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Coral reef foundation looks toward heavens to understand the sea

JANINE WARNER

Can the latest technology help us learn more about the oldest parts of the ocean?

Next time you think you can't possibly handle the challenges of a new project in your business or nonprofit, consider the Planetary Coral Reef Foundation, and its innovative effort to harness a satellite to study the health of one of the world's most ancient habitats — the ocean's coral reefs.

Scientists already have considerable evidence that coral reefs are being destroyed by pollution, overfishing and other damage. The problem is no one knows for sure how fast they are dying, where they are being hit hardest or what the loss of these majestic living reefs means for life above and below the water.

"Coral reefs are the rain forests of the sea," said Abigail Alling, president of the Planetary Coral Reef Foundation (**www.pcrf.org**), a nonprofit environmental group that is pioneering the satellite project. "Because of satellite imagery, scientists have been able to measure the loss of rain forests around the globe. We want to do something similar for coral reefs."

Alling's experience as a marine biologist includes creating a coral reef in Biosphere 2,

Companies aiming for heavens may just improve life on Earth

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an environmental experiment in the 1990s that involved a self-contained ecosystem in the Arizona desert. "When we were in the Biosphere, we learned firsthand that the coral reef was the most dynamic indicator of the health of our world," said Alling.

But existing satellite images are not well suited to identifying life forms under the water, so the Planetary Coral Reef Foundation decided to send its own system into space to get a real picture of what's happening under the waves.

Bob Goeke, chief engineer at MIT's Center for Space Research, took on the project after attending a conference with the Planetary Coral Reef Foundation.

"We specialize in helping people who need to know about space systems to do their science," said Goeke, who has worked on projects for MIT that involved astrophysics, planetary geology and weightlessness.

"The first thing I realized is that existing satellite images are not optimized for the wavelengths they need," he said. "We're proposing to design and fabricate an instrument that will take pictures in eight very narrow wavelength bands. And from those bands we could determine the health and welfare of the coral reefs."

The idea is to send the latest in digital photography equipment into space and then make the information available over the Internet to bring attention to coral reef destruction, guide conservation efforts and influence government policies about protecting and restoring reefs.

Most of the proof-of-concept work was done in the Florida Keys, where oceanographer Phil Dustan has done extensive research since 1995.

"Between 1996 and 1999, an estimated 38 percent of the coral reefs in the Keys were destroyed," said Dustan, who was the principal investigator for the Coral Reef Monitoring Project, a multi-institutional effort to examine the status and trends of reefs in the Florida Keys for the Environmental Protection Agency.

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As part of his research, Dustan used satellite images to study coral reef cover and determined that with the right instruments in space, scientists could measure the health of reefs around the globe — something that has never been possible before.

Fundraising for the project will get underway next year.

"We know there's no guarantee that they will raise the money necessary from private sources," said Bill Mayer, associate director of MIT's Center for Space Research, and part of the team that ultimately approved MIT's participation in the project.

"We have to be careful we don't waste time on lost causes," he said, but, "We concluded there is a good probability of success in this case."

If the U.S. government did a project like this, it would cost at least half a billion dollars, Goeke said, but Planetary Coral Reef Foundation could do it for between $50 million and $75 million.

"From the time we secure the final funding, it should take about four years to launch the device into space and start collecting data," said Goeke.

Alling and her team will need a lot of support to make all this happen, but they've already attracted an impressive team of scientists, and a few angels, including Titanic's director James Cameron, who will race a sailboat off the California coast next year to defend his previous victory in another star-studded fundraiser for the project.

If you want to make a difference in the world, in your own business or nonprofit, follow the model of the Planetary Coral Reef Foundation: smart, innovative technology combined with an international approach to problem solving, and all the support you can find to make it happen.

Janine Warner is the author of several books about the Internet, including "Dreamweaver MX for Dummies."

To learn more, visit: www.janinewarner.com.