

Beyond Sustainability: GreenWave's Regenerative Ocean Farm

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[Marina Leytes](#)

R. Buckminster Fuller was a founding father of systems thinking. You can [look it up](#).

And you can look up an [index of ideas](#) that honor such thinking in the roster of winners of the annual [Fuller Challenge](#), the \$100,000 award given by [The Buckminster Fuller Institute](#), which is seeking to extend the vision of the 20th-century inventor into the 21st. The challenge [looks for](#) “whole systems approaches” that incorporate “integrated, comprehensive, anticipatory strategies.”

On a rainy evening in Brooklyn, the institute gathered an eclectic crowd of entrepreneurs, scholars, designers, architects, activists, restaurateurs and chefs gathered to munch on seaweed snacks and applaud [GreenWave](#), a working kelp farm near New Haven, Conn., that is modeling ways to harvest multiple species, mitigate climate change, restore oceanic ecosystems, feed the world and, by the way, create jobs and revives local economies.

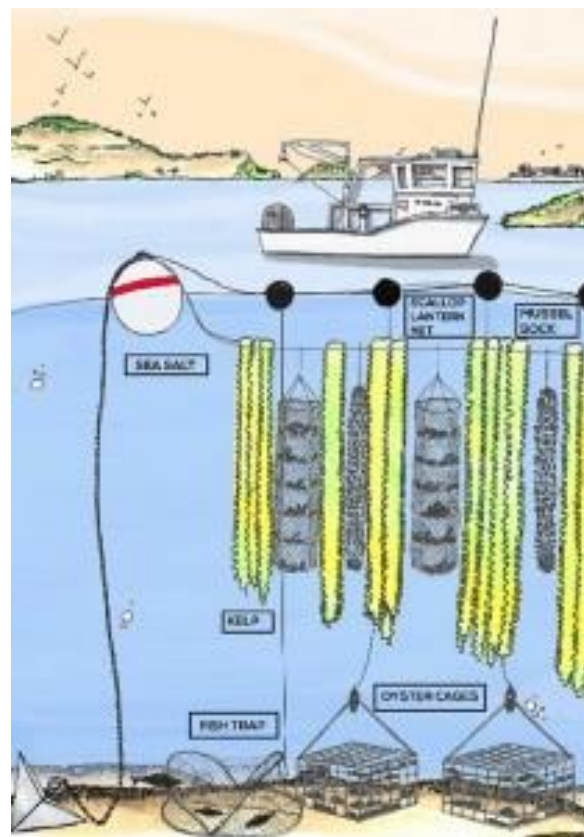
Kelp grows quickly and is highly nutritious, rich in vitamins, antioxidants and minerals. Executive director Smith says that a network of seaweed farms the size of Washington State

could feed the world. Growing oysters along with the seaweed, GreenWave addresses multiple environmental challenges without freshwater or fertilizer.

The idea is to have a small footprint and grow things that are restorative for the environment and are practical in economic terms. In GreenWave's underwater farms, kelp and mussels grow on floating ropes with oyster and clam cages below them. Thanks to their vertical structure, the farms have a low visual impact — you can't see them above the water.

A recent article in the New Yorker, "[A New Leave](#)," called kelp "the culinary equivalent of an electric car." In fact, by growing kelp and oysters, GreenWave addresses multiple environmental challenges while requiring zero inputs (no freshwater or fertilizer). The result is negative carbon footprint.

Greenwave's farms help mitigate climate change and restore ocean's ecosystems in several ways. Kelp absorbs five times as much carbon as land-based plants while oysters filter 30-50 gallons of water a day, pulling out excess nitrogen. Excess carbon and nitrogen are both extremely harmful for other ocean organisms.



GREENWAVE'S 3D OCEAN FARMING

Kelp also makes for a great fertilizer. Agricultural farms deposit nitrogen and phosphorus into the water. Kelp and oysters absorb these substances. So using kelp as a fertilizer closes the loop and brings these elements back to the farm, helping grow agricultural produce.

In addition, kelp can be used to produce biofuel. According to Smith, a network of farms totaling an area half the size of Maine could grow enough biofuel to replace all of the oil used in the US.

GreenWave's farms are not just a stand-alone solution but are designed to be replicable. Smith and his team are building a cottage industry of restorative ocean farms, scaling their ecological impact and reviving local economies. They provide new farmers with grants, seed, free Patagonia gear, training for two years and a guarantee to purchase 80 percent of the crops over five years at triple the market rate.

"I think it allows us to take the crisis of climate change and flip it into an opportunity to really innovate in sustainable ways," Smith says. "Anybody with 20 acres, a boat and \$30,000 can start a farm and be up and running within a year."

Kelp is now being sold to restaurants around the US. "The goal is to invent a new type of cuisine around thousands of ocean species," said Smith.

What will it take to make kelp a mainstream food? "Time and creativity. Kelp salads, noodles and even cocktails are already on the menu in some restaurants. And as soon as top chefs adopt it, you'll start seeing it in your local grocery stores," [said a chef friend](#) of Smith's, Dave Santos. "It's been a lot of fun exploring what you can do with this product. When you taste it, it has an al dente quality."

*ImpactAlpha's **Financing Fish** follows investors and entrepreneurs seeking opportunities in the \$390 billion seafood industry's shift towards sustainability. [Sign up](#) for the Financing Fish newsletter.*

Photo credit: Greenwave
