've done 3500 reefs that we've rebuilt using a concrete and artificial reef module that we put in the ocean and plant corals on top of them, and they grow into a natural coral reef. We've done this in 50 countries and we've done over half a million Reef Balls around the world. It's our mission to restore the corals that have been damaged by man's activities.

Katherine Kirbo, Director of the Reef Ball Foundation, speaks on the importance of marine education:

Education is very important to us and Reef Ball is a great educational project to teach kids, and adults, about the importance of the ocean ecosystem. It's a great hands-on project for kids. Basically, kids will help build Reef Balls, [and] learn about marine biology. For example, one educational project [is] one in Jacksonville, Florida, in St. Augustine where all schools in the area had a competition about who could build the most Reef Balls. They deployed them off the coast of Jacksonville, after the project was completed. The kids learned about oceanography, marine biology, reef ball construction, how to get permits and grants to do the project, how to deploy them. The university donated scientists and boats, and community organizations [pitched in too]. It's a very comprehensive educational project.

Doug Hollingsworth, Director, gives a simple synopsis of



how the project works:

Reef Balls go anywhere from [one about the size of a basketball] to up to about the size of a car. We go around and drop the Reef Balls in the ocean and all the little things that grow down there want to grow on them. All the corals, the sponges, and the sea squirts, and everything else want to grow on on the Reef Balls because of the way they are made. That way, we get a coral reef growing really fast. We've got everything that wants to be on a coral reef growing on the Reef Balls, and the fish move in right away. As soon as the Reef Balls hit the bottom, 'bam!' fish move inside, and the other stuff begins to grow on them.



Purple Tube Sponges
(photo courtesy of Jim Dean)

And we also take broken coral that has been hurt in storms, and like that; we can pick it up and plant it on the outside of the Reef, way we not only save the broken coral that would have died other we also help to get the whole reef going. We have volunteers tha over the world. They dive and get in the water and get dirty and v work real hard. They swim around and collect the stuff and put th Balls in the water and that's how we help save the reefs that are over the place and being hurt. We help to keep them alive.

Is there a particular area you are currently concentrating on?

We are working in different countries around the world, but lately been concentrating a lot in tsunami-affected regions, and the Atla basin where the hurricanes have been really, really strong this ye tend to work in places where there has been damage to the reef i either natural disasters or sometimes it's from a shipwreck or gro or it can be the activities of man such as pollution or fertiliziler runc various other types of activities that can damage coral reefs.

Who are your heroes?

Todd Barber: *My heroes include [Albert Thiel](#) and [Martin Moe](#) wh some of the early pioneers of the aquarium industry that develop techniques for growing and cultivating corals.*

Kathy Kirbo: *[Thomas Jefferson](#) is my hero because he was so d and a Renaissance man. He was talented as a writer, a lawyer, h inventor, and musician, and he had a great knowledge of art. He c just about anything.*

Doug Hollingsworth *My heroes are Jacques Cousteau, Johnny and Martin Luther King. Johnny Cash was a great man who wrote good songs and cared about people. [Jacques Cousteau](#) -- I just v work for him when I was a kid. He was in the ocean all the time a where I wanted to be. And [Martin Luther King](#) helped bring every together, and that's what I think we should all be doing.*

Written by **Claudia Herrera Hudson**

RELATED LINKS

Reef Ball Foundation is an all volunteer organization restores ailing coral reefs and creates new fishing and diving sites by using Reef Balls which represent the w leading technology in designed artificial reefs.

Coral Reef Conservation Program Learn more about many ways coral reefs benefit the millions of fish, plan animals, and people who depend on them.

Deeper Blue: Reef Ball Foundation Announces Large Transplant

Dive News: The Reef Ball Foundation Begins Project Thailand. This volunteer diver post-tsunami work is de to aid in the environmental and economic recovery of 1 Phuket region.

Dive News: Thailand Post Tsunami Coral Reef Restoration Report The Reef Ball Foundation aided i post tsunami coral reef restoration by introducing 5 art reefs comprised of over 250 designed coral seeded ar reef modules, called "Reef Balls" to Butok Bay, off Rac Island in Phuket, Thailand.

EXTRA INFORMATION

This story was made possible by a grant from **Alfred P. Sloan Foundation**.

Suggest a Book

**Add an Ori
Work of**

More Featured Earthkeeper Heroes





Alan Rabinowitz started the first ever jaguar preserve.



Barry Commoner works to protect the environment and raise awareness about the danger of radio activity.



Ben Redclay was an earthkeeper whose legacy lives on through his daughter.



Ben Redclay's daughter is so energetic.



Bill Roley taught children in a Mexican orphanage how to work the land.



CCAT - CAMPUS CENTER FOR APPROPRIATE TECHNOLOGY at Humboldt State University.



Chico Mendes was a father who gave the ultimate sacrifice in defending rainforests.



Chico Mendes is involved in public...



CTxGrEn Ramani Sankaranarayanan and Geeta Vaidyanathan show remote villagers how to turn native materials into fuel for water and electricity.



David Nathan Chain was killed during a nonviolent protest to save the redwoods.



Deland Chan started an environmental group at the YMCA in New York City.



Deland Chan is an active...



Dian Fossey worked to protect the endangered Mountain Gorilla.



Dr. Elvia Niebla Soil Scientist is dedicated to soil conservation.



Dr. Richard Murphy Marine Biologist educates others about the sea and ways to protect the oceans for the future.



Dr. Richard Murphy is a professional scientist who exchanges...





Dr. Shirley McGreal founded the International Primate Protection League.



Dr. Vandana Shiva works to preserve biodiversity for the planet.



Envirofit retrofits engines to reduce pollution and enhance energy efficiency in developing countries.



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Frances Moore Lappe works to eliminate the injustices that cause hunger.



Friends of Nature: Mr. Liang Congjie is a voice for China's environment.



Friends of the Sea Lion rescue, treat, and release these mammals back into the ocean.



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Gerald Durrell established the Jersey Wildlife Preservation Trust for endangered species.



Greenpeace works globally to save the environment



Heather DeWitt is a devoted conservationist.



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Jane Goodall is an authority on wild chimpanzees.



Jean-Michel Cousteau is committed to protecting the ocean for future generations.



Jody Williams began a campaign to ban landmines.



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Joseph Ki-Zerbo



Julia Hill brought public



Kory Johnson



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Joseph N. Zerbe works to help Africans retain control of their country's agriculture.



Sandra Hill brought public attention to deforestation in California.



Rory Robinson was honored with the Goldman Environmental Prize in 1998.



Debra...



Mia Siscawati teaches people to protect their environment.

Mrs. Mei Ng: Friends of the Earth (Hong Kong) uses education to foster environmental awareness in China

Ocean Robbins helps organize young people committed to protecting the planet.

Pr...



Rachel Carson was the mother of the environmental movement.



Reef Ball Foundation restores damaged coral reef systems around the world.



Robert F. Kennedy Jr. is an eco-warrior defending the earth for future generations.



Robert...



Ryan Hreljac helps build wells for clean water in Africa.



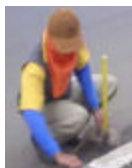
Saint Francis of Assisi was a true example of harmonious existence on Earth



Sandra Postel believes in the importance of water conservation.



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SUJANA cleans roads in Indonesia to help the environment.



Suryo Wardoyo Prawiroatmodjo educates people in Indonesia to protect the environment.



Sylvia Earle is a marine biologist and ambassador of the oceans.



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Wes Jackson was a professor who returned to the land to advance sustainable agriculture practices.



William McDonough designs buildings for ecological sustainability.



YouthCaN is a youth-run organization promoting environmental awareness through technology.

More Featured Science Heroes



Alan Turing laid the theoretical groundwork for the first computer.



Albert Einstein believed in the power of imagination.



Alexander Borodin was an accomplished chemist, composer and staunch advocate of women's rights.



Amy Charkowski works on the front lines of protecting Earth's food supply.



Andrea Mia Ghez is an astrophysicist best known for her discoveries about the black hole at the center of our galaxy.



Ariel Ruiz i Altaba Scientist - Photographer combines art and science to research how cells are generated and formed.



Augusta Ada Byron developed the world's first computer program while struggling with her own personal hardships.



Barbara McClintock a distinguished geneticist and Nobel laureate



Ben Carson is the chief of neurosurgery at Johns Hopkins University Hospital.





Beth Rickard **Environmentalist** is an advocate of solar as the energy of the future.



Charles Darwin is the father of modern biology.



Chiaki Mukai is the first female Japanese astronaut.



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Claudia Gerwin: **Keeping the Neurons Firing** researches how nerve cells relay messages to each other.



Clifford V. Johnson is a string theorist who studies the makeup of the smallest particles of the universe.



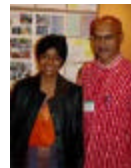
Connie Samaras has created media archives for deep space voyages.



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Cristina Diaz: **Biologist** studies intertidal and tropical sponges.



CTxGrEn Ramani Sankaranarayanan and Geeta Vaidyanathan show remote villagers how to turn native materials into fuel for water and electricity.



Dame Cicely Saunders founded the modern hospice to provide compassionate, holistic care to the dying.



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Debbye Turner became Miss America and pursued her dream to become a veterinarian.



Dilfuza Egamberdiyeva **Environmental Microbiologist** cares for the Earth's soil, researching ways to produce microbes to control plant diseases.



Dr. Alexander Langmuir Langmuir's work in epidemiology has saved millions of lives.



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Dr. Caldicott has been a lifelong anti-nuclear activist.



Dr. Edward Jenner discovered the vaccine.



Dr. Elizabeth Kalko and the Jason Project studies bats in the Panamanian rainforest.



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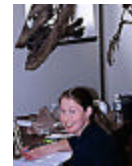
Dr. France Cordova is a renowned astrophysicist who has broken gender and cultural barriers.



Dr. Gloria WilderBrathwaite was inspired to provide health care to the poor in the inner city.



Dr. Govindappa Venkataswamy cares for the eyes of millions of people in India.



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Dr. Karen Plaut has been a pioneer in animal science research.



Dr. Kay Jamison is both an expert on, and a sufferer of, Bipolar Disorder.



Dr. Kristi Curry-Rogers is an accomplished paleontologist who travels the globe in search of dinosaur digs.



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Dr. Patch Adams gives the practice of medicine a humorous twist.



Dr. Richard Murphy Marine Biologist educates others about the sea and ways to protect the oceans for the future.



Dr. Robert Ballard and the JASON project bring scientific exploration to children around the world.



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Dr. Sara W. Lazar Neuroscientist - Meditator researches the effects of meditation on the brain.



Dr. Sue Savage-Rumbaugh is a scientist dedicated to the study and conservation of bonobos.



Dr. Susan Love is committed to women's health issues.



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Enrico Fermi was one of the 20th century's greatest physicists.



Envirofit retrofits engines to reduce pollution and enhance energy efficiency in developing countries.



Erich Jarvis observes song birds and uses his training with molecular biology to learn about brain behavior.



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Fati Kirakoya: L'Oreal-UNESCO, Women in Science Fellow is a researcher committed to helping find solutions to end the AIDS crisis.



Frederick Banting was the co-discoverer of Insulin.



Friends of the Sea Lion rescue, treat, and release these mammals back into the ocean.



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Galileo was the first to use a telescope to observe the stars and planets.



George Washington Carver is famous for experimenting with plants.



Gertrude B. Elion developed the AIDS drug, AZT.



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Grace Murray Hopper was a computer visionary.



Hazel Barton combines her passion for caving with researching microbes.



Hib Vaccine Team created an affordable, synthetic vaccine against the bacteria that can cause meningitis and pneumonia.



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Irene Curie specialized in nuclear physics, the



Jack St. Clair Kilby invented



James Burke developed a



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science of studying the nucleus of the atom.

the microchip.

model or discovery called the Knowledge Web to connect information across space and time.

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Jonas Salk discovered the polio vaccine.

Kathy Sullivan was the first American woman to walk in space.

Leonard Adleman improves lives with his work in DNA technology.

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Louis Pasteur's discoveries advanced the practice of medicine.

Luz Maria Rodriguez-Fernandez conducts cancer research to help understand the disease process.

Madame Curie received the Nobel Prize for her discovery of Radium.

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Magdalena Hurtado is an anthropologist who studies the Ache people of Paraguay.

Marie Curie discovered radioactivity as an atomic property, opening the door to 20th century science.

Meenakshi Wadhwa studies meteorites and the processes involved in their formation.

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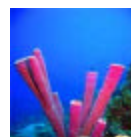


Orville and Wilbur Wright were brothers determined to build a better flying machine.

Paul Farmer has dedicated his life to treating people in the poorest nations in the world

Paul Munsen Solar Oven Man manufactures sun ovens, which harness the sun's rays to provide an environmentally safe source of energy.

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Philo T. Farnsworth, the inventor of the television.



Reef Ball Foundation restores damaged coral reef systems around the world.



Robert Koch was an important medical researcher of the 19th century.



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Saeed Awan Center for the Improvement of Working Conditions & Environment developed a new carpet loom that reduces child labor in Pakistan.



Shannon Hackett studies the genetic diversity and evolution in tropical birds.



Sir Alexander Fleming : his discovery of penicillin saved millions of lives.



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Stephanie Jenouvrier UNESCO-L'Oreal Women in Science Fellow is a population ecologist researching the effects of climate change on emperor penguins.



Stephen Hawking is a renowned theoretical physicist who writes about 'black holes'.



Tania Ruiz is an astrophysicist committed to science education and helping women reach their goals.



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Thomas Alva Edison holds the record for number of patents filed.



Tom Chau Biomedical Engineer uses science and technology to maximize opportunities for people with disabilities.



Tom Dibblee is a legendary geologic mapper.



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[Vladimir Kosma Zworykin](#) is called 'The Father of Television'.



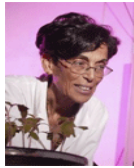
[Wes Jackson](#) was a professor who returned to the land to advance sustainable agriculture practices.



[Wilson Bentley](#) was the first person to photograph a single snowflake.



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[Zohra Ben Lakhdar](#) is a physicist from Africa who does research on atomic spectroscopy.

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