

# POPULAR SCIENCE

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## Using Virtual Reality to Avoid Catastrophe

Simulating worst-case scenarios to bring out the best in us

By [MARLENE CIMONS](#) SEPTEMBER 23, 2016

One minute, I'm standing in a conference room on the 8th floor of a downtown Washington, D.C. office building. Moments later—after putting on headgear that covers my ears and eyes—I'm underwater on a rocky reef off the coast of Naples, Italy. I'm surrounded by colorful coral, sea snails and schools of beautiful fish that swim around me. The sounds of the sea are soothing, and the sight is breathtaking.

This is my first experience in a virtual reality world, and it may be the closest I ever come to knowing what it's like to be under the sea. It's exhilarating to feel the immersive sensation of being there, despite the fact that I'm not. The narrator suggests I pretend to be a marine scientist, and start counting sea snails, which are plentiful.

But soon, the scene changes. Using special paddles that have become my virtual “hands,” I “touch” a stream of bubbles shooting up from volcanic vents on the ocean floor that are releasing carbon dioxide. Over time, carbon dioxide entering the oceans from these vents, as well as from the atmosphere, will react with water to produce carbonic acid, a noxious substance that leaves corrosion—including destroying the shells of crustaceans—wherever it goes. I look around. The reef is no longer so colorful. Brown fuzzy algae has taken over the rocks, and things look murky. Many animal species have disappeared. I can’t see any sea snails at all.

This is the ocean in the year 2100 if the world does nothing about climate change. My exhilaration turns to despair.

Which is, of course, the point.

Researchers hope to make their virtual reality “field trip” a vital conservation tool, aiming to give its “travelers” as real an experience as possible. The goal is to get people to understand in a visceral way what climate change is doing to the oceans. Rather than show them a slide show, or a video, or have them sit in front of a computer screen, virtual reality mentally transports them directly into the natural environment.

“There is an underwater calamity underway,” says Jeremy Bailenson, professor of communication at Stanford University and director of its [Virtual Human Interaction Lab](#), where this and other “expeditions” are under creation. “We can’t get everyone to read scientific papers about climate change, so this shortcuts all of that. We want people to walk out of there feeling empathy and wanting to act. It really gives you a feel for what’s going to happen if we don’t do something.”

Most people, he says, know little about ocean acidification, or mistakenly believe it has something to do with acid rain.

The aim of the project, which is sponsored by the [Gordon and Betty Moore Foundation](#), is to teach the science—show people a deteriorating ocean ecosystem and explain how their personal behavior contributes to it—and motivate them to get involved, whether in lobbying lawmakers or in reducing their own carbon footprint.

“The idea is to spur action with knowledge,” Bailenson says, stressing that programmers were adamant in making the narrative and animation scientifically valid. “We really stuck to the science.”

Earlier studies in his lab suggest that they are definitely onto something. In one [experiment](#), for example, participants took a virtual “shower” and were forced to virtually “eat” coal to get a better sense of how much

energy they use heating the water. The researchers placed water sensors in real sinks and found that after participating in the experiment, subjects who “ate” the coal used less hot water than those who were given written descriptions of how much coal they use during their showers.

Another [study](#) had its subjects cut down virtual trees. Afterwards, researchers found those who virtually cut down the trees used 20 percent less paper than those who either read a print description about cutting down trees or watched a video showing the tree-cutting process. Moreover, the effects lasted for a week after the experiment.

Bailenson believes that virtual reality can play a significant role in not only in making people more environmentally friendly, but in prompting people to save more for retirement, exercise more and feel more empathy for important social issues, such as homelessness.

In fact, another virtual reality study in his lab is doing just that: putting people inside the world of a homeless person—inside her apartment (from which she is evicted), her car (where she sleeps until the police cite her for it) and inside a bus where other homeless people sleep in three-hour stretches (until the bus reaches the end of the line—and then back again).

The homeless project, funded by the [Robert Wood Johnson Foundation](#), is trying to assess how people feel about the homeless “by putting them right into the homeless environment,” says Elise Ogle, its project manager, saying she hopes the experience will prove close to “the most powerful experience you’ve had in real life that has changed you. If you get a powerful enough experience in virtual reality, it too can change the way you think and act.”

Bailenson hopes to take his ocean acidification virtual reality experience to high schools and museums, and says he is just a few weeks away “from hitting the upload button,” and then “anyone with an HTC Vive system can have this experience. It will be free to the world.”

There is no question that my adventure under the sea was mesmerizing, even though I needed no convincing, having long been aware of the consequences of climate change. I imagine, though, that it could have a big impact on anyone who sees it, including people who still may be skeptical, or who are only just learning about what climate change is doing to the oceans.

The narration speaks to them, and to me. “All of our oceans will look like this Mediterranean reef unless we reduce our CO2 emissions. But

it's not too late...there are actions you can take to combat ocean acidification. Take steps to reduce your own carbon footprint. Keep learning about climate change and share that knowledge with others..."

Then the voice tells me to "hold your hands out in front of you." I extend the paddles. When I do, a globe suddenly rests upon my palms. "The future of our Earth is in your hands."

*Marlene Cimonis writes for [Nexus Media](#), a syndicated newswire covering climate, energy, politics, art and culture.*

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