

## Seeding the Ocean, Feeding the World

By Rachel Korr

Ask Brian Von Herzen, founder of the Climate Foundation, to describe his latest innovative tool to combat the effects of climate change, and he'll joke, "It'll be like a giant 'Slip-n-Slide' right in the middle of the ocean!"

Indeed, Von Herzen's brainchild, developed in conjunction with marine biologists at the Marine Biological Laboratory in Woods Hole, MA, does resemble that classic staple of backyard summer entertainment when unfurled in a back lot at that facility. A 90m long runner-carpet of bright yellow polystyrene, it seems ready-made for dousing with water and taking a running leap.

But this playful characterization belies a wholly serious, and remarkably optimistic, approach to ocean warming and climate change that the Climate Foundation has espoused for the past decade and carried out via tools like this one. The "permaculture platform," the giant Slip-n-Slide's real name, is slated to be deployed at a depleted zone in the Indian Ocean where it will transfer deeper, colder and more nutrient-rich water to shallower depths, thus rejuvenating that top-side water and fostering the type of healthy ecosystem that existed there until recent effects of climate change altered the area's chemistry.

Permaculture in general denotes the science of "re-seeding" swaths of the ocean that have become virtual food deserts due to rising temperatures. When behaving naturally, the ocean refreshes its stock of nutrients in its surface layers through a constant upwelling of colder, deeper, and nutrient-rich water. Vital seaweeds like kelp forests thrive and shelter marine organisms. But with increased climate change, what had once been a small layer of warmth at the surface has now permeated to greater and greater depths, suppressing this habitual upwelling process. As surface nutrients disappear, so go the seaweeds, and the smaller, and then larger, fish and other marine organisms dependent on those base food chain ingredients.

This is where Von Herzen and his team are stepping in with their prototype platform. Once situated below the turbulence of waves and passing vessels at a depth of 25m via special buoys, the platform and its tethered deep-water pump, at a further depth of 100m, will go to work recreating on a small scale what the ocean has done naturally for millennia. The wave-driven pump will send cold, nutrient-dense ocean water up through a tube and valve to be released at the level of the platform. In addition to immediately attracting fish back to the area, this new micro-environment will encourage the growth of kelp, which will anchor to the platform.

The ensuing kelp forest will attract additional marine life and foster an entire micro-ecosystem that, scaled up, would begin to replenish world fisheries, reinstating and expanding the role of fish as a sustainable global food source. That is precisely the purpose of this prototype venture: with partial funding already in the pipeline for an expansion of the project, Von Herzen and his team hope to use this first platform specifically situated in a marine food desert in the Indian Ocean to demonstrate the viability of the operation. With success in the next few months, they would immediately launch similar platforms in targeted areas near traditional fishing communities.

This low-tech, low-cost, high-yield response to one of the most prominent effects of global warming is characteristic of the Climate Foundation as a whole. In an era of increased climate anxiety, with cities and communities world-wide bracing for overwhelming effects of rising sea levels, and scientists sending

out warning calls almost daily, the Climate Foundation quietly but steadfastly advocates an optimistic, action-oriented response they believe can begin to reverse these effects while there is still time to do so.

"We prefer to use the term 'carbon-handprints' rather than focus on what can seem to be the insurmountable degree of carbon footprints already marking the planet," writes Rebecca Truman, a co-founder of the Climate Foundation, in an email.

"Carbon handprints are all of the ways we have available to us now to replenish the oceans, to sequester excess carbon, to work with local communities on sustainable aquaculture and to provide alternatives to traditional methods of crop burning that generate smothering tons of smog annually. We believe – and our science backs this up – that it is possible and incumbent upon us to act *now*, while we still have all these opportunities, and to act in a sustainable, scalable way that will involve those most affected by climate change and ultimately provide cleaner air and increased food sources globally."

These localized projects from the Climate Foundation focus on teaming with traditional aqua-farming communities to boost their production of nutrient-rich seaweeds and working with rice farmers in smog-blanketed areas of northern India to create carbon sinks from field stubble rather than burn it and send it into the atmosphere. And from the Marine Biological Laboratory to recent features by National Geographic and the Discovery Channel, researchers and those who track innovative approaches to seemingly insurmountable climate-related problems are taking note.

In their limited free time away from traveling the world to launch new, low-cost solutions to effects of climate change, both Von Herzen and Truman are dedicated, enthusiastic dancers. Could this be the secret ingredient to their continued optimism?

"As a foundation, we do seem to attract those who tilt – with solid tools in hand – at windmills, and those who want to support those doing the tilting," Von Herzen states. "And that certainly keeps everyone enthusiastic and committed to this work." At the same time – "absolutely we know when to kick back and celebrate who we are and what we're doing."

Might a gleeful, pre-deployment slide down a long, water-soaked yellow ribbon in a back parking lot be in the offing?

"Well, we are all about experimentation," Von Herzen allows, with a grin. "I wonder if we could somehow hook up that pump?"

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For more information and ways to donate to the Climate Foundation's innovative projects, including permaculture platform initiatives, go to [www.climatefoundation.org](http://www.climatefoundation.org).